CITY OF SOAP LAKE

GRANT COUNTY **WASHINGTON**

GENERAL SEWER PLAN

G&O #15010
JULY 2016

Gray & Osborne, Inc.
CONSULTING ENGINEERS

CITY OF SOAP LAKE

GRANT COUNTY **WASHINGTON**

Soap Lake

GENERAL SEWER PLAN

This Plan amends the 2013 Engineering Report for facility planning purposes.

G&O #15010
JULY 2016

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COPY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

September 8, 2016

The Honorable Raymond Gravelle
City of Soap Lake
239 Second Ave. SE
PO Box 1270
Soap Lake, WA 98851

RE: City of Soap Lake - Permit No. ST0005282
General Sewer Plan

Dear Mayor Gravelle:

The Department of Ecology (Ecology) APPROVES the City of Soap Lake General Sewer Plan dated July 19, 2016. This approval is in accordance with RCW 90.48.110 and Chapter 173-240 WAC.

The City of Soap Lake (Soap Lake) must notify this office immediately of any proposed changes or revisions to the approved documents. Soap Lake must provide changes or revisions in the form of addenda, technical appendices, or supplemental reports to the original approved document to Ecology for review and approval. Additionally, Soap Lake must maintain copies of the approved engineering report, plans and specifications, operations and maintenance manual, permit, and Discharge Monitoring Reports onsite at your facility.

Ecology's review and approval of this document only assures compliance and consistency with the appropriate rules, regulations, guidelines, planning and design criteria, terms of any loan agreement, and/or other similar documents and is not a quality control check. Soap Lake should not consider this approval as satisfying other applicable federal, state or local statutes, ordinances or regulations.

Please contact Lucy Peterschmidt at (509) 329-3408 if you have any questions or need additional information about this approval.

Sincerely,

James M. Bellatty
Section Manager
Water Quality Program

JMB:DW:jab
cc: Kimberly Prisock, Ecology/Eastern Region
Cynthia Wall, Ecology/Eastern Region
Robert Scott, Gray & Osborne

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

September 6, 2016

The Honorable Raymond Gravelle
City of Soap Lake
PO Box 1270
Soap Lake, WA 98851

RE: SERP Submittal: City of Soap Lake, Sewer Capital Improvement
WQC-2015-S0aLak-00020

Dear Mayor Gravelle:

In accordance with RCW 90.50A and Chapter 173-98 WAC, and based on the documentation provided, the Department of Ecology (Ecology) has determined that the City of Soap Lake's (City) Sewer Capital Improvements comply with Ecology's State Environmental Review Process (SERP). Any significant changes to the project made after the date of this concurrence may require additional environmental review of the project.

Additionally, Ecology requires approval of the sewer plan before the City will be eligible to submit a financial assistance application for the above referenced project.

Nothing in this approval shall be construed as satisfying other applicable federal, state or local statutes, ordinances or regulations.

If you have any questions, please contact Cynthia Wall, Project Manager, at (509) 329-3537.

Sincerely,

James M. Bellatty
Water Quality Section Manager
Eastern Regional Office

Enclosure: SERP checklist
cc: Cynthia Wall, Ecology/WQP/
David Dunn, Ecology/WQP/FMS
Liz Ellis, Ecology/WQP/FMS
Nancy Wetch, Grey & Osborne

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EXECUTIVE SUMMARY

The objectives of this General Sewer Plan for the City of Soap Lake are to evaluate the conditions and capacity of the existing wastewater collection and treatment systems and to identify improvements needed to meet the demands of the City's 6- and 20-year planning periods. This plan has been coordinated with planning efforts conducted previously, including the City of Soap Lake Comprehensive Sewer Plan (HCWA, 1999) and the Engineering Report (G&O, 2013), and is consistent with planning guidelines identified by the State's Growth Management Act. This Plan amends the 2013 Engineering Report to meet facility planning requirements for funding purposes.

PLANNING

The population within the City's UGA, estimated at 1,543 in 2016, is expected to grow at a maximum rate of 1.5 percent per year (2006 Grant County Comprehensive Plan Update) through 2035 to a population of 2,047. Although this is the maximum rate of projected growth used for planning purposes, recent census data indicates that the City has decreased in population since 2000. The City anticipates that the majority of future growth will occur in the western and northern parts of the City.

CAPITAL IMPROVEMENTS

An evaluation of the City's existing wastewater collection system identified no capacity deficiencies that currently need to be addressed. Video evaluation revealed that some sewer pipes have physically deteriorated and should be replaced. Video evaluation was completed on 13 percent of the City's sewer pipe, with preference given to sewer pipe under roadways planned to be improved as part of the City's Transportation Improvement Program. An evaluation of the City's existing wastewater treatment facility was performed in the Engineering Report, and the findings of that report are summarized herein. Brief discussion regarding the feasibility of providing service to the Lakeview and Lakeview Heights Developments is included. In order to legally provide sewer service, the City would need to annex these developments into the City's Urban Growth Area. The costs for identified improvements, which are more fully described in Chapter 4 and Chapter 5, are also summarized in Table ES-1 and Table ES-2.

Six-year improvements have been identified for sewer mains that require replacement within the 20-year planning period and are located under roadways that will be improved within 6 years. The remaining improvements are identified as necessary within 20 years. It is likely that additional sewer mains will require improvement in the future; therefore, additional sewer video inspection of the remainder of the system and sewer main replacement equal to 20 percent of the collection system are included in the 20-year capital improvement plan.

The City completed a comprehensive analysis of the WWTF in the Engineering Report, and although subsequent flows, loadings, and review of growth projections may have changed the timeline for when various improvements may be necessary, the recommendations in that report have not changed. Due to the recent completion of the Phase I improvements, it is not likely that the City will desire to complete another project within the next six years. Furthermore, as addressed previously, the City has not grown at the rate that was previously projected, and it may be possible to delay the completion of the Phase II improvements as a result.

TABLE ES-1

6-Year Capital Improvement Costs(1) (2016 Costs)

Description	2016 Cost
New 8-Inch Sewer from MH C-67 to MH C-62 along 3rd Ave NE	$260,000
New 8-Inch Sewer from MH A-2 to MH A-4 along Lakeshore Drive	$226,000
New 8-Inch Sewer from MH A-6 to MH A-7 along Fir Street	$116,000
New 8-Inch Sewer from MH A-26 to MH A-36 along Main Street West	$260,000
6-Year Total:	**$862,000**

(1) Project costs include mobilization, 25 percent contingency, sales tax, design and construction administration

TABLE ES-2

20-Year Capital Improvement Costs(1) (2016 Costs)

Description	2016 Cost
New 10-Inch Sewer from MH B-34 to MH B-40 along SR 17	$143,000
New 8-Inch Sewer from MH C-10 to MH C-12 along East Beach Park	$147,000
New 8-Inch Sewer from MH A-7 to MH A-10/ New 12-Inch Sewer from MH A-13 to Lift Station 2 along 1st Ave NW	$457,000
Video Evaluation of Collection System	$200,000
Additional Sewer Main Replacement	$4,200,000
Wastewater Treatment Facility Upgrades, Phase II	$1,534,000
Sewer Jet Truck	$100,000
Total:	**$6,781,000**
6-Year and 20-Year Total:	**$7,643,000**

(1) Project costs include mobilization, 25 percent contingency, sales tax, design and construction administration

FINANCING

The financing plan, which is discussed in more detail in Chapter 6, indicates that the City must increase revenues generated from sewer service fees by approximately 3.2 percent each year over the next five years to pay for all improvements identified for the 6-year planning period and to address inflation. Chapter 6 also identifies potential funding sources, including grants and loans, available for sewer system improvements.

CHAPTER 1

INTRODUCTION

PURPOSE

The purpose of this General Sewer Plan (Plan) is to evaluate the City's existing wastewater collection and transmission system and identify areas where improvements are needed or will be needed within the 6- and 20-year planning periods. Because growth is projected for the City of Soap Lake over the 20-year planning period, planning for that growth will be essential to properly accommodate new customers within current and future service area boundaries. It is also important to survey the existing wastewater collection and treatment infrastructure to determine system capacity and capability to serve the projected population, as well as replacement needs required over the planning period.

This Plan has been prepared in accordance with the provisions of the Washington Administrative Code (WAC) Section 173-240-050, General Sewer Plan. Development of the Plan has been coordinated with the City's Engineering Report (2013, Gray & Osborne, Inc.), Comprehensive Sewer Plan (1999, Hammond Collier Wade Livingstone), and Water System Plan (2012, Gray & Osborne, Inc.). This General Sewer Plan updates the City's 1999 Comprehensive Sewer Plan and amends the 2013 Engineering Report to meet facility planning requirement for funding purposes

SCOPE

This plan is intended to be feasible in terms of engineering, economic, regulatory, and political frameworks. Included are conceptual designs and cost estimates for recommended improvements to the City's wastewater treatment facility and collection and transmission system, a proposed implementation timeline, and a financing plan. The plan is organized into the following chapters:

CHAPTER 1 – INTRODUCTION

This chapter contains descriptions of the purpose and scope of the plan, a historic perspective of the City's wastewater collection and treatment systems, and a summary of previous planning reports that address issues that have affected the wastewater collection and treatment systems in the past.

CHAPTER 2 – PLANNING

In this chapter, a discussion of general planning issues, including the Growth Management Act, water quality planning, planning period, service areas, land use and

zoning, service area population, projected growth rates, and environmental elements is presented.

CHAPTER 3 – EXISTING FACILITIES

This chapter describes the existing wastewater collection system, including pressure and gravity sewers, and sewage lift stations. The City's existing water and wastewater facilities are also discussed, as well as wastewater characteristics, infiltration and inflow and operation and maintenance practices.

CHAPTER 4 – COLLECTION SYSTEM EVALUATION

This chapter evaluates the existing wastewater collection system, discusses ERUs, wastewater flows and drainage basins, and analyzes existing collection/transmission system capacity.

This chapter also describes the potential impacts of wastewater flows, wastewater collection/transmission system expansion requirements, and recommended improvements for the 6-year and 20-year planning periods.

CHAPTER 5 – WASTEWATER TREATMENT FACILITIES

This chapter provides a history and description of the existing wastewater treatment facilities, including permit requirements, capacity analysis, and the recommended improvements for the 6-year and 20-year planning periods.

CHAPTER 6 – CAPITAL IMPROVEMENT PLAN

This chapter provides an analysis of existing sewer service rates and connections charges, the financial status of the sewer utility, capital improvement program, and funding source alternatives for the recommended improvements.

HISTORY

OWNERSHIP, OPERATION, AND MAINTENANCE

The City of Soap Lake owns, operates, and maintains the wastewater collection system and wastewater treatment facility.

CITY OF SOAP LAKE WASTEWATER COLLECTION SYSTEM

The City of Soap Lake's original wastewater collection system was constructed in the late 1940s and consisted of a system of trunks and laterals that served the present downtown area. Original sanitary sewer trunk and laterals were constructed using

concrete and vitrified clay pipe with a mastic joint compound. Two lift stations served the original sanitary sewer system. Lift Station 1 was constructed in the late 1940s at the North end of Canna Street, perpendicular to the alley between 1st Ave NE and 2nd Ave NE. This lift station was constructed to pump sewage from developed areas in the eastern half of the City into Lift Station 2 by way of 900 LF of 8-inch force main. Lift Station 2 was also constructed in the late 1940s at the north end of Dogwood Street by the beach. This lift station was constructed to pump sewage from the western half of the town to the wastewater treatment facility by way of 3,000 LF of 8-inch force main.

Major expansion and replacement of the wastewater collection system took place in the 1970s and 1980s. PVC pipe was used exclusively for the 5,700 LF of collection system expansions and improvements.

The City also owns and operates a limited storm sewer system which serves the central business district and discharges into Soap Lake.

CITY OF SOAP LAKE WASTEWATER TREATMENT FACILITY

The City's wastewater treatment facility (WWTF) is located in the southwest corner of the City. The treatment facility was initially constructed in 1946 to provide primary treatment to the City's wastewater before discharging it to the adjacent sprayfield. The facility has been upgraded three times, in 1978, 2004, and 2015. Detailed discussion of the history and upgrades to the WWTF is provided in Chapter 5.

The 2013 Engineering Report identified two phases of improvements to the WWTF. The improvements completed in 2015 were Phase I of those improvements. Phase II improvements identified in the Engineering Report are recommended to begin construction depending on the rate of growth in the City. These improvements will include the following:

- Modification of the influent sampler
- Bioselectors
- Anoxic basin
- Paint Secondary Clarifier 1
- Secondary clarifier splitter box
- Additional sludge drying beds
- Installation of a floating aerator in the oxidation ditch
- Floating decanter in the aerobic digester
- Nonpotable water system
- Additional effluent pump

PREVIOUS PLANNING

Several reports have been written over the years to address problems associated with the wastewater collection and treatment systems. Following is a summary of these reports:

1998 City of Soap Lake Wastewater Treatment Facilities Engineering Report, by Hammond, Collier & Wade-Livingstone Associates, Inc. The purpose of this report was to evaluate the WWTF for current and future design loadings, and prepare for improvements at the wastewater treatment facility.

1999 City of Soap Lake Comprehensive Sewer Plan, by Hammond, Collier & Wade-Livingstone Associates, Inc. The purpose of this plan was to present an engineering evaluation of all of the components of the Soap Lake's sewer collection system.

2001 City of Soap Lake Predesign Report for Wastewater Treatment Plant Improvements, by Wilson Engineering. This document sized and outlined proposed improvements.

2004 City of Soap Lake Operation and Maintenance Manual for the Wastewater Treatment Plant, by Wilson Engineering. This manual explained the City's treatment process operations.

2012 Water System Plan, by Gray & Osborne, Inc. The purpose of this plan was to evaluate the performance and adequacy of the City's existing water supply and distribution system and outline the City's requirements to meet the demands of the 6- and 20-year planning periods.

2013 Engineering Report, by Gray & Osborne, Inc. The purpose of this plan was to provide a 20-year plan for maintaining adequate capacity at the City's WWTF.

2015 WWTF Record Drawings, by Gray & Osborne, Inc. The purpose of these drawings was to document the improvements included in the 2014 treatment facility upgrades.

CHAPTER 2

PLANNING

INTRODUCTION

The configuration of a wastewater collection and treatment system is influenced by development trends and timing, regulatory requirements, growth considerations, and topography. This chapter will discuss planning efforts that affect wastewater collection and treatment, sewage service areas, land use and zoning, projected growth rates during the planning period for each service area, and environmental factors within the service areas.

LOCATION

The City of Soap Lake was incorporated in July 1919. The City is located five miles north of Ephrata, Washington, at the southern end of the Grand Coulee. The City is 180 miles east of Seattle, 115 miles west of Spokane, 52 miles south of Grand Coulee, and 100 miles north of Pasco. A vicinity map for the surrounding area is shown in Figure 2-1.

The main topographic feature of the area, and the one that the City derives its economic livelihood from, is Soap Lake, a lake containing minerals that are therapeutic in nature. Tourists are drawn to Soap Lake to vacation and take advantage of the mineral baths available at the hotels and motels. The economy of the City is oriented towards summer tourism, although many people have retired to Soap Lake due to the mild, dry climate.

The City of Soap Lake has a mayor and City Council form of government. The City owns and operates the municipal sewer collection system and the wastewater treatment facility (WWTF), which discharges to groundwater by infiltration of effluent into the soil. The collection system serves the residents and businesses within the city limits.

PLANNING PERIOD

The wastewater system is in need of periodic evaluation and improvement to continue to provide wastewater services for existing customers and to serve future growth. The planning period for the wastewater utility evaluations should be long enough to be useful for an extended period, but not impractical. The 6- and 20- year planning periods for this Plan extend through 2021 and 2035, respectively.

SERVICE AREA

The City of Soap Lake is subject to the State Growth Management Act, which requires cities to plan their growth, avoiding inefficient land use. Figure 2-2 delineates the corporate limits of the City and the Urban Growth Area (UGA). City utilities and services may be gradually expanded into the UGA as needed. The City's corporate limits encompass an area of approximately 1.3 square miles, while the UGA boundary encompasses an area of approximately 1.8 square miles.

EXISTING SERVICE AREA

The current sewer service area, shown on Figure 2-2, is the area served by the existing sewer collection system within the city limits.

The City currently provides sewage collection and treatment for all residents within the corporate limits that are not currently on septic. Since completion of the 1999 Comprehensive Sewer Plan, the City's urban growth area (UGA) has expanded significantly to the north along SR-17.

Currently, the City's existing sewer service area is comprised of approximately 11.5 miles of gravity sewer mains, approximately 0.7 miles of force mains, and two sewage lift stations. A more detailed description of the City's sewer service area is provided in Chapter 4. A map showing the City's existing wastewater collection system is presented on Figure 2-3.

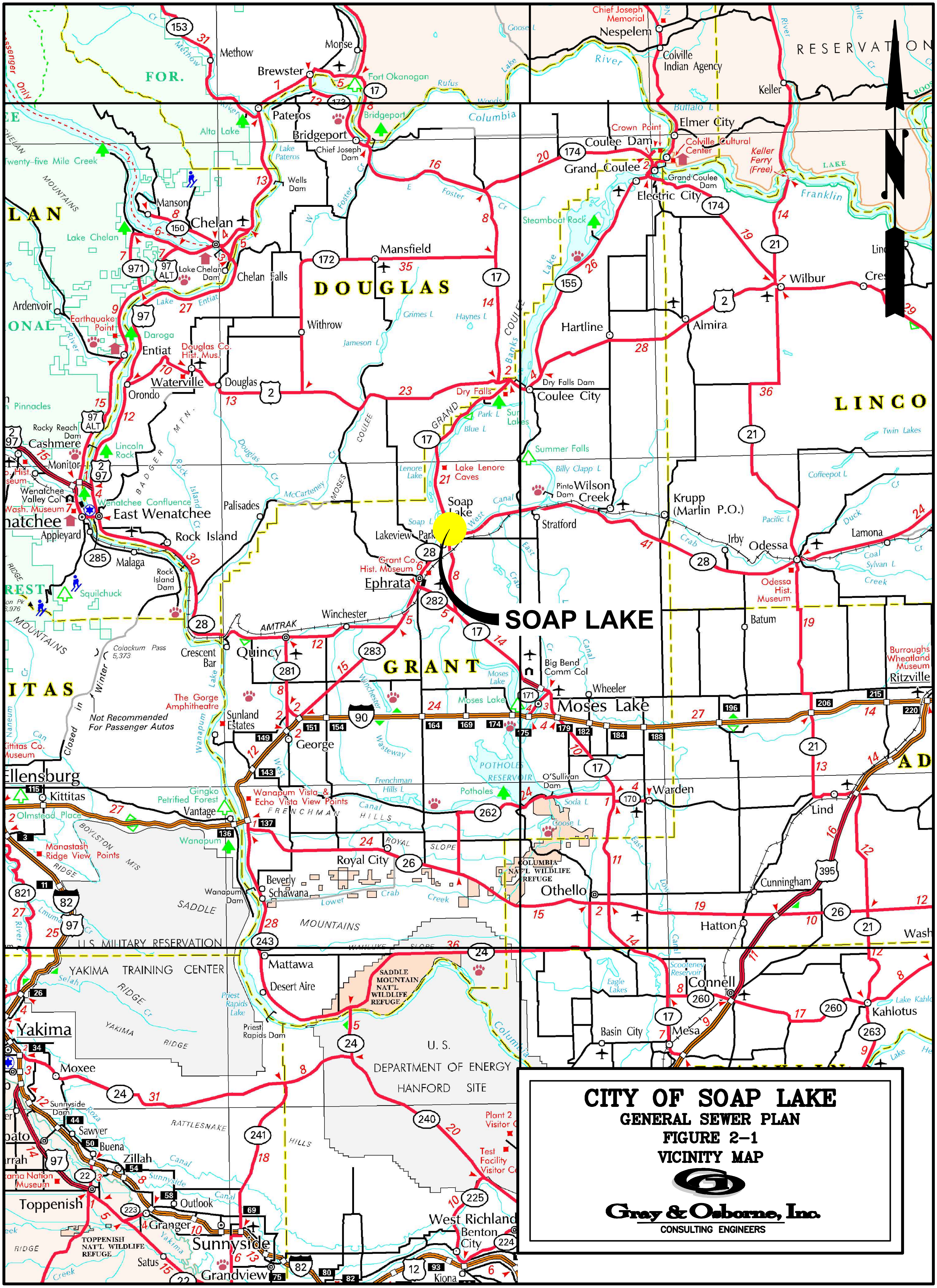
Undeveloped platted land exists within the city limits. No sewer main is currently installed in the undeveloped platted land. If these locations are developed, it is the developer's responsibility to install and connect sewer main.

FUTURE SERVICE AREA

It is anticipated that the City's future service area will consist of the area within the existing corporate limits as well as areas of new residential and commercial development outside the corporate limits that are within the City's UGA. The City's service area will also expand as existing residential areas elect or are required to convert from on-site septic systems to City sewer. It is estimated that approximately 18 to 20 houses within the UGA use on-site septic systems.

LAND USE AND ZONING

The City of Soap Lake has identified seven land use codes within its corporate limits and UGA as shown in Table 2-1. The land use designations are each intended to allow flexibility in the development of each area, and to recognize that the City contains several distinct neighborhoods, each with a different character.



CITY OF SOAP LAKE
GENERAL SEWER PLAN
FIGURE 2-1
VICINITY MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

SR 17 TO
GRAND COULEE

SOAP LAKE

LIFT
STATION
NO. 2

LIFT
STATION
NO. 1

LS

CITY
HALL

WASTEWATER
TREATMENT
FACILITY

LAKEVIEW
HEIGHTS

LAKEVIEW

SR 28 TO
EPHRATA

SR 17 TO
MOSES LAKE

1" = 1500'

LEGEND

CITY LIMITS

UGA

SEWER MAIN

MANHOLE

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 2-2

EXISTING SEWER SERVICE AREA

Gray & Osborne, Inc.
CONSULTING ENGINEERS

SOAP LAKE

LAKE SHORE DR

3RD AVE NW

5TH ST

MAIN ST W

LIFT STATION NO. 2

LIFT STATION NO. 1

1ST AVE NE

MAIN AVE

2ND AVE SE

2ND AVE SW

3RD AVE SE

4TH AVE SE

4TH PL

5TH AVE SE

6TH AVE SE

7TH AVE SE

8TH AVE SE

4TH AVE NE

3RD AVE NE

2ND AVE NE

1ST AVE NE

WARD ST

WOODLAND ST

SCENIC DR

MAPLE ST

JUNIPER ST

HEMLOCK ST

GINKGO ST

FIR ST

EVERGREEN ST

DOGWOOD ST

CHERRY ST

BIRCH ST

ASH ST

DIVISION ST N

DIVISION ST S

ASTER ST S

BUTTERCUP ST S

CANNA ST N

CANNA ST S

SR 17

ELDER ST N

ELDER ST S

FERN ST N

FERN ST S

GLADIOLA ST N

GLADIOLA ST S

EASTLAKE AVE

2ND PL SE

3RD PL SE

CITY HALL

WASTEWATER TREATMENT FACILITY

SR 28

LAKEMORE DR

1" = 600'

LEGEND

- CITY LIMITS
- UGA
- 6" SEWER
- 8" SEWER
- 10" SEWER
- 12" SEWER
- "X" SEWER
- FORCEMAIN
- MANHOLE
- MANHOLE NO. X-XX

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 2-3

EXISTING COLLECTION SYSTEM

Gray & Osborne, Inc.

CONSULTING ENGINEERS

TABLE 2-1

Existing Land Use(1)

Land Use Designation	Area (sq. mi.)	Percent of Total Area
R-1 Residential	0.34	27%
R-2 Multiple Dwelling	0.27	21%
R-3 Permanent Mobile	0.15	12%
R-4 Trailer Courts and Camps	0.02	1%
C-1 1st Class Commercial	0.05	4%
C-2 2nd Class Commercial	0.05	4%
M-1 Industrial	0.09	7%
City Right-of-Way	0.30	24%
Totals	**1.30**	**100**%

(1) Per City of Soap Lake Land Use Designations Map (see Figure 2-4).

The area between the current city limits and the UGA boundary is envisioned as a buffer zone between the urban land uses within the city limits and the rural land uses in the surrounding areas of Grant County. City services such as water and sewer could eventually be extended to this buffer zone as individual properties are annexed.

In general, existing land uses within the City corporate limits correspond to the zoning districts presented in Figure 2-4. Businesses are primarily located in the eastern area of central Soap Lake. Residential neighborhoods are generally located along the lake and in the western part of the City.

SERVICE AREA POPULATION

EXISTING POPULATION

The population of the City of Soap Lake has grown since its incorporation in 1919. The City experienced its greatest growth between 1930 and 1950, when the population increased at annual rates up to 12 percent. This was due to the nearby construction of Grand Coulee Dam during the 1930's, and then the transition to the expansion of the Columbia Basin Project as an agricultural base took root. Growth has varied over the years, with occasional periods of net population loss, but has remained relatively stable since 2001. Table 2-2 provides historical population trends for the City between 1930 and 2014.

TABLE 2-2

Historical Population

Year	Population	Population Change	Average Percent Change/Year
1930(1)	282	--	--
1940(1)	662	380	9%
1950(1)	2,091	1429	12%
1960(1)	1,591	-500	-3%
1970(1)	1,064	-527	-4%
1980(1)	1,196	132	1%
1990(1)	1,203	7	0%
2000(1)	1,733	530	4%
2001(2)	1,706	-27	-2%
2002(2)	1,654	-52	-3%
2003(2)	1,650	-4	0%
2004(2)	1,624	-26	-2%
2005(2)	1,599	-25	-2%
2006(2)	1,575	-24	-2%
2007(2)	1,557	-18	-1%
2008(2)	1,546	-11	-1%
2009(2)	1,538	-8	-1%
2010(1)	1,514	-24	-2%
2011(2)	1,515	1	0%
2012(2)	1,520	5	0%
2013(2)	1,530	10	1%
2014(2)	1,530	0	0%
2015(2)	1,520	-10	-1%

(1) Source: Washington State OFM, from U.S. Census Data
(2) Source: Washington State OFM, from U.S. Intercensal Estimate Data

PROJECTED CITY POPULATION AND ANNUAL GROWTH RATE

The City's future service area population is projected to grow at an annual growth rate of 1.5 percent, consistent with the 2006 Grant County Comprehensive Plan Update. However, the City's 2009 Comprehensive Plan Update cautions that while the County's growth rate represents the highest rate allowed under the Growth Management Act, that rate may not reflect true growth rates within Soap Lake. As shown in Table 2-2, the population has gradually declined since the year 2000. Consequently, the City plans to monitor actual growth rate during the planning period, and to make adjustments if

SOAP LAKE

CITY HALL

1" = 1500'

LEGEND

- URBAN GROWTH BOUNDARY
- CORPORATE LIMITS
- R-1 RESIDENTIAL
- R-2 MULTIPLE DWELLING
- R-3 PERMANENT MOBILE
- R-4 TRAILER COURTS AND CAMPS
- C-1 1ST CLASS COMMERCIAL
- C-2 2ND CLASS COMMERCIAL
- M-1 INDUSTRIAL

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 2-4

CURRENT LAND USE DESIGNATIONS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

necessary. Table 2-3 provides future population projections using a growth rate of 1.5 percent annually.

TABLE 2-3

Projected Population

Year	Projected Population
2016	1,543
2017	1,566
2018	1,590
2019	1,613
2020	1,638
2021(1)	1,662
2035(2)	2,047

(1) 6-year planning period
(2) 20-year planning period

In general, the City anticipates the majority of future growth will occur in the western and northern parts of the City within the city limits and the UGA. Downtown Soap Lake and east Soap Lake are generally built out, and growth in these areas is expected as infill only.

ENVIRONMENTAL FACTORS

Various natural features of the service area are discussed below, such as topography, soils, climate and precipitation, critical areas, wetlands, and flood hazard areas. Much of the following information is excerpted from the City's 1999 Comprehensive Sewer Plan and the Soil Survey of Grant County, Washington.

AREA TOPOGRAPHY

Soap Lake is located within the broad flood plain of the prehistoric Columbia River Channel. At the northernmost point of this plain, the water flow excavated a deep pocket from the basalt which created the water body known as Soap Lake. The topography of the City is mostly flat land that is bordered by steep cliffs to the northeast and northwest. The native vegetation is mainly grasses and shrubs. The topography ranges from 1,080 feet along the lake, to about 1,200 feet above sea level at the east and west ends of the City.

LOCAL SOILS AND GEOLOGY

Recent construction on Main Street and Division Avenue indicated the presence of solid rock at depths that can impact utility construction and increase cost of open-trench excavation.

The soils in the Soap Lake Area were formed in glaciofluvial deposits, loess, lacustrine deposits, eolian sand colluvium from basalt and grandodiorite, glacial till, organic materials, and recent alluvium. Catastrophic floods of glacial melt water from Glacial Lake Missoula, 13,000 to 20,000 years ago, are the major source of glacial outwash deposits of sand and gravel in the area. The floods were diverted southward across the Columbia Plateau when glacial ice dammed the Columbia River. Ice dams storing great volumes of water in Glacial Lake Missoula repeatedly were breached by overflow from the lake. There probably were at least seven successive floods resulting from the busting of ice dams, five of which crossed the Columbia Plateau.

It has been postulated that the loess that blankets the hills has a complex origin. The primary deposit was airborne. Local ponding, intermittent streamflow and sheetwash have played a secondary role in re-working and re-depositing the loess. The loess mantle on hills in the northern part of Grant County is predominantly 5-40 feet thick.

During Pliocene time, the rising of Horse Heaven Hills reduced the gradient of the Columbia River Tributary streams. This reduced gradient resulted in deposition of the Ringold Formation. The Ringold Formation is considered to represent a period of sedimentation continuing beyond the emission of the latest basalt flows. The sediment that accumulated prior to the emission of the latest basalt flows is known as the Ellensburg Formation.

During the Pliocene and early Pleistocene, the Cascade Range was uplifted, causing a gradual shift from semi-humid to semi-arid climate. The drier climate is recorded in the gradual increase in calcareousness and cementation of the Ringold surface. Post-glacial, or Holocene, modifications of the landscape include localized deposition of alluvium. Saltese soils formed in remains of plants with a minor amount of alluvium. They formed in areas where the ground water levels tend to fluctuate within the soil, allowing periodic aerobic decomposition of organic material.

Soils in Soap Lake are grouped generally as Adkins very fine sandy loam, 5-10 percent slopes. This very deep, well-drained soil is on hills and is formed in loess. Soils are further broken down into the following soil types. The most prevalent soil type in the city limits of Soap Lake is Kennewick fine, sandy loam, with slopes of 5 percent or less. This soil is deep and well drained with a moderate infiltration rate. The second most prevalent is Kennewick silt-loam, with slopes of 5-10 percent. This soil is also deep and well-drained and has a moderately low infiltration rate. Other soil groups include Umapine silt-loam, a deep, well-drained soil made up to glacial till and typically containing discontinuous lime and silica lenses less than 1/8” thick. Permeability through Umapine

silt-loam is moderate through soil and moderately slow through the lenses. Also present is the Schawana complex on 0-15 percent slopes. This soil type is made up of loamy fine sand, and cobbly loamy fine sand.

Quincy loamy fine sand, 0-15 percent slopes, can also be found here, and is a deep, somewhat excessively drained, soil located on dunes and terraces. Permeability is rapid, available water capacity is low and runoff is slow and therefore the hazard of soil erosion is slight, however the hazard of soil blowing is high. Kennewick silt loam 0-2 percent slopes and 2-5 percent slopes, can also be found within the limits of Soap Lake. These are well-drained, very deep soils with moderately slow permeability with a high water capacity. The final large group of soil is Warden silt-loam, 0-2 percent slopes. This is a very deep, well-drained soil with a moderate permeability and a high water capacity. (Source: Soil Survey of Grant County, WA).

CLIMATE AND PRECIPITATION

The climate in the Soap Lake area is influenced to a great extent by the Cascade Range and the Rocky Mountains. The Rocky Mountains shield the county from the more severe winter storms moving southward across Canada, while the Cascade Range forms a barrier to the early movement of moist air from over the ocean; however some of the air from each of these sources reaches Soap Lake.

In Soap Lake, summers are hot, and the ground is frequently covered with snow in the winters. The average annual precipitation is about 7 inches, with precipitation in summer falling mainly as showers, with occasional thunderstorms. Chinook winds, which blow downslope and are warm and dry, often melt and evaporate the snow. (Source: Soil Survey of Grant County, WA).

The average annual temperature is about 50°F, and the average frost-free season is about 165 days.

CRITICAL AREAS

The Growth Management Act has required the City of Soap Lake to designate and protect Critical Areas and Resource Lands. As the cost to remedy the loss of resource lands or critical areas is greater than conserving and protecting them from loss or degradation, the City has designated lands as resource and critical areas. Natural Resource lands are defined by the Growth Management Act as Agricultural Lands, Forest Lands, and Mineral Resource Lands. There are no forest or mineral lands in the City of Soap Lake or the UGA. Although agriculture is a large sector of the Grant County economy, no agricultural lands of long term significance were identified within the Soap Lake UGA.

Aquifer recharge areas, that serve to recharge potable water and which are highly vulnerable to contamination from intensive land uses, are also included in critical areas.

Critical aquifer areas include, but are not limited to, areas of soils with rapid permeability and the presence of potential sources of contamination. Discharge to the groundwater of the City shall not contribute contaminants nor facilitate degradation of recharge areas. The location of aquifer recharge areas is especially pertinent to the City's sewer system in that treated wastewater is currently disposed of by land application. The potential impacts to groundwater sources may create necessary modifications to the treatment process detailed in Chapter 5.

Critical Areas are defined as including the following areas and ecosystems: (a) wetlands; (b) fish and wildlife habitat conservation areas; and (c) flood hazard areas. A brief discussion on these critical areas follows.

Wetlands

Wetlands are generally areas where water covers soil, or is present either at or near the surface of the soil, at a frequency and duration sufficient to support plant and animal communities adapted for life in saturated soil conditions. The U.S. Fish and Wildlife Service's National Wetlands Inventory shows that no wetlands are present within the vicinity of Soap Lake; the only body of water present is Soap Lake.

Fish and Wildlife Habitat

Fish and wildlife habitat is defined as areas which meet the definition of a "Fish and Wildlife Habitat Critical Area" pursuant to WAC 365-190-080(5) and is essential for maintaining specifically listed species in suitable habitats. Any proposed activity within 300 feet of these areas requires that a habitat assessment be prepared. This assessment is then circulated to the appropriate agencies for review. After review, a Habitat Management Plan may be required to address the project's impacts, provide background information of specific species and recommend protection and mitigation measures for those species. After implementation, an assessment and evaluation of the success of those measures is required. This plan is again circulated to the appropriate agencies for review. Minimum buffers from the critical habitat area may be required.

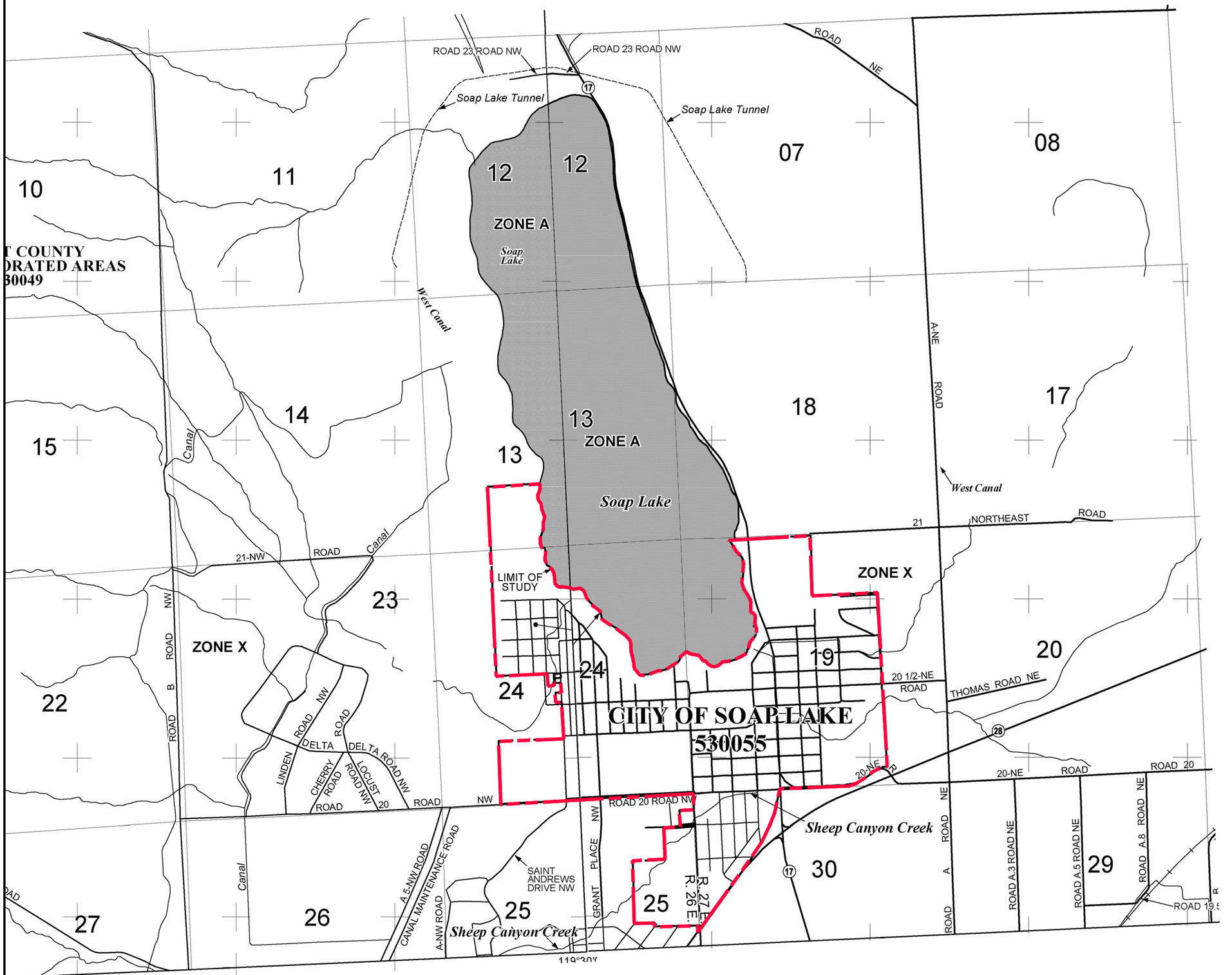
No fish and wildlife habitat critical areas are noted in the vicinity of Soap Lake.

Flood Hazard Areas

Flood hazard areas are areas adjacent to lakes, rivers, and streams that are prone to flooding during peak runoff periods. Flood hazard areas deserve special attention due to the sensitive nature of their ecosystems as well as the potential for damage to structures located in the floodplain. Information on flood hazard areas can be found on the Grant County, WA and Incorporated Areas Flood Insurance Rate Maps (FIRM). The maps applicable to the City of Soap Lake are Community-Panel Numbers 53025C0800C, 53025C0550C, and 53025C0525C, all effective February 18, 2009, developed by the

Federal Emergency Management Agency (FEMA). These flood maps are shown in Figure 2-5.

Construction of buildings and other development in these areas is regulated in accordance with the County's flood hazard construction standards. Typically, new construction in flood hazard areas is not allowed or is limited to specific activities. Allowed activities might be mining or gravel extraction, recreational uses, repair to existing structures, utility and road construction or uses dependent upon water such as docks, wharves, and boating activities.



1" = 1500'

CITY LIMITS

ZONE A: SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

ZONE X: AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 2-5

FEMA FLOOD MAPS

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CHAPTER 3

EXISTING FACILITIES

INTRODUCTION

The City of Soap Lake owns and operates an oxidation ditch wastewater treatment facility (WWTF) and a sewage collection system. The WWTF was upgraded to the oxidation ditch system in 1978 from a trickling filter system. The exact age of the sewage collection system is unknown, although the City believes initial construction began in the late 1940s. Sewage collection facilities expanded as the City developed throughout the years. This chapter describes the existing facilities that are relevant to the City of Soap Lake's wastewater collection and treatment systems. These facilities include the wastewater collection system, lift stations, and WWTF.

COLLECTION SYSTEM

PRESSURE AND GRAVITY SEWERS

The City's wastewater collection system includes approximately 11.5 miles of gravity sewer mains, approximately 0.7 miles of force mains, two sewage lift stations, and associated telemetry.

The City's original wastewater collection system served the present-day downtown area south of the Lake and was constructed of concrete and vitrified clay pipe and a mastic joint compound in the late 1940s. The collection system was extended to include the surrounding developed areas. Sewer pipelines in these areas were also constructed of concrete. In the 1970s and 1980s, approximately 5,700 LF of PVC pipe was used to expand the collection system and replace deteriorated pipes.

Recent replacement of the wastewater collection system began in 2010 as the City encountered frequent problem areas. In 2010, 800 LF of sewer main under Main Avenue West from Ash Street to Cherry Street was replaced with 8-inch PVC sanitary sewer pipe. In 2014, 3,200 LF of sewer main under Main Avenue from SR 17 to Division Street and on Division Street from Main Avenue to 2nd Avenue was replaced with 8-inch PVC sanitary sewer pipe.

A map of the existing sanitary sewer system is shown on Figure 2-3. This figure shows the approximate pipe sizes and locations of sanitary sewer collection lines located throughout the City. Inventories of the gravity sewer lines and force mains are provided in Table 3-1.

TABLE 3-1

Collection System Pipe Inventory

Pipe Diameter	Length, ft.
Gravity Sewer Pipe	
6-inch	23,150
8-inch	32,430
10-inch	3,130
12-inch	2,230
Total	**60,940**
Force Main Pipe	
8-inch	3,900
Total	**3,900**

(1) Collection system pipe inventory taken from Figure 2-3.

SEWAGE LIFT STATIONS

Lift Station 1

Lift Station 1 was constructed in the late 1940s at the North end of Canna Street, perpendicular to the alley between 1st Ave NE and 2nd Ave NE. This lift station was constructed to lift sewage from developed areas in the eastern half of the City into Lift Station 2 by way of 900 LF of 8-inch force main (see Figure 2-3). The lift station was upgraded in 1977, which consisted of (2) 10 HP pumps with a rated capacity of 320 gpm each. The upgrade included piping modifications necessary to bypass and abandon the existing station. The new installation was a package duplex system with the pumps and motors mounted above the wet well. In 2009, new control panel switches were installed to replace the old mercury switches.

This lift station provides sanitary sewer service for the eastern half of the City (Drainage Area "A", see Figure 3-1) which consists of the Main Avenue Subbasin, the Canna Street Subbasin, and a majority of the Daisy Street Subbasin. Sewage within this part of Soap Lake is collected into trunk lines in each subbasin (see Figure 3-2) which are then fed into Lift Station 1. The Daisy Street trunk line is 10-inch; all other trunk lines are 8-inch.

Lift Station 2

Lift Station 2, also constructed in the late 1940s, is located at the north end of Dogwood Street by the beach. This lift station was constructed to lift sewage from the western half of the town up to the WWTF by way of 3,000 LF of 8-inch force main. The lift station was upgraded in 1977, which consisted of a retrofit to the existing structure and the installation of a package duplex pump system. Both pumps and motors were below ground in a dry well installation. Two 25 HP pumps, with capacities of 465 gpm each,

1" = 1200'

SOAP LAKE

LIFT STATION NO. 2

LIFT STATION NO. 1

DRAINAGE AREA "A" FLOW TO LIFT STATION NO 1

DRAINAGE AREA "B" FLOW TO LIFT STATION NO 2

WASTEWATER TREATMENT FACILITY

CITY HALL

LAKEVIEW HEIGHTS

LAKEVIEW DEVELOPMENT

FUTURE DRAINAGE AREA "C" DIRECT FLOW TO TREATMENT PLANT

URBAN GROWTH AREA (CANNOT PROVIDE SERVICE OUTSIDE UGA)

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 3-1

COLLECTION SYSTEM BASINS

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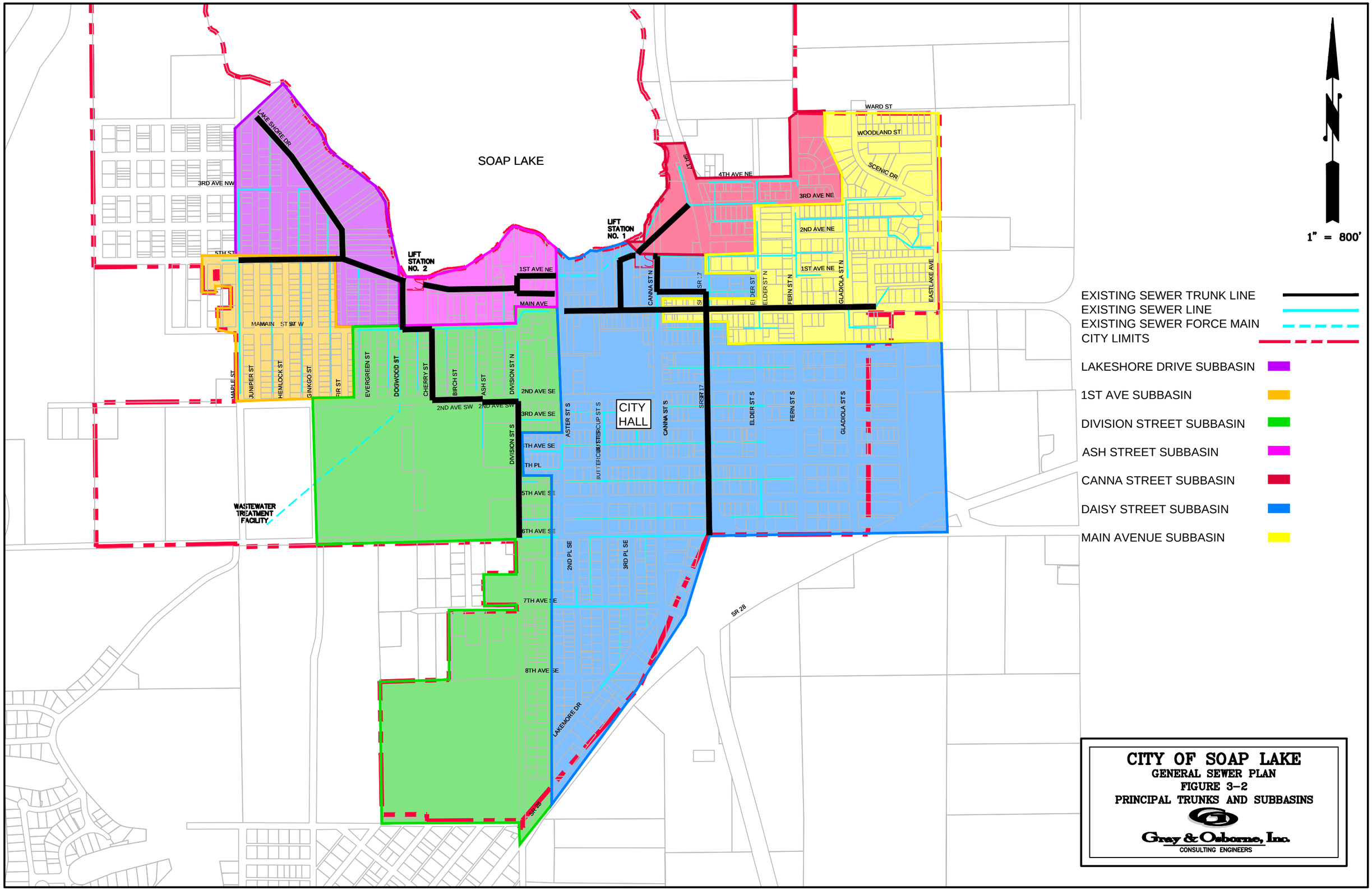

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 3-2

PRINCIPAL TRUNKS AND SUBBASINS

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were installed. This submersible lift station now serves as a backup to the new Lift Station 2.

In 2009, the submersible lift station was replaced with a self-priming, above-ground Smith and Loveless style pump station. In the event of an emergency, the lift station is automatically supplied with power from a generator located at Lift Station 1. The lift station is equipped with an automatic dialer system that contacts City personnel with alarm notifications. The submersible pump station is still available for emergency use. The submersible pump station and the current above-ground lift station are rated for the same flows.

This lift station provides sanitary sewer service for the western half of the City (Drainage Area "B") which consists of the Lakeshore Drive Subbasin, the 1st Avenue Subbasin, the Ash Street Subbasin, and the Division Street Subbasin. Sewage within this part of Soap Lake is collected into trunk lines in each subbasin (see Figure 3-2) which are then fed into Lift Station 2. The Ash Street trunk line is 12-inch; all other trunk lines are 8-inch.

Specific characteristics of the City's lift stations are shown in Table 3-2 below.

TABLE 3-2

Sewage Lift Stations

Parameter	**Lift Station 1**	**Lift Station 2**
Location	North end of Canna Street	North end of Dogwood Street
Drainage Basin	A	B
Year Constructed/Upgraded	1940/1977/2009	1940/1977/2009
No. of Pumps	2	2
Manufacturer	Smith & Loveless	Smith & Loveless
Model Number	4B2B, Suction	4C3
Pump Type	Vacuum Primed Non-Clog	Self-Priming Centrifugal
Rated Flow, gpm	320	465(1)
Rated Head, ft.	50	120(1)
Motor Horsepower, hp	10	25(1)
Wet Well Volume (gal):		
To High Water Alarm	350	560(2)
To Overflow	2,740	2,690(2)

(1) The submersible lift station and the above-ground lift station which replaced it are each rated for this capacity.

(2) These are the reported volumes for the submersible pump station as listed in the 1999 Comprehensive Sewer Plan.

WATER AND WASTEWATER TREATMENT FACILITIES

An overview of the City's water and wastewater treatment facilities follows.

WATER SYSTEM

The healing powers of Soap Lake's mineral water were well-known to Native Americans long before Lewis and Clark arrived. The area's development as a healing center and resort destination for American settlers began at the turn of the 20th century with the arrival of the railroad. During this period, several sanitariums were built to treat patients with Beurger's disease, psoriasis, and other skin, circulatory, and digestive ailments. A separate mineral water distribution system, still partially intact today, was constructed to make the lake's healing water available to several facilities.

The City's original water system consisted of the original Well 1, a small distribution system, and a 300,000 gallon concrete reservoir. Records do not clearly indicate when these facilities were constructed. The City's current Well 1 was drilled in 1940 and is located approximately 50 feet south of the original Well 1. The original well was decommissioned in 1958. Well 2 was drilled in 1952, and has been taken out of service because of its proximity to the City's wastewater treatment facility.

In 1974, the City constructed a 500,000 gallon welded steel reservoir on the east side of the City. At that time, the City had plans to remove the original 300,000 gallon reservoir, but funding to do so was not available. However, that reservoir was disconnected from the City's distribution system. The City constructed the 500,000 gallon bolted steel reservoir and Well 3 in 1996. Both are still in use. Well 2 was taken out of service at that time. Figure 3-3 shows the City of Soap Lake's current water system and facilities. The nearest City well is about 2,400 feet from the WWTF.

WASTEWATER TREATMENT FACILITY

The City of Soap Lake has provided facilities for the treatment of wastewater from residential, commercial, and industrial sources since the late 1940s. As described in Chapter 1, the City wastewater treatment facilities have undergone many expansions and upgrades since original construction. These modifications have been in response to an increasing population and to meet continually more stringent discharge limitations. Upgrades recommended to meet future demands are discussed in Chapter 5.

The City's WWTF is located in the southwestern corner of the City, on the edge of the current city limits. The influent to the WWTF is pumped from Lift Station 2 to the WWTF, where it flows through the headworks prior to discharge to the oxidation ditch. Liquids flow from the oxidation ditch to the secondary clarifiers, then to the chlorine contact chamber, and then are pumped to the rapid infiltration basins for disposal in conformity with the City's State Waste Discharge Permit. Solids from the secondary

SOAP LAKE

WELL NO.3

WELL NO.2 (INACTIVE)

WEST RESERVOIR

WWTF

WELL NO.1

CITY HALL

BOOSTER STATION

EAST RESERVOIR

UPPER PRESSURE ZONE

MAIN PRESSURE ZONE

1" = 700'

LEGEND

CITY LIMITS	
UGA	
PRESSURE BOUNDARY	
4" WATER	
6" WATER	
8" WATER	
WELL	W
BOOSTER PUMP STATION	B
RESERVOIR	R

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 3-3

EXISTING WATER SYSTEM

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CONSULTING ENGINEERS

clarifiers are pumped to the aerobic digester and subsequently discharged to the sludge drying beds. Chapter 5 describes the City's WWTF in more detail.

REGIONALIZATION

The closest development is Lakeview Park, a suburban development with a population of approximately 700, with each lot utilizing individual septic tanks. In order to provide sewer service to this area, the City would need to expand its urban growth area to include Lakeview Park. The additional sewage from this area would require the City to invest in additional improvements to the WWTF and the collection system.

There are only a few cities within 20 miles of the City. Fifteen miles to the southeast is the City of Moses Lake and 5 miles to the southwest is the City of Ephrata. Both cities are served by their own wastewater treatment facilities. The City does not believe regionalization with any of these communities is feasible or likely.

WASTEWATER CHARACTERISTICS

The primary source of flow to Soap Lake's WWTF is from domestic sources. The domestic sewer system includes all residential, school, and commercial hookups. The City does not currently serve any major industrial dischargers.

As discussed in Chapter 1, the City's sewer system has undergone numerous upgrades over the years to enable its treatment facilities to maintain compliance with State regulations. Although the population within Soap Lake's service area has fluctuated, the characteristics of the wastewater have remained the same. The design criteria for the most recent upgrades and the current State Waste Discharge (SWD) permit limits are shown in Table 3-3 and Table 3-4, respectively.

TABLE 3-3

WWTF Design Criteria

Parameter	Design Criteria
Average Annual Flow	0.26 MGD
Maximum Monthly Flow	0.32 MGD
Maximum Month Biochemical Oxygen Demand (BOD_5)	641 lbs/day
Maximum Month Total Suspended Solids (TSS)	661 lbs/day

TABLE 3-4

State Waste Discharge Permit Final Effluent Limits

Parameter	Basis of Limit	Average Monthly Limit (1)	Average Weekly Limit	Maximum Daily Limit
Flow	Technology(2)	0.30 MGD	N/A	0.42 MGD
Biochemical Oxygen Demand (5-Day)	Technology(2)	30 mg/L, or 85% removal of influent loading(lb/day)	45 mg/L	N/A
Total Suspended Solids	Technology(2)	30 mg/L, or 85% removal of influent loading(lb/day)	45 mg/L	N/A
Total Nitrogen(3)	Water Quality	10 mg/L	N/A	N/A

(1) Average monthly effluent limitations are based on the arithmetic mean of the samples taken.
(2) Based on facility design.
(3) Total nitrogen is defined as the sum of Total Kjeldahl Nitrogen (TKN) plus nitrate and nitrite.

INFILTRATION AND INFLOW

Infiltration and inflow are generally defined as non-sewage flows that enter the wastewater collection and treatment system. A discussion of each is presented below.

INFILTRATION

Infiltration is defined as groundwater that enters a sewer system through defective pipes and side sewers, pipe joints and manhole walls. The infiltration rate is relatively constant day to day, although it may vary seasonally if the local ground water elevation fluctuates. Infiltration can be a constant problem, increasing daily operations costs for the collection and conveyance systems. Infiltration demands additional capacity in the collection system and at the WWTF.

Infiltration has not been a significant problem for the City historically because groundwater in the vicinity of Soap Lake is managed by the Soap Lake Protective Works (Protective Works). The principal components of the Protective Works are the FMX wellfield and the INY wellfield. These wellfields each consist of three pumping wells in a manifold to a discharge header which discharges to the Bureau of Reclamation West Canal to supplement the irrigation water supply for the Columbia Basin Project. The purpose of the Protective Works is to maintain the level of Soap Lake and to prevent groundwater from diluting or otherwise modifying the unique water chemistry of Soap Lake.

INFLOW

Inflow is defined as surface water or runoff that enters the collection system through constructed openings, such as manhole covers, cross connections with storm sewers and combined sewers or direct connections such as yard, basement, or roof drains. Inflow is directly related to rainfall or flooding events and results in an immediate increase in sewage flows following the event. Inflow is an intermittent problem, causing an increase in sewage flows following the triggering event. A system carrying a substantial amount of inflow must have sufficient capacity to carry the maximum flow rate without surcharging and backing up into customers' basements. At the WWTF, inflow from storm water requires peak flow capacity sufficient to handle major storm events. Besides storm water, inflow may also be attributed to building drains, groundwater collection systems, or cooling water flows from refrigeration equipment. These types of inflow require additional average flow capacity at the WWTF.

The City of Soap Lake has a limited storm sewer system that serves its central business district. This storm sewer system is located adjacent to portions of the existing sanitary sewer system and may contribute to increased flow at the WWTF following storm events if leaks or cross connections are present. Other sources of possible inflow include roof drains, parking lot drains, leaky manhole lids, and industrial floor drain connections.

INFILTRATION AND INFLOW EVALUATION

Infiltration and inflow, (I/I) are undesirable because they produce flow that would ordinarily not require treatment that reduces the design life of the sanitary sewer system and the WWTF. If quantities are small enough, the WWTF may have sufficient capacity to treat infiltration and inflow, and both may be tolerated. However, as the sewer system and WWTF approach their design capacities, it becomes worthwhile to evaluate the cost of reducing infiltration and inflow versus the cost of adding more conveyance or treatment capacity.

As identified in the Engineering Report, I/I has not been a major issue for the City. According to the report, between 2005-2009, a total annual average daily flow of 0.19 MGD consisted of 0.12 MGD of base sewage flow and 0.07 MGD of I/I.

OPERATION AND MAINTENANCE

The following section summarizes the City's primary operation and maintenance activities.

GRAVITY SEWER AND MANHOLES

The major maintenance activities with respect to gravity sewers and manholes are periodic inspections and flushing. The older portions of the City's sewer collection system are given special attention because the potential for breaks in sewer lines or accumulated solids is higher in these areas. The deterioration of the older areas within the sewer collection system are tracked through the City's maintenance records.

Video inspection plays an important role in maintaining the City's gravity sewer lines and allows for an overall assessment of the integrity of the pipe and provides valuable data with respect to rehabilitation project prioritization. Documentation of the internal inspection is recorded on videotape for review and analysis and as a historical record. Structural problems in the collection system may include collapsed pipes, cracked pipes with or without deflection, pipe sags, cracked or open joints, holes in pipes, root intrusion, signs of pipe corrosion, protruding joint material, protruding lateral sewers, pipes with excessive debris, and side sewers with active I/I. The City does not perform video inspections on a regular basis, but it is recommended that the City budget for these services more often to ensure that problem areas are identified early enough to avoid failures.

SEWER VIDEO EVALUATION

The most recent video inspection was performed in July of 2015. Approximately 7,335 lineal feet of sewer pipe were videoed; this equates to about 13 percent of the wastewater collection system. The lines selected for video review were chosen because they have been noted as problem areas by City staff or because the City plans to improve the roadway in the near future. It is recommended that the City perform additional sewer video evaluation of nearby sections as replacement projects are planned. Table 3-5 below shows the results of the 2015 video evaluation. Nearly 40 percent of the sewer pipe videoed was determined to be in fair condition, and nearly 20 percent was determined to be in poor condition. It is assumed that in the remaining system, 40 percent is in fair condition and 20 percent is in poor condition. "Good" condition means that no notable issues or signs of deterioration were present. "Fair" condition means that some issues such as aggregate exposure, offset joints, or root intrusions were present, but the pipe does not need to be replaced immediately. "Poor" condition means that significant issues such as aggregate exposure, missing pieces of pipe, cracks, and severely offset joints were present, and the City should schedule replacement within the 6-year planning period. Figure 3-4 shows which sewer lines were videoed and the condition of each pipe.

SOAP LAKE

LAKE SHORE DR

3RD AVE NW

5TH ST

LIFT STATION NO. 2

LS

LIFT STATION NO. 1

LS

1ST AVE NE

MAIN AVE

MAIN ST W

MAPLE ST

JUNIPER ST

HEMLOCK ST

GINKGO ST

FIR ST

EVERGREEN ST

DOGWOOD ST

CHERRY ST

BIRCH ST

ASH ST

DIVISION ST N

2ND AVE SE

2ND AVE SW

3RD AVE SE

4TH AVE SE

4TH PL

5TH AVE SE

6TH AVE SE

7TH AVE SE

8TH AVE SE

DIVISION ST S

ASTER ST S

BUTTERCUP ST S

2ND PL SE

3RD PL SE

CITY HALL

LAKEMORE DR

WASTEWATER TREATMENT FACILITY

F F F F F

SR 17

CANNA ST N

SR 17

ELDER ST N

FERN ST N

GLADIOLA ST N

EASTLAKE AVE

WARD ST

WOODLAND ST

SCENIC DR

4TH AVE NE

3RD AVE NE

2ND AVE NE

1ST AVE NE

CANNA ST S

SR 17

ELDER ST S

FERN ST S

GLADIOLA ST S

SR 28

1" = 600'

LEGEND

- CITY LIMITS
- UGA
- GOOD CONDITION
- FAIR CONDITION
- POOR CONDITION
- NOT EVALUATED
- FORCEMAIN F
- MANHOLE

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 3-4

SEWER VIDEO RESULTS

Gray & Osborne, Inc.

CONSULTING ENGINEERS

TABLE 3-5

Sewer Video Evaluation

Begin MH	Ending MH	Location	Pipe Material	Pipe Size	Pipe Length (ft)	Conclusions (great, good, fair, poor ratings)
A1	A2	Lakeshore Drive	Concrete	8"	200	good condition
A2	A3	Lakeshore Drive	Concrete	8"	425	fair condition, severe aggregate exposure, lots of small root intrusions
A3	A4	Lakeshore Drive	Concrete	8"	250	fair condition, severe aggregate exposure, lots of small root intrusions
A4	A5	Lakeshore Drive	Concrete	8"	225	good condition
A5	A6	Lakeshore Drive	Concrete	8"	240	good condition
A6	A7	Fir Street	Concrete	8"	270	poor condition, severe aggregate exposure, large cracks and broken sections of pipe - recommend replacement
A7	A8	Field north of Fir St/Evergreen St	Concrete	8"	160	fair condition, severe aggregate exposure, curves in pipe, offset joints
A8	A9	Field north of Evergreen St	Concrete	8"	290	fair condition, severe aggregate exposure, lots of small root intrusions, concrete patches in roof of pipe
A10	A9	Field north of Evergreen St/Dogwood St	Concrete	8"	150	fair condition, severe aggregate exposure, root intrusions at joints - some large, SS protruding
A12	A11	West Beach Park/1st Ave NW	Concrete	12"	525	fair condition, many pipe bends and offset joints at east end of pipe
A13	A12	1st Ave NW	Concrete	12"	125	fair condition, moderate aggregate exposure, large root intrusions, steep descent at east end of pipe
A15	A13	Division St N	Concrete	12"	100	good condition
A16	A15	1st Ave NE	Concrete	12"	360	good condition
A26	A31	Main Ave W	Clay	8"	280	fair condition, clay has some cracks, at least one large root intrusion with smaller ones at joints
A34	A31	Main Ave W	Clay	8"	275	good condition
A38	A34	Main Ave W	Clay	8"	275	poor condition, clay is cracking and large pieces have already fallen out, more to come soon - recommend first priority replacement
B27	B29	SR 17/Daisy St S	Concrete	10"	340	good condition
B29	C20	SR 17/Daisy St S	Concrete	10"	370	good condition

Begin MH	Ending MH	Location	Pipe Material	Pipe Size	Pipe Length (ft)	Conclusions (great, good, fair, poor ratings)
B34	B27	SR 17/Daisy St S	Concrete	10"	350	good condition
B40	B34	SR 17/Daisy St S	Concrete	10"	350	fair condition, severe aggregate exposure, several large grout chunks sitting in pipe
B44	B40	SR 17/Daisy St S	Concrete	10"	160	good condition
C11	C10	East Beach Park	Concrete	8"	290	fair condition, severe aggregate exposure, some offset joints, sharp pipe bend at 198 ft
C11	C12	East Beach Park	Concrete	8"	120	good condition
C20	C17	SR 17/Daisy St S	Concrete	10"	375	good condition
C63	C62	3rd Ave NE	Concrete /Cast Iron	6"	250	poor condition, cast iron section severely corroded, most joints offset
C66	C63	3rd Ave NE	Concrete	6"	400	poor condition, severe aggregate exposure, root intrusions, cracks, and several offset joints
C66	C67	3rd Ave NE	Concrete	6"	180	poor condition, severe aggregate exposure, large root intrusions filling pipe, some cracks
Good condition		2,955 ft	42%			
Fair Condition		2,845 ft	39%			
Poor Condition		1,375 ft	19%			
Total		7,335 ft	100%			

LIFT STATIONS AND FORCE MAINS

The major maintenance activities for lift stations are periodic inspections, cleaning and pump servicing. Lift station components, including the wet well, dry pit, pumps, rails, level detection equipment, lifting chain, piping, valves, and control panels are visually inspected with to ensure structural integrity and proper operation. Pumps and electrical equipment are inspected and maintained as per the manufacturer's recommendations. Visual inspection of the wet well is performed during pump on and pump off intervals to insure proper function of pumps, valves and level detection equipment.

Force mains are periodically pigged as necessary to remove build-up or other obstructions that may have occurred. Records for any operations and maintenance activities are maintained for future reference.

CHAPTER 4

COLLECTION SYSTEM EVALUATION

INTRODUCTION

Adequate design of wastewater collection facilities requires a determination of the quantity of wastewater generated from each of the contributing sources. Typically, wastewater is predominantly domestic in origin with lesser amounts contributed by commercial and industrial businesses and by public use facilities such as schools, parks, hospitals, and municipal functions.

DEFINITION OF TERMS

In this chapter, the existing wastewater flows for the service areas will be analyzed and projections made for future conditions. The terms and abbreviations used in the analysis are described below.

WASTEWATER

Wastewater is water-carried waste from residential, business and public use facilities, together with quantities of groundwater and surface water which enter the sewer system through defective piping and direct surface water inlets. The total wastewater flow is quantitatively expressed in millions of gallons per day (MGD).

RESIDENTIAL WASTEWATER/EQUIVALENT RESIDENTIAL UNITS (ERUS)

Residential wastewater is wastewater generated from single and multi-family residences, permanent mobile home courts, and group housing facilities such as nursing homes. Residential wastewater flow is generally expressed as a unit flow based on the average contribution from each person per day, or gallons per capita per day (gpcd). Flow from an average single-family residential unit is termed an equivalent residential unit (ERU).

COMMERCIAL WASTEWATER

Commercial wastewater is wastewater generated from business activities, such as restaurants, retail and wholesale stores, service stations, and office buildings. Commercial wastewater quantities are expressed in this plan in terms of ERUs.

AVERAGE ANNUAL FLOW (AAF)

Average annual flow (AAF) is the average daily flow over a calendar year and is determined by dividing the total yearly flow by the number of days in the year. The unit quantity is expressed in MGD.

MAXIMUM MONTH FLOW

Maximum month flow (MMF) is the highest monthly flow during a calendar year. This flow is composed of the normal domestic, commercial, and public use flows with possible significant contributions from inflow and infiltration. The predicted maximum month flow at the end of the design period is used as the design flow for sizing treatment processes and selecting treatment equipment. The unit quantity is expressed in MGD.

PEAK HOUR FLOW (PHF)

Peak hour flow (PHF) is the highest hourly flow during a calendar year. The peak hour flow often occurs in response to a significant storm event preceded by prolonged periods of rainfall which have previously developed a high groundwater table in the service area. Peak hour flows are used in sizing the hydraulic capacity of wastewater collection, treatment processes, and pumping components. Peak hour flow is typically determined from treatment facility flow records and projected future flows. The unit quantity is expressed in terms of gallons per minute (gpm).

DETERMINATION OF ERUS

WASTEWATER FLOWS

Wastewater flows for the City of Soap Lake are shown in Table 4-1.

TABLE 4-1

Wastewater Flows (MG)[1]

Month	2011	2012	2013	2014	2015	Average
January	2.91	3.81	5.10	5.61	2.91	4.07
February	2.76	4.74	5.19	5.61	3.03	4.27
March	2.85	5.31	5.13	5.46	3.17	4.38
April	3.24	5.88	5.31	(2)	3.15	4.40
May	4.83	5.61	5.37	5.10	3.33	4.85
June	5.46	(2)	5.46	5.79	3.48	5.05
July	4.62	6.15	5.46	6.06	3.36	5.13
August	4.11	5.94	5.52	6.12	3.39	5.02
September	4.41	5.88	5.58	4.80	3.12	4.76
October	3.99	6.03	5.67	4.89	3.06	4.73
November	4.23	6.00	5.61	4.77	3.00	4.72
December	4.02	5.37	5.52	3.39	3.18	4.30
Average	**3.95**	**5.52**	**5.41**	**5.24**	**3.18**	**4.64**
Total	**47.43**	**66.24**	**64.92**	**62.84**	**38.18**	**55.66**
AAF (MGD)	**0.13**	**0.18**	**0.18**	**0.17**	**0.10**	**0.15**
MMF (MGD)	**0.18**	**0.21**	**0.19**	**0.20**	**0.12**	**0.17**

(1) Source: 2011-2015 Discharge Monitoring Reports.
(2) No data was available for June 2012 and April 2014.

This table shows that the average monthly flow over the last five years is 4.64 MG, corresponding to 55.7 MG per year. The larger measurements in 2012-2014 may be explained by a different operator measuring influent flow at the WWTF. To be conservative, the average monthly flows for the highest year, 2012, will be used for planning purposes. This average monthly flow of 5.52 MG results in an annual flow of 66.2 MG and an AAF of 0.181 MGD.

CURRENT CITY ERUS

To determine the number of residential and commercial units with sewer service, City sewer account records were reviewed. Information contained in the sewer account records includes the total number of customers, units by class and the address. According to the City's 2012 Water System Plan, approximately 74.4 percent of the City's water use is from single-family residential use, 11.1 percent is from multi-family residential use, 14.5 percent is from commercial use. Wastewater discharges are typically proportional to water usage. Therefore, ERUs have been assigned based on water usage and the number of connections of each class. Each commercial connection was determined to be two ERUs per the Water System Plan. Multi-family residential connections are billed based on the number of residential connection as appropriate. The City does not have any industrial sewer connections.

TABLE 4-2

Current ERUs

Service Type	Connections	ERUs
Residential	557	557
Commercial	101	202
Standby	65	0
No Service/ Other	79	0
Total	**802**	**759**

COLLECTION SYSTEM DESIGN FLOW

The AAF is calculated by dividing the total yearly flow through the primary wastewater treatment facility (66.2 million gallons) by the number of days in the year (365), which gives an AAF equal to 181,000 gpd. Dividing the AAF by the ERU total gives approximately 238 gpd per ERU. The MMF is calculated by dividing the total flow in the largest highest monthly flow by the number days in the month. The MMF is 0.205 MGD, from July 2012.

According to City Wastewater Treatment Facility Discharge Monitoring Reports (DMRs), the MDF through the treatment facility was 0.235 MG, occurring on June 21, 2011. Dividing the MDF by the ERU total gives approximately 310 gpd per ERU.

Peak hour flows are not available from the City's monitoring reports. The Department of Ecology Criteria for Sewage Works Design provides a formula to estimate the diurnal peaking factor:

$$PF = \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$$

where PF is the diurnal peaking factor (the ratio of daily peak hour flow to average annual flow), and P is the population in thousands. For an estimated population of 1,543 in 2016, the peaking factor is 3.7.

Multiplying the peaking factor of 3.7 by 238 gpd per ERU yields 881 gpd per ERU. Dividing 881 gpd per ERU by 1,440 gives a value of 0.61 gpm per ERU. A peak flow of 0.61 gpm per ERU will be used as a collection system design value in this plan.

ASSIGNMENT OF FLOWS TO DRAINAGE BASINS

Individual drainage basins A, B, and C are split into subbasins as shown in Figure 3-3. Figure 4-1 shows the capacity of trunklines within the City. The velocity calculated in Figure 4-1 is the maximum velocity in the pipes before sewage backup will occur and is calculated according to the Hazen-Williams equation:

$$V = kCR^{0.63}S^{.54}$$

where V is the velocity in the pipe, k is a conversion factor of 1.318 for U.S. customary units, C is a roughness coefficient of 110 for concrete pipes, R is the hydraulic radius of the pipe assuming full pipe flow, and S is the slope of the pipe. ERUs for each subbasin were assigned based on the address and type of sewer connection for all City sewer connections. Table 4-3 shows the number of ERUs in each subbasin, the estimated peak flow with the assumption of 0.61 gpm per ERU, the estimated trunkline capacity, and the resulting peak flows in each lift station. This table shows that all of the City's trunklines are sufficiently sized to handle peak flows. The Canna Street, Daisy Street, and Main Avenue Subbasins all flow into Lift Station 1. Lift Station 1 combines with the Ash Street Subbasin. The Ash Street, Lakeshore Drive, 1st Avenue, and Division Street Subbasins all flow into Lift Station 2, where sewage is then pumped to the WWTF. Therefore, Lift Station 2 must handle all flows within the collection system.

TABLE 4-3

Peak Subbasin Flows

Subbasin	ERUs	Trunkline Peak Flow (gpm) [(1)]	Trunkline Capacity (gpm) [(2)]
Canna Street	45	28	326[(4)]
Daisy Street	266	163	790
Main Avenue	130	80	640
Lift Station 1		270	
Lakeshore Drive	94	58	770
1st Avenue	78	48	1000
Division Street	140	86	690
Ash Street	6	274[(3)]	2200
Lift Station 2		465	
Total	**759**	**465**	

(1) Based on assumed peak flow per ERU and number of ERUs in the subbasin.
(2) Trunkline capacity from Figure 4-1.
(3) Flow includes discharge from Lift Station 1.
(4) Capacity estimated based on surface elevations; exact inverts and slope of pipe unknown.

PROJECTED GROWTH AND FLOWS

Assuming an average annual growth of 1.5 percent as discussed in Chapter 2, the projected 6-year and 20-year ERUs are as shown in Table 4-4. The trunkline flows in each subbasin are shown in Table 4-5.

TABLE 4-4

2015 Projected ERUS

Service Type	Current ERUs	6-Year ERUs	20-Year ERUs
Residential	557	609	750
Commercial	202	221	272
Total	**759**	**830**	**1022**

TABLE 4-5

Projected Peak Subbasin Flows

Subbasin	Current ERUs	6-Year ERUs(1)	6-Year Trunkline Peak Flow (GPM)(1)	20-Year ERUs(1)	20-Year Trunkline Peak Flow (GPM)(1)	Trunkline Capacity (GPM)
Canna Street	45	49	30	61	37	326(3)
Daisy Street	266	291	178	358	220	790
Main Avenue	130	142	87	175	107	640
Lift Station 1			295		364	
Lakeshore Drive	94	103	63	127	78	770
1st Avenue	78	85	52	105	64	1000
Division Street	140	153	94	189	116	690
Ash Street	6	7	299	8	369(2)	2200
Lift Station 2			509		626	
Total	759	830	509	1022	626	

(1) Assumes 1.5 percent annual growth
(2) Flow includes discharge from Lift Station 1.
(3) Capacity estimated based on surface elevations; exact inverts and slope of pipe unknown.

Table 4-5 shows that each of the City's trunklines has sufficient capacity to handle peak flows through the 20-year planning period.

SOAP LAKE

MH 1
IE=1089.55

MH 2
IE=1122.94

MH 3
IE=1083.41

MH 4
IE=1127.51

MH 5
IE=1104.41

MH 6
IE=1100.50

MH 7
IE=1089.05

MH 9
IE=1106.98

MH 10
IE=1134.30

MH 11
IE=1161.52

LIFT STATION NO. 1

LIFT STATION NO. 2

CITY HALL

WASTEWATER TREATMENT FACILITY

LAKE SHORE DR
3RD AVE NW
5TH ST
MAIN
ST W
MAPLE ST
JUNIPER ST
HEMLOCK ST
GINKGO ST
FIR ST
EVERGREEN ST
DOGWOOD ST
CHERRY ST
BIRCH ST
ASH ST
DIVISION ST N
DIVISION ST S
1ST AVE NE
MAIN AVE
2ND AVE SE
2ND AVE SW
3RD AVE SE
4TH AVE SE
4TH PL
5TH AVE
6TH AVE SE
7TH AVE SE
8TH AVE SE
2ND PL SE
3RD PL SE
ASTER ST S
BUTTERCUP ST S
CANNA ST N
CANNA ST S
SR 17
ELDER ST N
ELDER ST S
FERN ST N
FERN ST S
GLADIOLA ST N
GLADIOLA ST S
EASTLAKE AVE
WARD ST
WOODLAND ST
4TH AVE NE
3RD AVE NE
2ND AVE NE
1ST AVE NE
SR 28
LAKEMORE DR

1" = 600'

LEGEND

- CITY LIMITS
- UGA
- 6" SEWER
- 8" SEWER
- 10" SEWER
- 12" SEWER
- "X" SEWER
- TRUNKLINE
- FORCEMAIN
- MANHOLE

MH #	Diamter Out (In.)	Invert Elevation (NAVD88)	Dist. to Next MH (ft)	Next Structure	Slope	Velocty (ft/s)	Flow (gpm)
1	8	1089.55	2175	MH 3	1.54%	4.92	770
2	8	1122.94	1585	MH 3	2.49%	6.39	1001
3	8	1083.41		LS 2			
4	8	1127.51	3502	MH 3	1.26%	4.42	692
5	12	1104.41	1412	LS 2	1.49%	6.24	2199
6	10	1100.5	2106	MH 7	0.54%	3.23	791
7	8	1089.05		LS 1			
9	8	1106.98	1643	MH 7	1.09%	4.09	641
10	8	1134.3	875	MH 9	3.12%	7.21	1130
11	6	1161.52	624	MH 10	4.36%	7.21	635

CITY OF SOAP LAKE

GENERAL SEWER PLAN
FIGURE 4-1
EXISTING SYSTEM CAPACITY

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CONSULTING ENGINEERS

COLLECTION SYSTEM IMPROVEMENTS

Alternatives Considered

The sewer collection pipe improvements were evaluated according to four alternatives: open trench replacement, cured-in-place rehabilitation, pipe bursting rehabilitation, and fold and form pipe. Figure 4-2 shows which projects were selected based on the condition of the sewer main as shown in the video evaluation.

Open trench replacement consists of excavating a trench and installing new sewer pipe and bedding. Open trench replacement is estimated to be the most costly, would cause the most environmental disturbance, and would require significant patching of the street surface. The benefit of this alternative is that new pipe is placed in the ground with bedding and cover meeting current specifications. It is also the only method which can correct horizontal and vertical deficiencies or allow upsizing of sewer main to any pipe size. Replacement of the sewer with new pipe is a more feasible option if the sewer main can be installed in conjunction with scheduled road improvements. Coordination of sewer main replacement with roadway repairs will greatly reduce the surface restoration cost of each project and prevent unnecessary traffic disturbance. Figure 4-3 shows planned roadway and water main improvements along with sewer main capital improvements.

Cured-in-place (CIP) rehabilitation includes insertion of a jointless, seamless pipe within a pipe. The advantages of this method are that little to no digging is involved and the surface repairs are minimal. The disadvantages of this method are that sags and imperfections in the slope of the pipe cannot be corrected as the pipe will follow the path of the existing deteriorated pipe. Side sewer connections must be cut out or dug up. Also, CIP rehabilitation reduces the inside diameter of the pipe. The smoothness of CIP may result in reduced or no capacity loss. Because capacity is not an issue, trenchless CIP is an attractive option.

Pipe bursting is a trenchless technology similar to CIP; however pipe bursting will correct some minor existing deficiencies with joints and sags in sewer pipe. In addition, it is possible to upsize the pipe by one to two pipe sizes. The disadvantages of this method are that the launch and receiver pit require additional excavation in comparison to the CIP method, side sewers must be excavated, and it may be more expensive than CIP.

Fold and form pipe repair is accomplished by using either folded PVC or HDPE pipe that is inserted into the pipe. The existing pipe must first be removed from service and cleaned prior to the insertion of the liner. Once inserted, the folded pipe is heated to activate the pipe, expanding it to take the shape of the existing pipe. The liner is then allowed to cool and harden the material. After cooling, any lateral pipes are located, the liner cut with a robotic cutter, and the main line is put back into service. The process takes approximately 3-4 hours for 300 feet of pipe.

For cost estimation purposes, it is assumed that the City will replace pipe by utilizing open trench replacement; however, the City should evaluate the use of alternative methods of repair on a case-by-case basis.

Comparison of Non-Monetary Costs/Benefits

As a part of Ecology's State Environmental Review Process each alternative must be evaluated for both monetary and nonmonetary benefits. As identified above, at this time it is uncertain as to which technology will be used for each project, and many factors will be taken into account during design to utilize the most appropriate technology. Aside from project cost, selection of a technology will include non-monetary benefits such as correcting sags and imperfections in the slope of the existing pipe that will prevent future operations and maintenance issues, as well as future capacity issues. It is assumed that there will not be a significant environmental impact based upon selection of a technology, although trenchless technologies will require less excavation, which will result in a marginally reduced overall environmental impact.

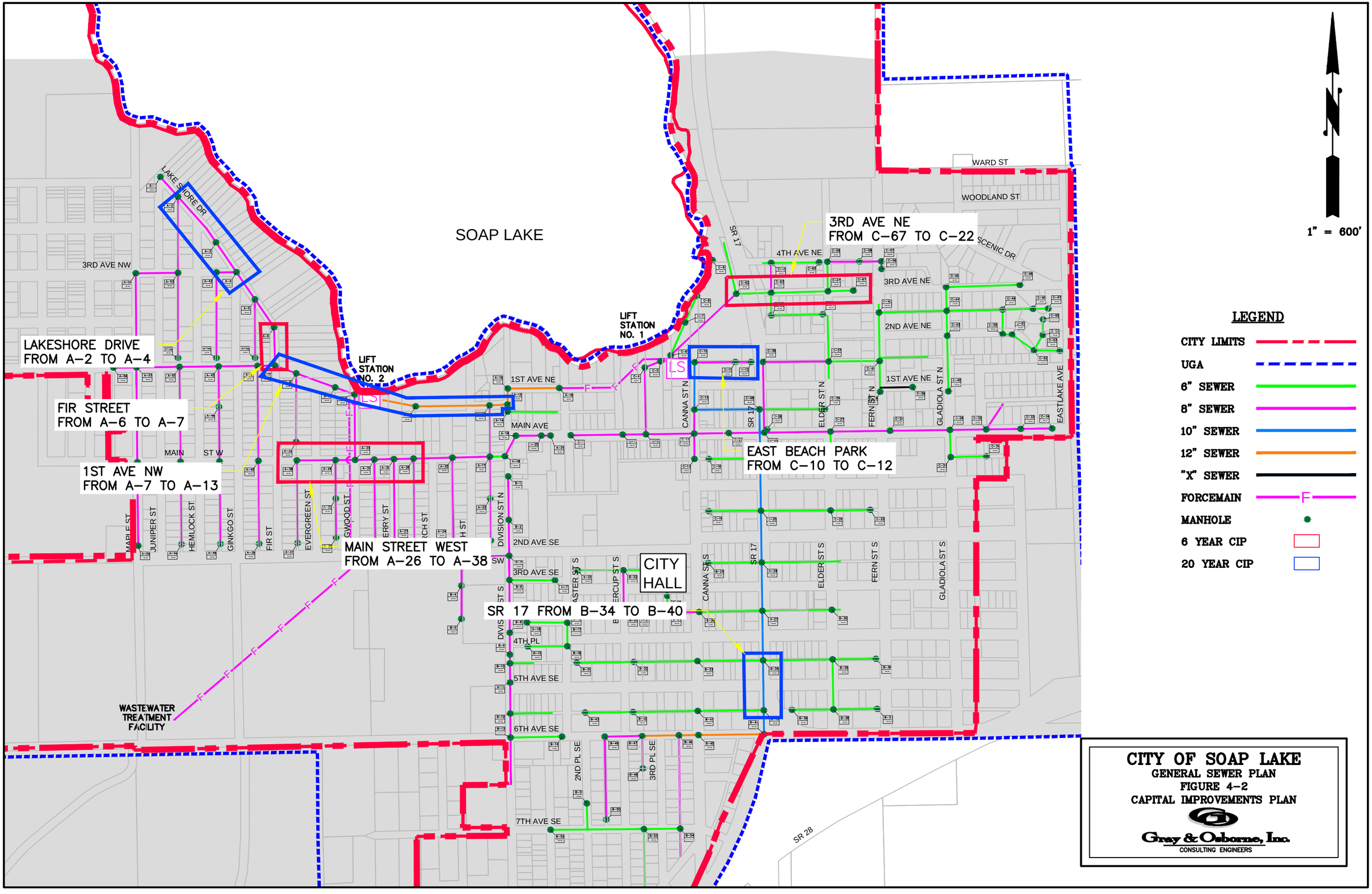
Present Worth Analysis

The City does not anticipate significant changes to its collection system operations and maintenance costs related to the proposed improvements, although as sewers are replaced it will be able to focus its manpower on other areas of the system. The correction of sags and alignment issues in the collection system is anticipated to reduce the amount of time spent cleaning sewers and addressing sewer backups in individual areas, therefore the selection of technologies that can correct these problems will be a consideration when selecting technologies for projects where this is a relevant issue. Similarly, although there are potential differences in the anticipated life of pipes installed through different technologies, it is not likely that the difference will be significant enough for the City to take this into account in a lifecycle cost.

Drainage Basin A

Drainage Basin A lies due east of Drainage Basin B on the east shore of Soap Lake and consists of a gravity collection system that flows into Lift Station 1. The collection system within this basin currently serves approximately 393 total acres, with approximately 300 acres served by the collection system at this time. The drainage basin consists of approximately 441 local ERUs. It is anticipated that growth within this drainage basin will increase the total local ERUs to approximately 482 and 594 by the end of the 6-year and 20-year planning periods, respectively.

Lift Station 1 consists of two Smith & Loveless self-priming centrifugal pumps located at the north end of Canna Street. This lift station serves the Main Avenue, Daisy Street, and Canna Street subbasins, pumps at approximately 320 gpm, and has sufficient capacity through the 6-year planning period. According to Table 4-3 and Table 4-5, Lift Station 1 currently sees peak flows of 270 gpm, and peak flows may increase to 364 gpm at the end


SOAP LAKE
LAKE SHORE DR
3RD AVE NW
LAKESHORE DRIVE
FROM A–2 TO A–4
FIR STREET
FROM A–6 TO A–7
1ST AVE NW
FROM A–7 TO A–13
MAIN ST W
MAPLE ST
JUNIPER ST
HEMLOCK ST
GINKGO ST
FIR ST
EVERGREEN ST
GWOOD ST
ERRY ST
ICH ST
H ST
LIFT STATION NO. 2
LS
1ST AVE NE
MAIN AVE
LIFT STATION NO. 1
SR 17
3RD AVE NE
FROM C–67 TO C–22
4TH AVE NE
WARD ST
WOODLAND ST
SCENIC DR
3RD AVE NE
2ND AVE NE
1ST AVE NE
CANNA ST N
ELDER ST N
FERN ST N
GLADIOLA ST N
EASTLAKE AVE
EAST BEACH PARK
FROM C–10 TO C–12
DIVISION ST N
2ND AVE SE
3RD AVE SE
MAIN STREET WEST
FROM A–26 TO A–38
SW
CITY HALL
SR 17 FROM B–34 TO B–40
4TH PL
5TH AVE SE
6TH AVE SE
7TH AVE SE
2ND PL SE
3RD PL SE
WASTEWATER TREATMENT FACILITY
SR 28
1" = 600'
LEGEND
CITY LIMITS
UGA
6" SEWER
8" SEWER
10" SEWER
12" SEWER
"X" SEWER
FORCEMAIN
MANHOLE
6 YEAR CIP
20 YEAR CIP
CITY OF SOAP LAKE
GENERAL SEWER PLAN
FIGURE 4-2
CAPITAL IMPROVEMENTS PLAN
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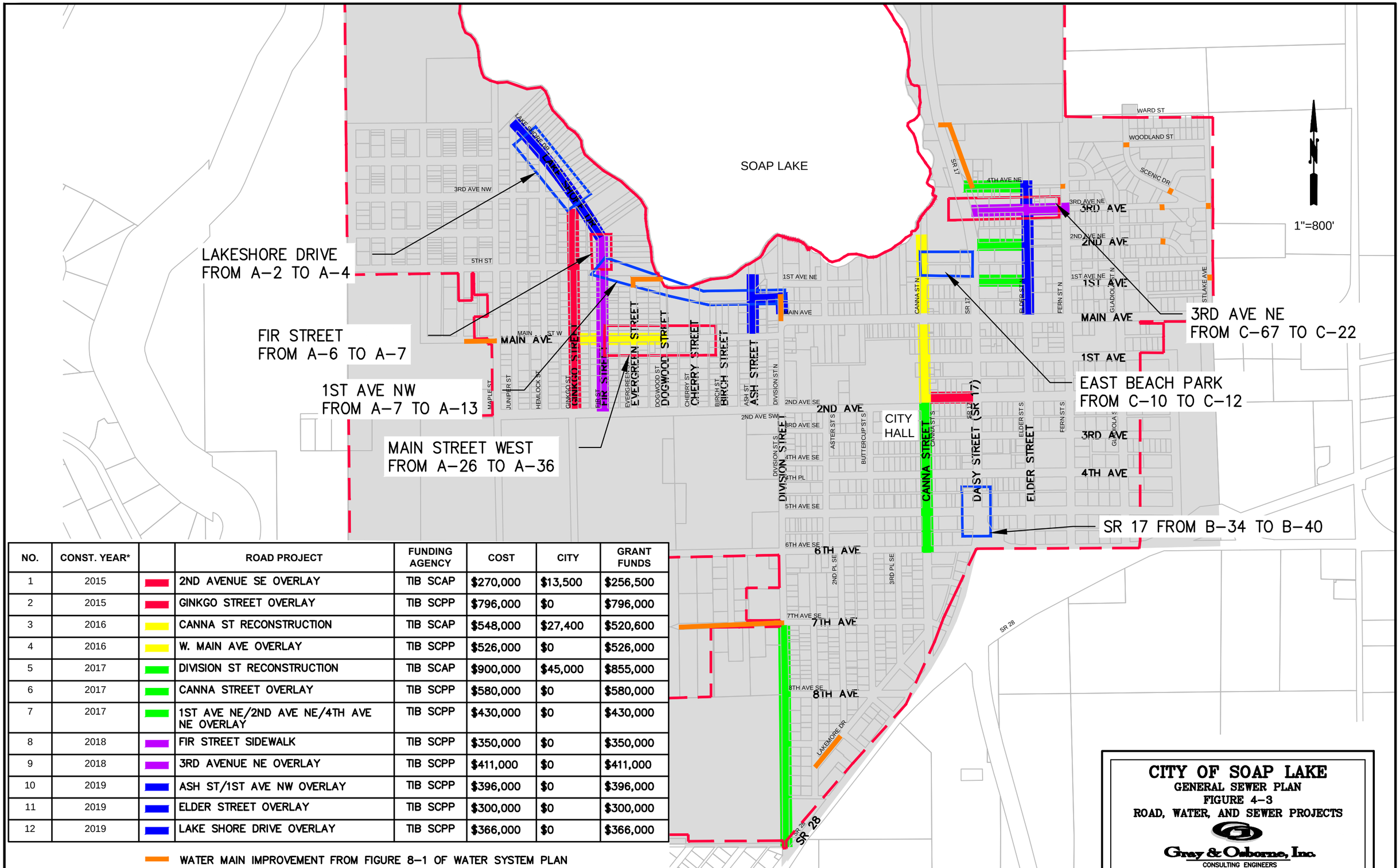


NO.	CONST. YEAR*		ROAD PROJECT	FUNDING AGENCY	COST	CITY	GRANT FUNDS
1	2015		2ND AVENUE SE OVERLAY	TIB SCAP	$270,000	$13,500	$256,500
2	2015		GINKGO STREET OVERLAY	TIB SCPP	$796,000	$0	$796,000
3	2016		CANNA ST RECONSTRUCTION	TIB SCAP	$548,000	$27,400	$520,600
4	2016		W. MAIN AVE OVERLAY	TIB SCPP	$526,000	$0	$526,000
5	2017		DIVISION ST RECONSTRUCTION	TIB SCAP	$900,000	$45,000	$855,000
6	2017		CANNA STREET OVERLAY	TIB SCPP	$580,000	$0	$580,000
7	2017		1ST AVE NE/2ND AVE NE/4TH AVE NE OVERLAY	TIB SCPP	$430,000	$0	$430,000
8	2018		FIR STREET SIDEWALK	TIB SCPP	$350,000	$0	$350,000
9	2018		3RD AVENUE NE OVERLAY	TIB SCPP	$411,000	$0	$411,000
10	2019		ASH ST/1ST AVE NW OVERLAY	TIB SCPP	$396,000	$0	$396,000
11	2019		ELDER STREET OVERLAY	TIB SCPP	$300,000	$0	$300,000
12	2019		LAKE SHORE DRIVE OVERLAY	TIB SCPP	$366,000	$0	$366,000

WATER MAIN IMPROVEMENT FROM FIGURE 8-1 OF WATER SYSTEM PLAN

*ROADWAY IMPROVEMENTS LISTED FOR 2015 STILL HAVE NOT BEEN COMPLETED AND WILL BE RESCHEDULED AT A LATER TIME.

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 4-3

ROAD, WATER, AND SEWER PROJECTS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

of the 20-year planning period. If flows increase as predicted, the 20-year flows will exceed the capacity of this lift station. At that time, the City will need to upsize the existing pumps or install a new lift station.

No section of the sewer system is anticipated to reach capacity within the 20-year planning period. Improvements identified are primarily to address physical condition of the system and are prioritized based on the results of the video evaluation. Coordination between roadway improvements and sewer replacement also plays an important role in scheduling sewer improvements.

6-Year Improvements

New 8-Inch Sewer from MH C-67 to MH C-62— This improvement consists of the replacement of approximately 830 lineal feet of existing 6-inch sewer main with 8-inch sewer main pipe along 3rd Avenue NE. This improvement is suggested because the existing concrete pipe has severe aggregate exposure, root intrusions, cracks, and offset joints.

20-Year Improvements

New 10-Inch Sewer from MH B-34 to MH B-40— This improvement consists of the replacement of approximately 350 lineal feet of existing 10-inch sewer main with 10-inch sewer main pipe along SR 17. This improvement is suggested because there is severe aggregate exposure and large chunks of grout sitting in the pipe.

New 8-Inch Sewer from MH C-10 to MH C-12 – This improvement consists of the replacement of approximately 400 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along East Beach Park. This improvement is suggested because there is severe aggregate exposure and some offset joints.

Drainage Basin B

Drainage Basin B lies due west of Drainage Basin A and consists of a gravity collection system that flows into Lift Station 2. Approximately 170 acres of the 773 acres in this basin are served by the City's sewer system. Based on sewer account records, this drainage basin consists of approximately 318 ERUs. It is anticipated that growth within this drainage basin will increase the total local ERUs to approximately 348 and 428 by the end of the 6-year and 20-year planning periods, respectively.

Lift Station 2 consists of two Smith & Loveless self-priming centrifugal pumps located at the north end of Dogwood Street. This lift station receives flows from the Lakeshore, 1st Avenue, Ash Street, and Division Street subbasins. It also receives flows from Lift Station 1. Thus, this lift station serves the entire City, and all flows to the wastewater treatment facility are pumped y this lift station.

According to Table 4-3 and Table 4-5, Lift Station 2 currently sees peak flows of 465 gpm, and peak flows may increase to 626 gpm at the end of the 20-year planning period. The lift station pumps are rated at 465 gpm each. As noted in the Criteria for Sewer Works Design, it is recommended that lift stations be designed to pump peak hour flow with the largest pump out of service. If growth occurs, the lift station will not meet this criteria. However, the City has a backup lift station to provide additional pumping if a Lift Station 2 pump is out of service during high flow. Therefore, it is recommended that the City continue to exercise and maintain the backup lift station as an alternate approach to upsizing the Lift Station 2 to meet projected peak hour flows with a single pump.

Currently, the houses located in the Lakeview development within Drainage Basin B are not served by the sewer system because they are outside of the City limits and the City's Urban Growth Area. The elevation along the west side of the Lakeview development ranges from 1220 feet at the south end to 1195 feet at the north end. The elevation at the east side of the development ranges from 1190 feet at the south end to 1165 feet at the north end. With an elevation of approximately 1164 feet at the wastewater treatment facility, the City would need to construct a lift station and force main at least 3,600 linear feet in length to pump directly to the wastewater treatment facility. Alternatively, the City could install 2,400 feet of gravity sewer main to connect to the sewer main along Division Street. However, this would substantially increase the flows within Lift Station 2 and within the sewer main flowing to Lift Station 2. With an estimated population of 700 and assuming wastewater characteristics similar to the City of Soap Lake, this development would add approximately 342 ERUs, corresponding to a peak flow of 208 gpm and an AAF of 81,000 gpd. Upgrades at the WWTF would be necessary to provide treatment for this additional flow. This development would need to be annexed into the City's UGA in order to receive sewer service.

No section of the sewer system is anticipated to reach capacity within the 20-year planning period. Improvements identified are primarily to address physical conditions such as root intrusions or offset joints and are prioritized based on the results of the video evaluation and planned roadway improvements.

6-Year Improvements

New 8-Inch Sewer from MH A-6 to MH A-7— This improvement consists of the replacement of approximately 270 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along Lakeshore Drive. This improvement is suggested because of severe aggregate exposure, large cracks, and broken sections of pipe within this segment.

New 8-Inch Sewer from MH A-26 to MH A-38— This improvement consists of the replacement of approximately 830 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along Main Street West. This improvement is suggested because the existing clay pipe is cracking and has large pieces falling out of it. In particular the section between MH A-34 and MH A-38 is in poor condition. The section between MH A-34 and MH A-31 is in good condition, but since it is a clay pipe, it is recommended that it be replaced when the adjacent sections are replaced.

New 8-Inch Sewer from MH A-2 to MH A-4— This improvement consists of the replacement of approximately 680 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along Lakeshore Drive. This improvement is suggested because the existing concrete pipe has severe aggregate exposure and many small root intrusions. This project is in the 6-year planning period due to scheduling of a roadway improvement.

20-Year Improvements

New 8-Inch Sewer from MH A-7 to MH A-10/ New 12-Inch Sewer from MH A-13 to Lift Station 2— This improvement consists of the replacement of approximately 630 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along the field north of Evergreen Street and the replacement of approximately 890 lineal feet of existing 12-inch sewer main with 12-inch sewer main pipe along 1st Avenue NW. This improvement is suggested because the existing concrete pipe has severe aggregate exposure and many small root intrusions. The portion of this project between MH A-12 and MH A-13 may be moved to the 6-year planning period dependent on funding availability for roadway and sewer improvements.

Drainage Basin C

Drainage Basin C is located southwest of the City. Currently, there are is no sewer service within this area as it is outside of the City Limits and the City's Urban Growth Area. If the City were to annex this area into its City Limits in the future, it should evaluate the feasibility of providing sewer service in this drainage basin. A sewer trunk line from the Lakeview Heights development to the WWTF would be approximately 2,600 feet in length and would drop from an elevation of about 1230 feet to 1164 feet. With an average slope of 2.5 percent, it would be feasible to connect this area to the wastewater treatment facility via a gravity flow sewer main. This development would need to be annexed into the City's UGA in order to receive sewer service.

Long Term Pipe Replacement

In addition to the specific sections of sewer main identified for replacement in the video evaluation, the City should perform additional video evaluation and replacement of sewer main as its infrastructure ages. The City has a total of approximately 11.5 miles (60,940 LF from Table 3-1) of gravity sewer main, of which 7,335 LF was videoed. At $3.70/LF, which would include engineering evaluation, video evaluation of the remainder of the collection system would cost $200,000. Alternatively, the City may be able to purchase its own camera or rent a camera from a nearby municipality complete its own video assessment. In order to properly clean the lines, the City would need to purchase a new sewer jet truck. The cost of one of these trucks is estimated at $100,000 for a used truck that is two years old. Video evaluation determined that about 39 percent of sewer mains were in fair condition and 19 percent were in poor condition. Figure 4-4 shows additional problem areas that the City has identified in the collection system.

Approximately 12,000 LF of additional sewer main should be scheduled for replacement in order to replace the estimated quantity of sewer main in poor condition within the next 20 years. Assuming an average cost of $350/LF for full replacement, this would equate to a total investment of $4.2 million. This amount could be significantly reduced by replacing sewer main while completing roadway improvements or by utilizing CIP or pipe bursting as appropriate.

Summary

The analysis of the existing sewage collection system indicates that there are some improvements needed within the 6-year planning period of this Plan. The needed improvements are due to deterioration of the existing sewer pipes. Table 4-6 provides a summary of both the 6-year and 20-year improvements for each drainage basin as discussed in the chapter. Appendix D shows the cost estimate for each project. Financing of these improvements is discussed in Chapter 6.

TABLE 4-6

6-Year and 20-Year Collection System Improvements

No.	6-Year Improvements	2016 Cost
1	New 8-Inch Sewer from MH C-67 to MH C-62 along 3rd Ave NE	$260,000
2	New 8-Inch Sewer from MH A-2 to MH A-4 along Lakeshore Drive	$226,000
3	New 8-Inch Sewer from MH A-6 to MH A-7 along Fir Street	$116,000
4	New 8-Inch Sewer from MH A-26 to MH A-36 along Main Street West	$260,000
	6-Year Total:	**$862,000**
No.	**20-Year Improvements**	**2016 Cost**
5	New 10-Inch Sewer from MH B-34 to MH B-40 along SR 17	$143,000
6	New 8-Inch Sewer from MH C-10 to MH C-12 along East Beach Park	$147,000
7	New 8-Inch Sewer from MH A-7 to MH A-10/ New 12-Inch Sewer from MH A-13 to Lift Station 2 along 1st Ave NW	$457,000
8	Video Evaluation of Collection System	$200,000
9	Sewer Jet Truck	$100,000
10	Additional Sewer Main Replacement	$4,200,000
	6-Year and 20-Year Total:	**$6,109,000**

SOAP LAKE

LAKE SHORE DR

3RD AVE NW

5TH ST

MAIN ST W

MAPLE ST

JUNIPER ST

HEMLOCK ST

GINKGO ST

FIR ST

EVERGREEN ST

DOGWOOD ST

CHERRY ST

BIRCH ST

ASH ST

LIFT STATION NO. 2

LS

LIFT STATION NO. 1

LS

1ST AVE NE

MAIN AVE

2ND AVE SE

2ND AVE SW

3RD AVE SE

4TH AVE SE

4TH PL

5TH AVE SE

6TH AVE SE

7TH AVE SE

8TH AVE SE

DIVISION ST N

DIVISION ST S

ASTER ST S

BUTTERCUP ST S

CITY HALL

CANNA ST N

CANNA ST S

SR 17

ELDER ST N

ELDER ST S

FERN ST N

FERN ST S

GLADIOLA ST N

GLADIOLA ST S

EASTLAKE AVE

4TH AVE NE

3RD AVE NE

2ND AVE NE

1ST AVE NE

WARD ST

WOODLAND ST

SCENIC DR

2ND PL SE

3RD PL SE

SR 28

LAKEMORE DR

WASTEWATER TREATMENT FACILITY

F

1" = 600'

LEGEND

- CITY LIMITS
- UGA
- 6" SEWER
- 8" SEWER
- 10" SEWER
- 12" SEWER
- "X" SEWER
- FORCEMAIN
- MANHOLE
- PROBLEM AREA

CITY OF SOAP LAKE

GENERAL SEWER PLAN

FIGURE 4-4

CITY-IDENTIFIED ISSUES

Gray & Osborne, Inc.

CONSULTING ENGINEERS

CHAPTER 5

WASTEWATER TREATMENT FACILITY

BACKGROUND AND HISTORY

The City of Soap Lake constructed a WWTF in 1978 to replace an existing facility originally built in 1946. The 1978 facility consisted of the following:

- Influent comminutor
- Oxidation ditch with brush rotors
- Secondary clarifier
- Aerobic digester
- Sludge drying beds
- A sprayfield
- A drainfield system

The sprayfield was abandoned during the first year of service because of fear of aerosol drift to the road and neighboring school. The drainfield did not provide the level of treatment and protection of the groundwater that is currently required. The drainfield was determined to be too small to adequately infiltrate the existing effluent flows in 2000, and has therefore not been used since upgrades were finished in 2004. The major components of the 2004 upgrade included the following:

- Replacement of influent comminutor with influent grinder
- Oxidation ditch modifications to implement nitrogen removal
- A new secondary clarifier
- Sludge handling facilities upgrade
- Rapid infiltration basins to replace the land application drainfield

Subsequent to the 2004 improvements, the City's solids handling processes caused significant operations and maintenance problems. Furthermore, the State issued WAC 173-308-205, which required that the City remove manufactured inerts from its biosolids prior to disposal. The City identified that improvements were necessary, and completed the 2013 Engineering Report to summarize the future needs of the WWTF. The Engineering Report identified two phases of improvements. Phase I improvements were completed in 2015. The Phase I improvements included the following:

- Potable water booster pump station
- Mechanical fine screen
- RAS pump station
- Aerobic digester aerators

- Modification of the Operations Building to address hazardous classified area requirements
- Electrical modifications throughout the WWTF, including a new standby generator and 480V electrical service

The City has not yet completed the Phase II improvements, which are expected to include the following:

- Modification of the influent sampler
- Bioselectors
- Anoxic basin
- Paint Secondary Clarifier 1
- Secondary clarifier splitter box
- Additional sludge drying beds
- Installation of a floating aerator in the oxidation ditch
- Floating decanter in the aerobic digester
- Nonpotable water system
- Additional effluent pump

The estimated cost for the Phase II improvements was $1,429,000 in the Engineering Report. It is assumed that due to inflation, the cost to complete these improvements will increase in the future. Table 5-1 shows the cost estimate for the Phase II improvements as estimated in the 2013 Engineering Report and an increase of 7.3 percent to account for an increase in the Engineering News-Record index values between January 2013 (9,437) and January 2016 (10,133).

TABLE 5-1

Phase II Improvements Cost Estimate

No.	Item	Qty	Unit	Unit Price	2013 Amount	2016 Amount
1	Mobilization	1	LS	$ 77,000	$ 77,000	$ 82,700
2	Trench Safety Systems	1	LS	$ 10,000	$ 10,000	$ 10,700
3	SPCC Plan	1	LS	$ 5,000	$ 5,000	$ 5,400
4	Excavation/Backfill	530	CY	$ 50	$ 26,500	$ 28,500
5	Modify Lift Station 2	1	LS	$ 20,000	$ 20,000	$ 21,500
6	Bioselector Mixer	1	LS	$ 55,000	$ 55,000	$ 59,100
7	Bioselector Structure	1	LS	$ 80,000	$ 80,000	$ 85,900
8	Anoxic Basin	60	CY	$ 1,250	$ 75,000	$ 80,500
9	Recycle Pump	1	LS	$ 30,000	$ 30,000	$ 32,200
10	Vertical Mixers	2	EA	$ 37,500	$ 75,000	$ 80,500
11	Site Piping	1	LS	$ 50,000	$ 50,000	$ 53,700
12	Sampler Modification	2	EA	$ 3,000	$ 6,000	$ 6,400
13	Oxidation Ditch Surface Aerator	1	LS	$ 25,000	$ 25,000	$ 26,800
14	Oxidation Ditch Structural Modification	1	LS	$ 6,000	$ 6,000	$ 6,400
15	Secondary Clarifier 1 Painting	1	LS	$ 10,000	$ 10,000	$ 10,700
16	Floating Decanter w/install	1	EA	$ 20,000	$ 20,000	$ 21,500
17	Cross Connection Control	1	LS	$ 40,000	$ 40,000	$ 43,000
18	Nonpotable Water Pump Station	1	LS	$ 40,000	$ 40,000	$ 43,000
19	Sludge Drying Beds	1	LS	$ 38,000	$ 38,000	$ 40,800
20	Effluent Pump	1	LS	$ 30,000	$ 30,000	$ 32,200
21	Electrical, Telemetry, and Control	1	LS	$ 128,300	$ 128,300	$ 137,800
				Construction Subtotal	**$ 846,800**	**$ 909,300**
				Contingency (25%)	$ 211,700	$ 227,300
				Sales Tax (7.9 %)	$ 84,000	$ 84,000
				Subtotal	**$1,142,500**	**$1,226,600**
				Design & Construction Engineering (25%)	$ 285,600	$ 306,700
				Total Construction Cost (Rounded)	**$1,429,000**	**$1,534,000**

PERMIT REQUIREMENTS

The City of Soap Lake discharges effluent under State Waste Discharge (SWD) Permit (No. ST-5282), which was issued on February 3, 2012 and expires on February 28, 2017. The WWTF is currently permitted to discharge a maximum monthly flow of 0.30 MGD under its SWD permit. Permit requirements are shown below in Table 5-2.

TABLE 5-2

City of Soap Lake Final Effluent Limitations

Parameter	Average Monthly(1)	Average Weekly	Maximum Daily
Flow	0.30 MGD	N/A	0.42 MGD
Biochemical Oxygen Demand (5-day)	30 mg/L 85% Removal	45 mg/L	N/A
Total Suspended Solids	30 mg/L, 80 lb/d 85% Removal	45 mg/L 85% Removal	N/A
Total Nitrogen (2)	10 mg/L	N/A	N/A

(1) The average monthly effluent limitations are based on the arithmetic mean of the samples taken.

(2) Total nitrogen is defined as the sum of TKN plus nitrate and nitrite.

As addressed in the Engineering Report, the City does not currently have an effluent fecal coliform limit, presumably due to a lack of sufficient background groundwater data in the vicinity of the WWTF. The City has undertaken planning steps under the assumption that effluent disinfection will not be required in the near future. Similarly, the City has also assumed that phosphorus removal will not be required in the near future.

EXISTING WASTEWATER TREATMENT FACILITY

Raw wastewater is pumped from Lift Station 2 to the WWTF. The wastewater enters the elevated headworks structure where solids larger than ¼-inch in diameter are removed by the influent screen. At the headworks, a timed automated sampler collects composite wastewater samples for laboratory analysis of the influent. The flow then travels by gravity to the oxidation ditch.

The oxidation ditch biologically converts the organic material in the wastewater into biological cells and metabolic end products. Two brush rotors aerate the oxidation ditch.

Flow from the oxidation ditch is conveyed to the secondary clarifiers. The secondary clarifiers provide a quiescent environment where settleable secondary solids are removed from the treated wastewater. Flow enters along the circumference of the tank under a baffle and exits at the center of the tank by passing over a notched weir into a discharge launder.

Secondary effluent passes through a chlorine contact tank prior to being pumped to the rapid infiltration basins, although no chlorination chemicals are currently used because disinfection is not required by the State Waste Discharge permit.

The rapid infiltration basins consist of six earthen basins with soil conditions favorable to infiltration of treated wastewater. The operators rotate flows to one of the six basins sequentially to allow the wastewater to percolate to groundwater without overloading the soils.

The facility's waste solids treatment process includes the pumping of waste activated sludge from the bottom of the clarifiers to an aerobic digester. The digester consists of a lined earthen structure with floating aerators to provide oxygen for the aerobic destruction of biosolids. Due to the arid environment, evaporation continuously reduces the volume of water in the digester.

On a periodic basis, the City drains a portion of the digested sludge from the aerobic digester by gravity to the paved sludge drying beds. The drying beds consist of shallow, paved structures that allow the sludge to dry. Perforated drain pipe beneath the beds allows water to drain from the beds, further dewatering the sludge while evaporation occurs. Dried biosolids are stored on the solids storage slab and taken to the Boulder Park facility in Mansfield, WA for land application as Class B biosolids.

A site plan is provided in Figure 5-1, a schematic of the influent, mixed liquor suspended solids, and effluent flow is shown in Figure 5-2, and a process flow diagram is shown in Figure 5-3. A hydraulic profile is provided in Figure 5-4. A summary of flows and loadings for 2011 to 2015 is included in Appendix C.

WASTEWATER TREATMENT FACILITIES

MECHANICAL FINE SCREEN

Process Description

In 2007, WAC 173-308-205 was revised and states that all biosolids must be treated by a process such as physical screening or another method to significantly remove manufactured inerts prior to final disposal. As of July 1, 2012 biosolids that are land applied, sold, or given away must contain less than one percent by volume recognizable manufactured inerts. Screening must employ openings of 3/8-inch or smaller in size. A mechanical fine screen was installed in the most recent Phase I improvements to meet these requirements.

Design criteria for the screen are provided in Table 5-3.

TABLE 5-3

Mechanical Screen Design Criteria

Mechanical Fine Screen	
Type	Vertical Helical Auger
Quantity	1
Screen Opening Size	0.25 inch (6 mm)
Screen Diameter	10.75 inch
Maximum Hydraulic Capacity	1.05 MGD
Drive Motor Size	1 hp

INFLUENT SAMPLER

Process Description

The influent sampler is located at the mechanical fine screen. The sampler is an automatic composite sampler that takes samples once per hour over a 24-hour period. The sampler is not flow paced. Due to the generally good condition of the unit, it is recommended that the sampler be kept as part of the WWTF upgrades; however modifications will be necessary to ensure the sampler is flow paced and, therefore, the samples are more representative.

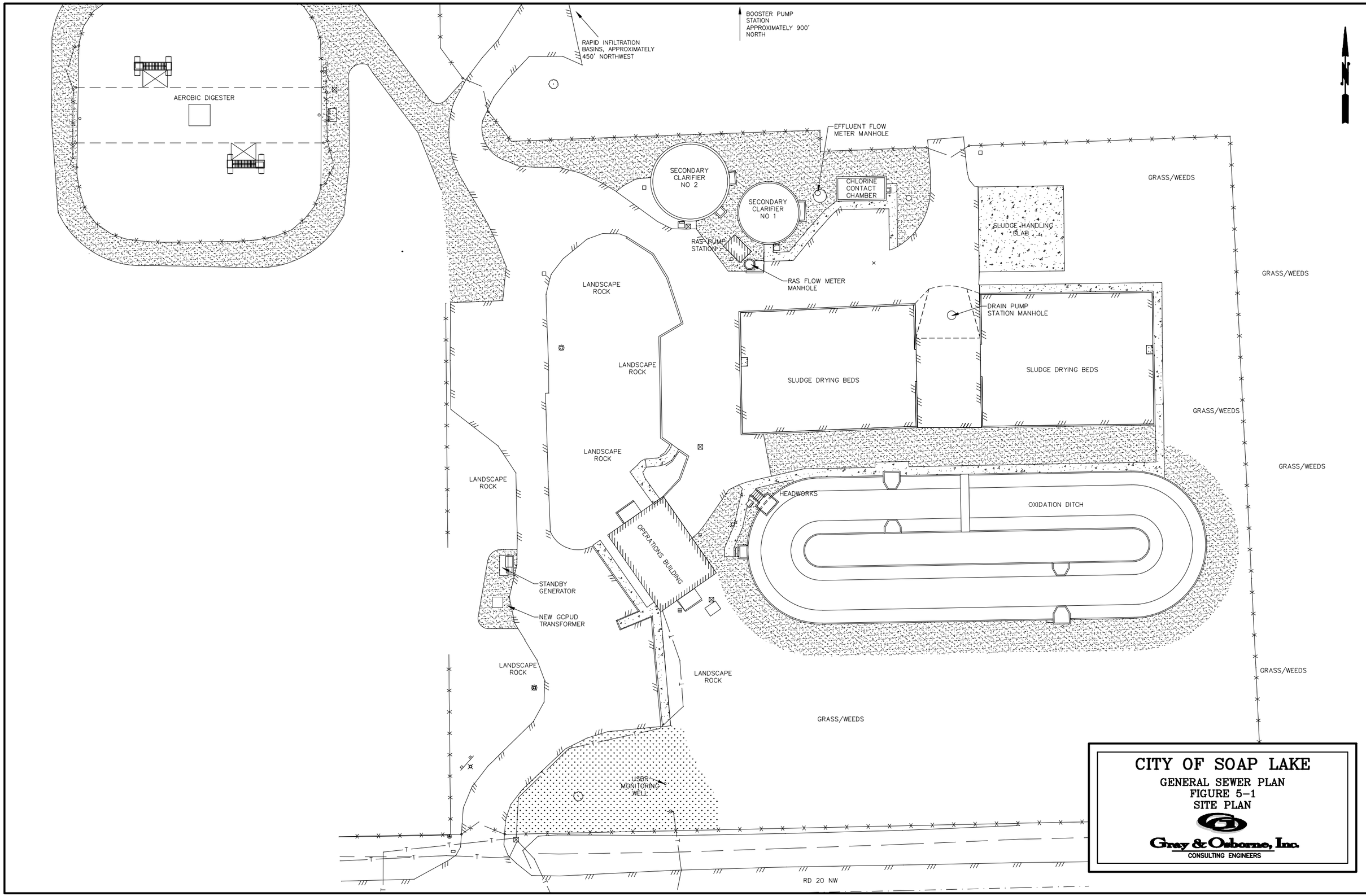
OXIDATION DITCH

Process Description

Effluent from the mechanical fine screen flows by gravity to the oxidation ditch for biological treatment. The oxidation ditch is a large, elliptical, reinforced concrete tank, which serves as the aeration basin for the activated sludge process. The liquid contents of the oxidation ditch are referred to as the "mixed liquor". The mixed liquor is aerated, mixed, and propelled around the elliptical tank by two brush rotor aerators. The organic waste provides the food source for the bacteria in the mixed liquor. The aeration provides the oxygen required by the bacteria to assimilate and break down the organic waste. The bacteria use the biodegradable organic waste material as a source of energy (through oxidation) and as a source of carbon for cell synthesis (to produce new bacterial cells). The bacterial population is continually dying and being replaced by synthesis. Ideally, the biological activities in the treatment process will be balanced so as to maintain an adequate biological population to process the available food supply.

Structural

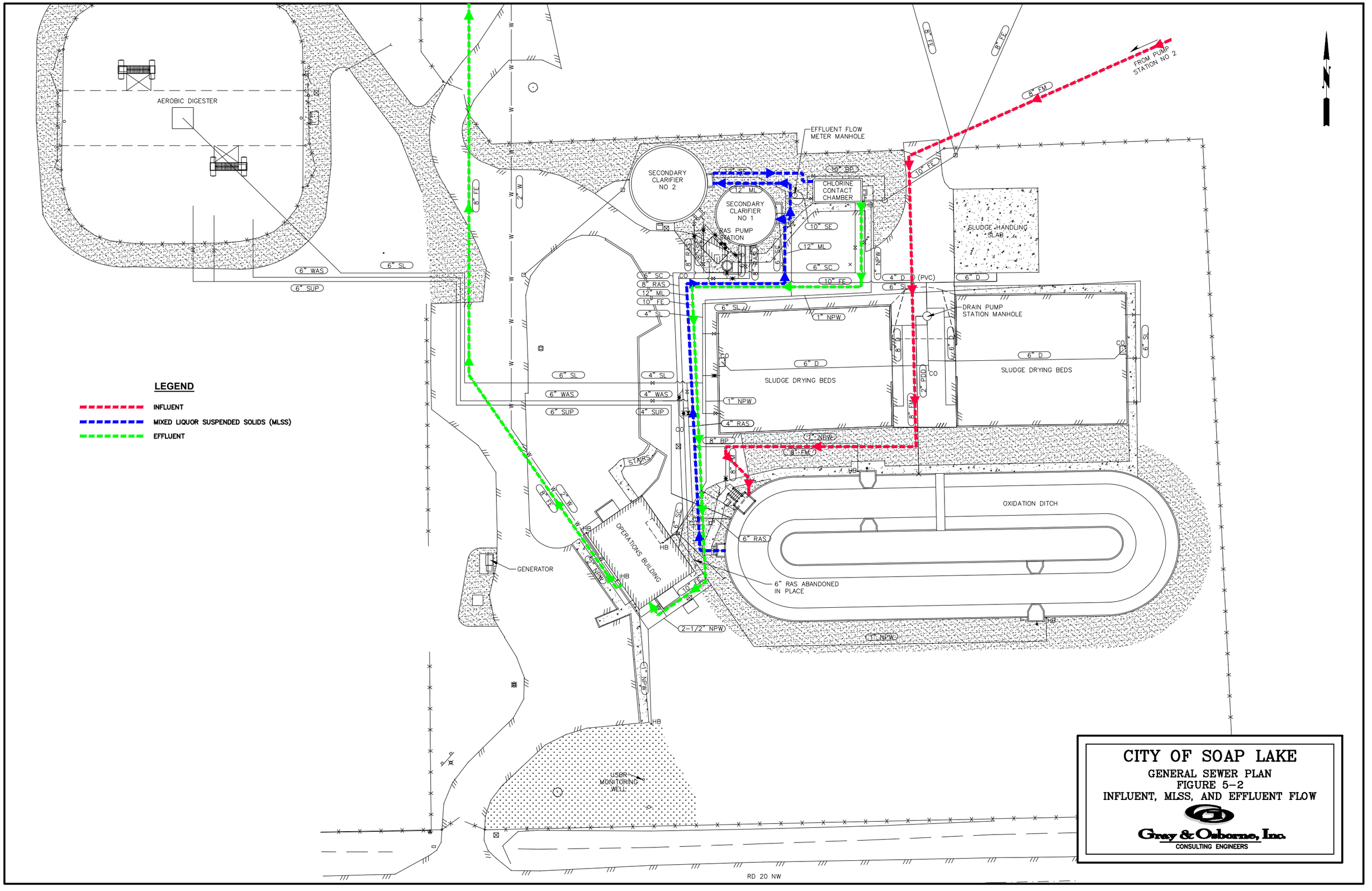
The Engineering Report analyzed the condition of the oxidation ditch. It was concluded that the concrete tank should be sufficient through 2031, although the northeast corner of the ditch may experience spills due to wave action or have a small leak that would require further analysis.



CITY OF SOAP LAKE

GENERAL SEWER PLAN
FIGURE 5-1
SITE PLAN

Gray & Osborne, Inc.
CONSULTING ENGINEERS



CITY OF SOAP LAKE

GENERAL SEWER PLAN
FIGURE 5-2
INFLUENT, MLSS, AND EFFLUENT FLOW

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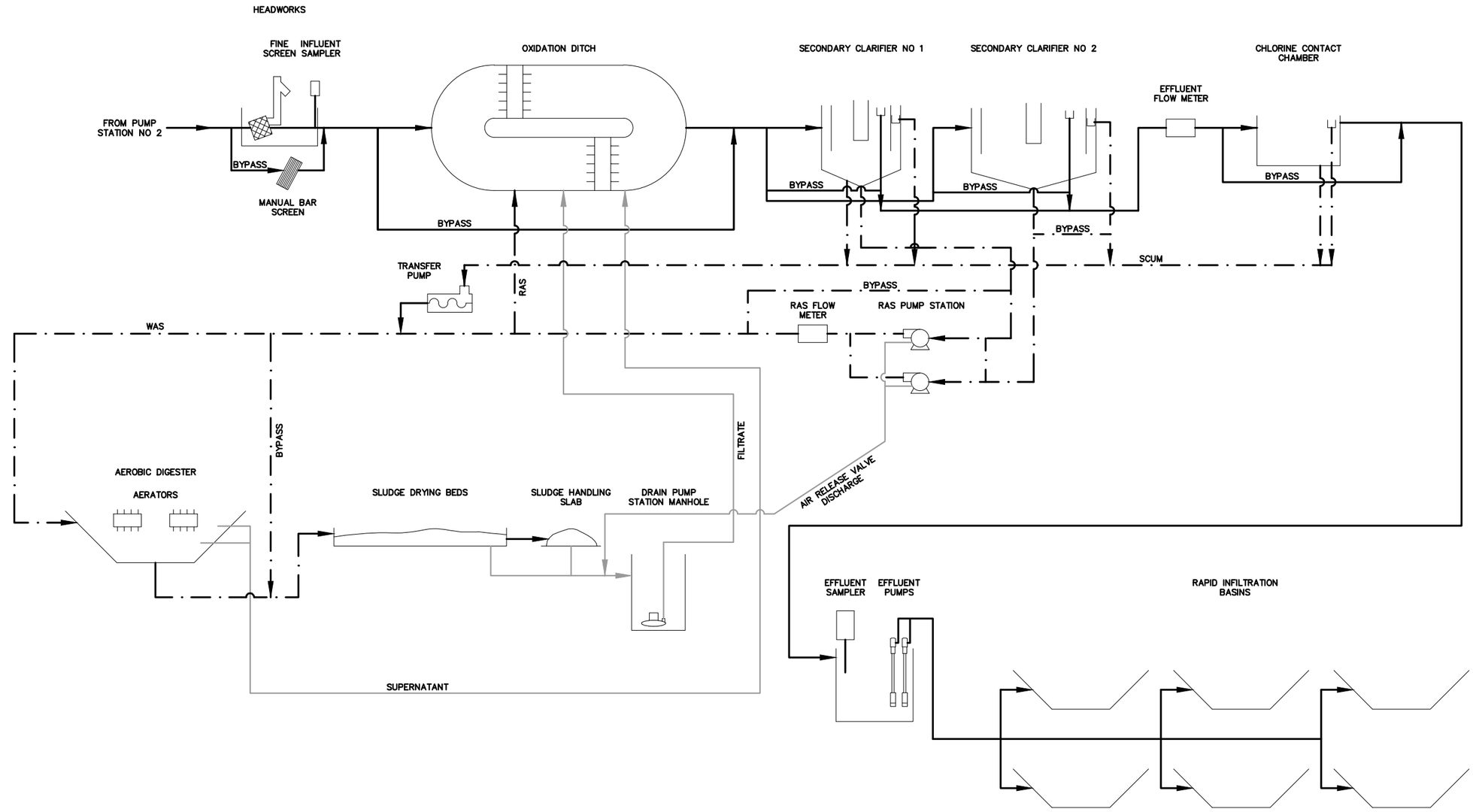

CITY OF SOAP LAKE

GENERAL SEWER PLAN
FIGURE 5-3
PROCESS FLOW DIAGRAM

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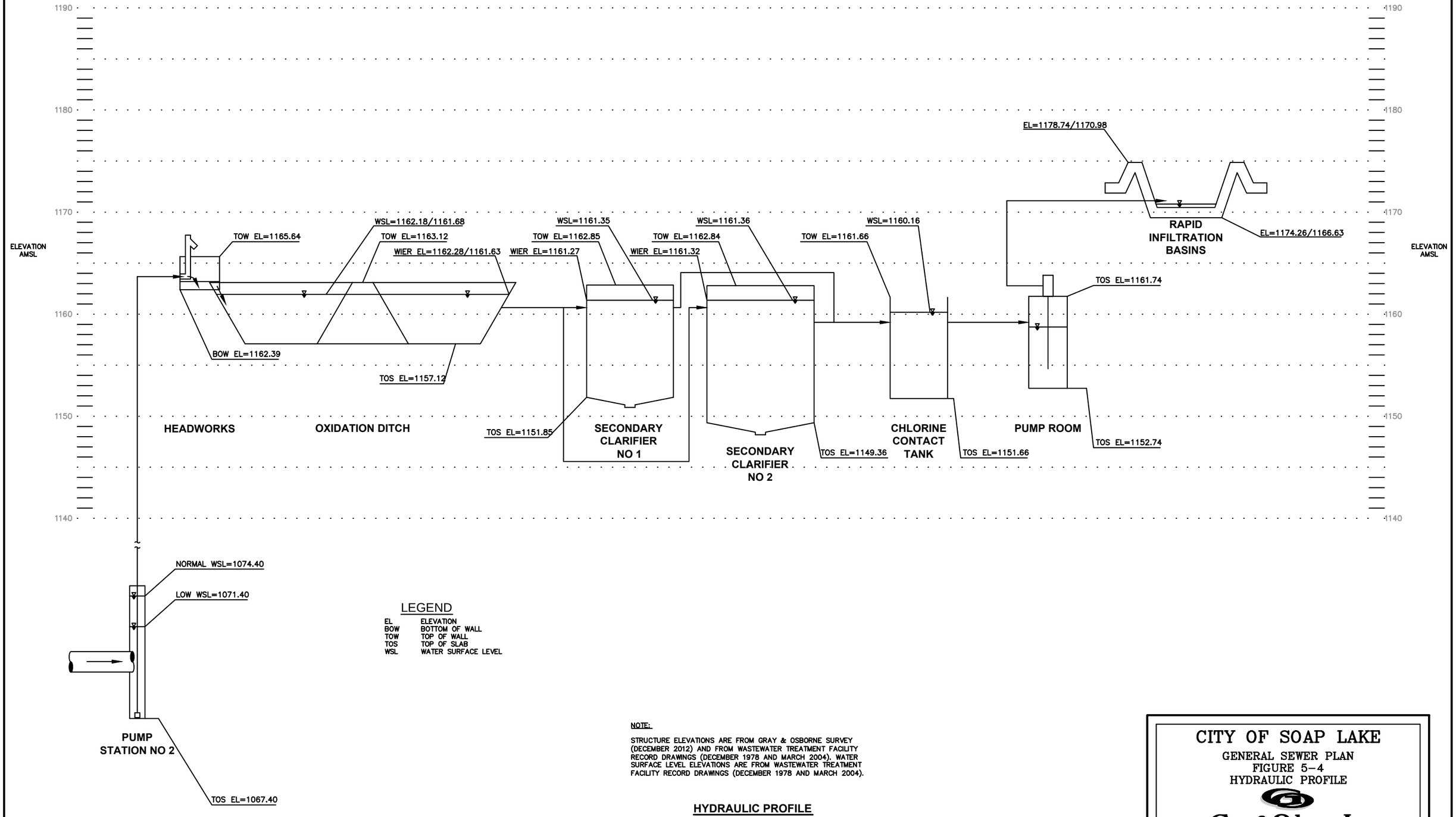
CONSULTING ENGINEERS



LEGEND

EL	ELEVATION
BOW	BOTTOM OF WALL
TOW	TOP OF WALL
TOS	TOP OF SLAB
WSL	WATER SURFACE LEVEL

NOTE:

STRUCTURE ELEVATIONS ARE FROM GRAY & OSBORNE SURVEY (DECEMBER 2012) AND FROM WASTEWATER TREATMENT FACILITY RECORD DRAWINGS (DECEMBER 1978 AND MARCH 2004). WATER SURFACE LEVEL ELEVATIONS ARE FROM WASTEWATER TREATMENT FACILITY RECORD DRAWINGS (DECEMBER 1978 AND MARCH 2004).

HYDRAULIC PROFILE

CITY OF SOAP LAKE

GENERAL SEWER PLAN
FIGURE 5-4
HYDRAULIC PROFILE

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Capacity
The Engineering Report analyzed the treatment capacity of the oxidation ditch through 2031. That analysis is summarized as follows:

- The required aerobic SRT is 8 days
- The oxidation ditch must be operated anoxically 15 hr/day to achieve the required nitrogen removal
- Maximum month WAS production is 558 lb/d in 2031
- Additional aeration volume be required to operate at a MLSS concentration below 4,800 mg/L, as the secondary clarifiers are not designed for this concentration.
- The required SOTR is 204 lb/hr, and the existing rotors can only provide 126 lb/hr.

Design criteria are provided in Table 5-4.

TABLE 5-4

Oxidation Ditch Design Criteria

Oxidation Ditch	
Channel Width	25.5 feet
Center Wall Length	162 feet
Side Water Depth	5 feet
Volume	300,000 gallons
Hydraulic Detention Time @ 0.32 MGD	23 hours
Hydraulic Detention Time @ 0.93 MGD	8 hours
Oxidation Ditch Rotors	
Quantity	2
Rotor Length	14 feet
Rotor Diameter	42 inches
Capacity, each	63 lbs O_2/hour
Motor Size	20 hp
Speed Control	VFD

SECONDARY CLARIFIERS

Process Description
Following biological treatment, effluent from the oxidation ditch flows by gravity into one or both of the two circular secondary clarifiers. The secondary clarifiers provide a quiescent environment where settleable solids are separated from the flow by gravity sedimentation. Settled sludge is transported by mechanically operated rotating rake arms along the floor of the clarifier to a central hopper. Solids are removed from the hopper for return to the oxidation ditch by means of the return activated sludge (RAS) station

located adjacent to the secondary clarifiers. Scum is pumped from the system by a transfer pump located in the Operations Building. Effluent exits the clarifiers by passing over a weir launder located around the center column.

Structural
The Engineering Report analyzed the condition of the secondary clarifiers. It was concluded that the mechanism for Secondary Clarifier 1 should be painted.

Capacity
The Engineering Report analyzed the treatment capacity of the secondary clarifiers through 2031. That analysis is summarized as follows:

- The secondary clarifiers are shallow and have an inefficient peripheral feed design, therefore the clarifiers are assumed to have only 60 percent of rated capacity.
- Due to differing diameters, the appropriate flow split between the clarifiers in the future would be 39-percent of total flow to Secondary 1 and 61-percent to Secondary Clarifier 2 to equalize the surface overflow rates and solids loading rates.
- A splitter box is required that allows greater precision in flow-splitting than a typical splitter box.
- The secondary clarifiers will not have sufficient capacity if the operating MLSS concentration in the oxidation ditch is above 3,000 mg/L at projected 2031 flow rates.
- Bioselectors are recommended to create a better settling sludge, as confirmed by an SVI below 150 mL/g.

Design criteria for the secondary clarifiers are provided in Table 5-5.

TABLE 5-5

Secondary Clarifiers Design Criteria

Secondary Clarifier 1	
Type	Circular, Peripheral Feed, Center Withdrawal
Diameter	28 ft
Side Water Depth	9.5 ft
Surface Area	616 ft^2
50% of Flow (Reliability Assessment)	
MMF Surface Overflow Rate @ 0.16 MGD	260 gpd/ft^2
PHF Surface Overflow Rate @ 0.47 MGD	755 gpd/ft^2
MMF Solids Loading Rate @ 0.32 MGD (1) MLSS 3,000 mg/L	13.0 $lb/ft^2/d$
PHF Solids Loading Rate @ 0.63 MGD (1) MLSS 3,000 mg/L	25.4 $lb/ft^2/d$
39% of Flow (Operational Assessment)	
MMF Surface Overflow Rate @ 0.12 MGD	203 gpd/ft^2
PHF Surface Overflow Rate @ 0.36 MGD	589 gpd/ft^2
MMF Solids Loading Rate @ 0.24 MGD (1) MLSS 3,000 mg/L	10.1 $lb/ft^2/d$
PHF Solids Loading Rate @ 0.48 MGD (1) MLSS 3,000 mg/L	19.8 $lb/ft^2/d$
Motor	0.5 hp

(1) RAS flow assumed as 50 percent of MMF.

Secondary Clarifier 2	
Type	Circular, Peripheral Feed, Center Withdrawal
Diameter	35 ft
Side Water Depth	12 ft
Surface Area	962 ft^2
50% of Flow (Reliability Assessment)	
MMF Surface Overflow Rate @ 0.16 MGD	166 gpd/ft^2
PHF Surface Overflow Rate @ 0.47 MGD	483 gpd/ft^2
MMF Solids Loading Rate @ 0.32 MGD (1) MLSS 3,000 mg/L	8.3 $lb/ft^2/d$

PHF Solids Loading Rate @ 0.63 MGD (1) MLSS 3,000 mg/L	16.3 lb/ft^2/d
61% of Flow (Operational Assessment)	
MMF Surface Overflow Rate @ 0.20 MGD	203 gpd/ft^2
PHF Surface Overflow Rate @ 0.57 MGD	590 gpd/ft^2
MMF Solids Loading Rate @ 0.40 MGD (1) MLSS 3,000 mg/L	10.2 lb/ft^2/d
PHF Solids Loading Rate @ 0.77 MGD (1) MLSS 3,000 mg/L	19.8 lb/ft^2/d
Motor	0.5 hp

(1) RAS flow assumed as 50 percent of MMF.

EFFLUENT FLOW METER

Process Description

A new 6-inch magnetic flow meter with a range of 0-1,320 gpm was installed in the Phase I improvements

CHLORINE CONTACT CHAMBER

Process Description

At present there is no disinfection of the wastewater effluent that is discharged from the WWTF. The City is not required to provide disinfection because the existing permit limits do not include a fecal coliform limit.

Prior to constructing the rapid infiltration basins and removing an effluent spray system from service, the City historically operated a chlorine contact chamber for disinfection. Wastewater still flows through the tank prior to discharge, but no chemicals are added.

Design criteria for the chlorine contact chamber are provided in Table 5-6.

TABLE 5-6

Chlorine Contact Chamber Design Criteria

Chlorine Contact Tank	
Surface Area	180 ft^2
Side Water Depth	10 ft
Volume	13,000 gallons

EFFLUENT PUMPS

Process Description

The effluent pump station pumps effluent from the chlorine contact tank to the rapid infiltration basins for final disposal. The wet well is located in the Operations Building.

Capacity

The Engineering Report analyzed the treatment capacity of the effluent pumps through 2031. That analysis is summarized as follows:

- To meet redundancy requirements, a third effluent pump is required to adequately pump PHF with the largest effluent pump out of service.

Design criteria for the effluent pumps are provided in Table 5-7.

TABLE 5-7

Effluent Pumps Design Criteria

Effluent Pumps	
Quantity	2
Type	Vertical Turbine
Capacity @ TDH	340 gpm @ 44 ft
Motor	5 hp

EFFLUENT SAMPLER

Process Description

The effluent sampler is located in the Operations Building near the effluent pumps and samples effluent flowing to the effluent pump wet well. As recommended in the Engineering Report, the sampler was modified to allow flow-pacing as part of the Phase I improvements.

RAPID INFILTRATION BASINS

Process Description

The City's final effluent is pumped to one of six rapid infiltration basins. During the summer, effluent is applied to a particular basin for 7-9 days, and then flow is switched to the next basin. During the winter, the application period is approximately 9-12 days. The operator has not reported any significant issues with the infiltration basins.

Capacity
The Engineering Report analyzed the treatment capacity of the effluent pumps through 2031. That analysis is summarized as follows:

- The basins are sized to accommodate an effluent flow of 1.45 MGD.
- Assuming the City continues to rotate the beds every 7-12 days and dry each bed for at least 10-16 days between uses, the beds have sufficient infiltration capacity.

Design criteria for the rapid infiltration basins are provided in Table 5-8.

TABLE 5-8

Rapid Infiltration Basins Design Criteria

Rapid Infiltration Basins	
Quantity	6
Floor Dimensions, each	262'0" L x 62'0" W
Side Slope	2:1
Basin Depth	4.5 ft
Volume, each	648,600 gallons
Design Infiltration Rate	6.0 in/hr
Summer Application Period	7-9 days
Winter Application Period	9-12 days
Summer Drying Period	10-15 days
Winter Drying Period	12-16 days
Maximum Nitrogen Loading	10 mg/L

SOLIDS TREATMENT FACILITIES

The City's solids treatment facilities consist of an aerobic digester, sludge drying beds, and a sludge storage pad. The City uses the digester for partial treatment and to reduce sludge volume, and the sludge drying bed process is used to achieve Class B biosolids criteria. Air drying in drying beds is designated by WAC 173-308 as a process to significantly reduce pathogens (PSRP) that is capable of meeting Class B pathogen reduction requirements if the biosolids are dried for a minimum of three months with at least two of the months having an ambient average daily temperature of at least 32°F. Vector attraction reduction requirements are satisfied if the concentration of the volatiles solids in the biosolids is reduced by 38 percent during the digestion process.

Following is an analysis of the solids handling treatment facilities.

RETURN ACTIVATED SLUDGE SYSTEM

Process Description

Return activated sludge (RAS) is pumped from the secondary clarifiers to the oxidation ditch to maintain a concentrated biomass in the oxidation ditch. There are two RAS pumps located in the RAS pump station. The pumps are controlled by operator-adjustable VFDs. The RAS piping was modified to hydraulically isolate the RAS operation of each clarifier as part of the Phase I improvements. The City was provided a spare pump for storage during the Phase I improvements to address reliability requirements.

Capacity

The RAS pump station was constructed as part of the Phase I improvements and is anticipated to have sufficient capacity through 2031.
Design criteria for the RAS pumps are provided in Table 5-9.

TABLE 5-9

RAS Pumps Design Criteria

Return Activated Sludge Pump Station	
Pump Quantity	2
Pump Type	Self-Priming Centrifugal
Design Duty @ TDH, each(1)	135 gpm @ 7 ft TDH
	65 gpm @ 5 ft TDH
	>60 gpm @ 25 ft TDH
Maximum Flow @ 7 ft TDH	375 gpm
Maximum Flow @ 25 ft TDH	230 gpm
Motor Size	3 hp
Speed Control	VFD
RAS Flow Meter	
Type	Magnetic
Size	4 inch
Range	0 –590 gpm
Vault diameter	4 feet

(1) Refer to manufacturer pump curve for capacity.

AEROBIC DIGESTER

Process Description

The solids that are not returned to the activated sludge process (oxidation ditch) from the clarifiers are called waste activated sludge (WAS) and are pumped to the aerobic digester. The ability to remove, stabilize, and dispose of WAS from the treatment process is one of the major factors which determines the capacity of the treatment plant. There are three fundamental elements in the State biosolids management regulations that

establish the minimum criteria for biosolids disposal: pollutant concentration (primarily metals), pathogen reduction, and vector attraction. Currently, the Soap Lake WWTF meets the state requirements for pollutant concentration, pathogen reduction, and vector attraction for Class B biosolids. The solids are currently hauled off site to a permitted facility for final disposal.

The Soap Lake digester is a lined, open-air basin. Depending on the water surface elevation, the basin water depth ranges from 7 to 12 feet, and the volume ranges from 240,000 to 570,000 gallons. Biosolids flow out of the basin by gravity to the sludge drying beds from a pit on the bottom of the basin. The digester is equipped with two floating brush rotor aerators that are designed to mix the contents and transfer oxygen into the digester to promote biological degradation of the solids.

Capacity

The Engineering Report analyzed the treatment capacity of the aerobic digesters through 2031. That analysis is summarized as follows:

- New aerators were required to replace an aeration technology that was not compatible with tumbleweeds and rags. The City replaced the aerators as part of the Phase I improvements to meet mixing and aeration requirements.
- The digesters have sufficient tank capacity to adequately meet a 60-day MCRT through 2031 if a decanter is installed to increase solids concentration in the digester to 1.5 percent.
- The digester analysis was performed assuming a volume of 240,000 gallons due to the infrequent dosing to the sludge drying beds and need to increase sludge holding time during colder months to adequately digest solids.

Design criteria for the aerobic digester are provided in Table 5-10.

TABLE 5-10

Aerobic Digester Design Criteria

Aerobic Digester	
Floor Dimensions	52 ft long, 52 ft wide
Side Slope	2:1
Basin Depth	7 ft (LWL) to 12 ft (HWL)
Volume	240,000 gal to 570,000 gal
Floating Brush Rotor Aerators	
Quantity	2
Type	Floating Brush Rotor
Rotor Length	10 feet
Rotor Diameter	35 inch
Capacity, each	41 lbs O_2/hr
Motor Size	15 hp

SLUDGE DRYING BEDS

Process Description

The drying beds consist of shallow, paved structures that allow the sludge to dry. Perforated drain pipe beneath the beds allows water to drain from the beds, further dewatering the sludge while evaporation occurs. Dried biosolids are stored on the solids storage slab and taken to the Boulder Park facility in Mansfield, WA for land application as Class B biosolids.

Capacity

The Engineering Report analyzed the treatment capacity of the sludge drying beds through 2031. That analysis is summarized as follows:

- The required drying bed area for the design year of 2031 is 12,000 ft^2. The City has approximately 9,500 ft^2 of drying beds, therefore is recommended that the City construct additional drying beds or add polymer to the digested sludge to increase the drainage efficiency of the sludge.
- The drying beds needed to be paved, as the previous sand surface was an O&M issue for the City. This work occurred as part of the Phase I improvements.
- The drying bed valving needed to be replaced, which occurred as part of the Phase I improvements.

Design criteria for the sludge drying beds are provided in Table 5-11.

TABLE 5-11

Sludge Drying Beds Design Criteria

Sludge Drying Beds	
Quantity	2
Dimensions	81'0" L x 56'6" W
Total Area	9,500 ft^2

DRAIN PUMP STATION

The liquid that drains from the sludge drying beds enters a manhole located on the north end of the walkway between the beds. When the manhole fills, a submersible pump in the manhole pumps the sludge drying bed filtrate into the oxidation ditch. This pump was replaced during the Phase I improvements and its design criteria are shown in Table 5-12.

TABLE 5-12

Drain Pump Design Criteria

Drain Pump Station	
Manhole Diameter	4 ft
Pump Quantity	1
Pump Type	Submersible
Capacity @ TDH	74 gpm @ 25 ft TDH
Motor	0.5 hp

MISCELLANEOUS

NONPOTABLE WATER SYSTEM

The WWTF currently uses City potable water throughout the facility for uses that do not require City potable water. It was recommended in the Engineering Report that the City install a nonpotable water system to use WWTF effluent instead of City potable water. It was also recommended that the internal site piping be modified to provide proper cross connection control. City potable water enters the WWTF through a backwash prevention assembly, and is properly isolated; however there is not subsequent backflow prevention downstream of the assembly, as recommended in the Department of Ecology Criteria for Sewage Works Design. For example, the lab wash water should be separated from the bathroom wash water with a backflow prevention device.

OPERATIONS BUILDING

The Operations Building appears to be in good condition, and City personnel have confirmed that the building is suitable for continued use.

ELECTRICAL SERVICE

The plant electrical distribution system was upgraded from a 240/120 volt, 3-phase 4-wire distribution system to a 480V service in the Phase I improvements. This service is provided by Grant County PUD. The electrical service feeds dual motor control centers for the facility through a 400 amp circuit breaker. The circuit breaker and motor control centers are located in the Operations Building. The motor control centers feed panels which subsequently provide power to ancillary systems and lighting throughout the facility. A 125 kW generator provides backup power to the motor control centers though two dedicated automatic transfer switches.

According to the City's SWD permit the City must ensure that adequate safeguards prevent the discharge of untreated wastes or wastes not treated in accordance with the requirements of the permit during electrical power failure at the treatment plant. Adequate safeguards include, but are not limited to alternate power sources, standby generator(s), or retention of inadequately treated wastes. An emergency generator was provided in the Phase I improvements to provide electricity for plant operation during power outages.

SUMMARY

The City completed a comprehensive analysis of the WWTF in the Engineering Report, and although subsequent flows and loadings and review of growth projections may have changed the timeline for when various improvements may be necessary, the recommendations in that report have not changed. Due to the recent completion of the Phase I improvements, it is not likely that the City will desire to complete another project within the next six years. Furthermore, as addressed previously, the City has not grown at the rate that was previously projected, and it may be possible to delay the completion of the Phase II improvements as a result. Therefore, Table 5-13 summarizes the recommended Phase II improvements and whether growth is a contributing factor in the need for each improvement. As shown in Table 5-1, the estimated cost for the Phase II improvements is $1,534,000.

TABLE 5-13

Phase II Improvement Summary

Improvement	Reason for Improvement	Related to Growth
Modification of Influent Sampler	Not flow-paced	No
Bioselectors	Poor settling sludge	No
Nonpotable Water System	City uses potable water for all water needs at WWTF, including those that do not require potable water	No
Paint Secondary Clarifier 1	Mechanism is in need of re-coating	No
Anoxic Basin	Increase nitrogen-removal capacity of WWTF	Yes
Secondary Clarifier Splitter Box	Secondary clarifiers cannot be run in parallel	Yes
Additional Sludge Drying Beds	Projected sludge production is greater than dewatering capacity of existing drying beds	Yes
Floating Aerator in Oxidation Ditch	Projected oxygen requirements of biological process are greater than capacity of existing rotors	Yes
Floating Decanter in Aerobic Digester	Projected sludge production is greater than capacity of existing aerobic digester without thickening	Yes
Additional Effluent Pump	Projected effluent flowrate requires both effluent pumps to be used at PHF, and no redundant pump is installed.	Yes

CHAPTER 6

CAPITAL IMPROVEMENT PLAN

INTRODUCTION

This chapter presents a plan for financing the capital improvements recommended in the previous chapters in the report. This chapter includes a review of the City's current financial status, available revenue sources, allocation of revenues, and the impact of the recommended capital improvement plan on sewer rates.

EXISTING SERVICE RATES AND CONNECTION CHARGES

The City collects revenue through connection charges and service rates that are annually, or more often if necessary, established by resolution (SLMC 13.14.290). The City's Sewer Service System section in its Municipal Code is in Appendix A. Service rates are based on the designated class of user. The base monthly rate per ERU is $43.93. Each commercial service is charged a base charge of $34.40 per month plus a usage charge of $1.56 for each 100 cubic feet of potable water usage. It is City policy to consider a rate increase at the beginning of each year to address inflation.

The City's current connection charge for a single connection to the City's main is $250.00 plus the costs of materials and repairs to infrastructure.

HISTORICAL OPERATIONS

Sewer utility revenues, expenditures, and the resulting effects on water utility cash and investments for the years 2011-2015 are summarized in Table 6-1.

TABLE 6-1

Historical Revenues and Expenditures

Revenues	**2011**	**2012**	**2013**	**2014**	**2015**
Beginning Balance	$167,452.74	$175,368.64	$229,592.24	$290,060.42	$259,696.12
State Generated Revenues	$0.00	$21,977.42	$0.00	$2,022.58	$31,000.00
Charges for Services	$286,218.85	$321,893.43	$367,434.93	$388,548.56	$404,062.18
Other Revenues	$12,266.60	$0.00	$546.35	$2,896.50	$29,408.89
Total Revenue	**$298,485.45**	**$343,870.85**	**$367,981.28**	**$393,467.64**	**$464,471.07**
Expenditures					
Sewer Operation	$207,496.74	$196,209.22	$186,986.93	$206,654.97	$171,825.76
Professional Services	$14,669.49	$30,734.71	$40,090.61	$85,122.88	$38,139.43
Loan Repayment	$57,003.32	$57,003.32	$57,003.32	$83,238.31	$183,705.23
Capital Expenditures	$0.00	$0.00	$0.00	$45,797.03	$65,791.74
Interfund Transfers	$11,400.00	$5,700.00	$5,700.00	$1,800.00	$23,552.40
Total Sewer	**$290,569.55**	**$289,647.25**	**$289,780.86**	**$422,613.19**	**$483,014.56**
Other	$0.00	$0.00	$17,732.24	$0.00	$13,606.58
Total Expenditures	**$290,569.55**	**$289,647.25**	**$307,513.10**	**$422,613.19**	**$496,621.14**
Net Revenues					
Net Revenues	**$7,915.90**	**$54,223.60**	**$60,468.18**	**-$29,145.55**	**-$32,150.07**

Sewer Revenue

In the table, the "Beginning Balance" is the amount listed on the City's budget. "State Generated Revenues" include funding from sources such as Department of Commerce CDBG grants. In 2012 and 2014, "State Generated Revenues" reimbursed the City for the Engineering Report through a CDBG Planning Only Grant. "Charges for Services" includes both monthly service charge and sewer connection charges. Sewer connection charges typically contribute less than $1,000 per year. "Other Revenue" includes revenue generated by other sources, such as insurance recovery or investment interest. In general, sewer revenues have increased over the past five years.

Sewer Expenditures

The "Sewer Operation" expense covers the annual cost of operating the system, including operator and administration salary and benefits, office supplies, utility costs, insurance, vehicle maintenance, permits and fees, and other miscellaneous costs. "Professional Services" includes the cost of engineering and legal consultation. "Loan Repayment" is the annual amount the City is paying to funding agencies for loans taken for previous projects. The City has begun to repay debt to Public Works Trust Fund and USDA Rural Development for the Phase I improvements to the WWTF and the Main Avenue and Division Street sewer replacement. The remaining balance and term of each of the City's loans is as follows:

- Department of Ecology Loan: #L030028A - $362,218.09 (2024)
  #L030028B - $4,243.48 (2024)
  #L0100001 - $83,507.81 (2021)
  #WQC-2015 - SoaLak-00020 - $25,500 (2020)
- Public Works Trust Fund: PC91-961-066 - $1,383,208.98 (2032)
- USDA Rural Development: #92-07 - $483,992.56 (2054)

"Capital Expenditures" includes the capital cost of new construction such as sewer improvements or purchases such as office equipment. "Interfund Transfers" includes amounts transferred from the sewer fund to reserves. Sewer operation expenditures have stayed relatively consistent over the last five years.

The City collects a utility tax on sewer charges. This tax is typically transferred to the General Fund and has the same revenue and expense on the City's sewer budget and is therefore not shown in Table 6-1.

CAPITAL IMPROVEMENT PROGRAM

This section provides a schedule and financing plan for the wastewater collection and treatment system needs that have been identified in previous chapters of this report. Table 6-2 summarizes the timing and the cost of capital improvements the City proposes for the 6- and 20-year planning periods. It is recommended that the City perform improvements within the same year in order to facilitate funding requirements and to achieve more favorable prices through economy of scale. Table 6-3 is a 6-year financing plan for the City's operating fund that outlines projected revenues and expenditures, existing and projected debt service, and the amount of additional revenues required to meet projected debt service. Capital improvement costs have been adjusted for inflation at 3 percent per year in Table 6-3.

TABLE 6-2

Capital Improvement Plan

Improvement	Current Cost	2016	2017	2018	2019	2020	2021	2022-2035
New 8-Inch Sewer from MH C-67 to MH C-62 along 3rd Ave NE	$260,000				x			
New 8-Inch Sewer from MH A-2 to MH A-4 along Lakeshore Drive	$226,000				x			
New 8-Inch Sewer from MH A-6 to MH A-7 along Fir Street	$116,000				x			
New 8-Inch Sewer from MH A-26 to MH A-38 along Main Street West	$260,000				x			
New 10-Inch Sewer from MH B-34 to MH B-40 along SR 17	$143,000							x
New 8-Inch Sewer from MH C-10 to MH C-12 along East Beach Park	$147,000							x
New 8-Inch Sewer from MH A-7 to MH A-10/ New 12-Inch Sewer from MH A-13 to Lift Station 2 along 1st Ave NW	$457,000							x
Video Evaluation of Remainder of Collection System	$200,000							x
Additional Sewer Main Replacement	$4,200,000							x
Wastewater Treatment Facility Upgrades, Phase II	$1,534,000							x
Sewer Jet Truck	$100,000							x
Total	**$7,643,000**							

TABLE 6-3

Operating Fund – Six Year Financing Plan

CAPITAL PROJECTS	2016	2017	2018	2019	2020	2021
3rd Ave NE			$275,800.00			
Fir Street			$123,100.00			
Main Street West			$275,800.00			
Lakeshore Drive			$239,800.00			
Total Capital Projects	**$0.00**	**$0.00**	**$914,500.00**	**$0.00**	**$0.00**	**$0.00**
REVENUES						
State Generated Revenues(1)	$0.00	$0.00	$914,500.00	$0.00	$0.00	$0.00
Charges for Services(2)	$404,000.00	$404,000.00	$404,000.00	$404,000.00	$404,000.00	$404,000.00
From Increased Rates(3)	$0.00	$12,928.00	$26,269.700	$40,038.33	$54,247.55	$68,911.47
Total Revenue	**$404,000.00**	**$416,928.00**	**$1,344,769.70**	**$444,038.33**	**$458,247.55**	**$472,911.47**
EXPENDITURES						
Sewer Operation(4)	$200,000.00	$206,000.00	$212,200.00	$218,600.00	$225,200.00	$232,000.00
Total Expenditures	**$200,000.00**	**$206,000.00**	**$212,200.00**	**$218,600.00**	**$225,200.00**	**$232,000.00**
DEBT SERVICE						
Department of Ecology Loans	$57,003.32	$57,003.32	$57,003.32	$57,003.32	$57,003.32	$57,003.32
PWTF/USDA RD Loan	$126,701.91	$126,701.91	$126,701.91	$126,701.91	$126,701.91	$126,701.91
New Debt Service(5)			$56,000.00	$56,000.00	$56,000.00	$56,000.00
Total Debt Service	**$183,705.23**	**$183,705.23**	**$239,705.23**	**$239,705.23**	**$239,705.23**	**$239,705.23**
INDICATORS						
Net Revenues	$20,294.77	$27,222.77	-$21,635.53	-$14,266.90	-$6,657.68	$1,206.24
Sewer Rate Increase(6)	0.0%	3.2%	6.5%	9.9%	13.4%	17.1%
Residential Rate	$43.93	$45.34	$46.79	$48.28	$49.83	$51.42

(1) State generated revenues include grants and loans as further discussed in Chapter 6.
(2) Conservatively assumes no growth in number of connections.
(3) Assumes increasing rates at 3.2 percent each year from 2017-2021.
(4) Estimated annual sewer operation of $200,000 based on average cost shown in Table 6-1. Costs for professional services are included in the capital expenditures for each project. Expenditures are assumed to increase with inflation of 3 percent.
(5) New debt is assumed to be taken at a 2 percent interest rate with a 20 year loan.
(6) Increase from 2016 rate.

Table 6-3 shows that in order to fund the capital improvements identified in this plan, sewer rates need to be raised. Assuming that projects are funded through loans with a 2.0 percent interest rate and a 20-year term, the City must raise rates by about 3.0 percent each year from 2017-2021 to complete the recommended projects. In order to continue to replace the collection system and perform other 20-year improvements, such as upgrades to the WWTF, the City would need to continue to raise rates after this 6-year period.

REGULATORY CONSIDERATIONS

None of the proposed projects will be constructed on federal lands, but if the projects are funded through a Department of Commerce CDBG General Purpose Grant or USDA Rural Development, which do include a federal funding component, it will be necessary to complete an environmental report meeting the requirements of the National Environmental Policy Act (NEPA). Ecology requires funding recipients to complete both the State Environmental Review Process (SERP) and a cross-cutter report equivalent to a NEPA. A State Environmental Policy Act (SEPA) checklist covering the projects is required and is included in Appendix B.

FUNDING SOURCES

The following section describes several funding sources available to the City. According to the 2009-2013 American Community Survey 5-Year Estimates, Soap Lake's Median Household Income is $22,000. The City's current base sewer rate is $43.93. This leads to an Affordability Index, defined as the base residential sewer rate divided by average monthly income, of 2.4 percent. This Affordability Index may qualify the City for grants, forgivable principal loans, and low-interest loans.

DEPARTMENT OF COMMERCE CDBG GENERAL PURPOSE GRANT

The Department of Commerce administers the Community Development Block Grant (CDBG) General Purpose Grant Program. This program makes funds available annually through a competitive application process to assist Washington cities, towns, and communities. Eligible activities include "public facilities such as water, wastewater, and streets." A main emphasis of this program is to provide services to low- and moderate-income persons. The demographics of Soap Lake make the City eligible for this program. Maximum grant amounts are $750,000 or $1 million depending on specific criteria.

DEPARTMENT OF ECOLOGY STATE REVOLVING FUND

Ecology administers the State Revolving Fund (SRF) program, which makes no- and low-interest loans available to communities with qualifying projects. Application for these funds is through Ecology's annual funding cycle in the fall. SRF loans are available for planning, design, and construction projects. Loans are available for terms up to 20 years at interest rates that are calculated at 60 percent of the average municipal bond interest rate. For qualifying low-income communities, zero percent loans can be made available. SRF

funding is derived from the federal government, and consequently requires an environmental report called a cross-cutter report, which has similar requirements to a NEPA.

USDA-RURAL DEVELOPMENT

The USDA Rural Development agency (RD) has a loan program which, under certain conditions, includes a limited grant program. Grants may be awarded when the average user rate exceeds 1.5 percent of the median household income. Loans are offered at interest rates of around 2.0 to 3.0 percent at terms up to 40 years. Because RD is a federal funding program, an environmental report meeting the requirements of NEPA is required. The City received grant and loan funding from RD following a funding application in 2013 for replacement of the Main Avenue and Division Street sewer main.

REVENUE BONDS

Another source of funds for construction of major utility improvements is the sale of revenue bonds. The City would issue the tax-free bonds. The major source of funds for debt service on these revenue bonds is from sewer service rates. In order to qualify to sell revenue bonds, the City must show that its net operating income (gross income less expenses) is equal to or greater than a debt coverage factor times the annual principal and interest payments due for all outstanding bonded indebtedness. The debt coverage factor is applicable to revenue bonds sold on the commercial market. The City's bond writer will set the debt coverage factor and it may vary from 1.2 to 1.4.

GENERAL OBLIGATION BONDS

The City, by special election, may issue general obligation bonds to finance almost any project of general benefit to the City. Assessments levied against all privately owned properties within the City will pay for the bonds. This includes vacant property that otherwise would not contribute to the cost of such general improvements. This type of bond issue is usually reserved for municipal improvements that are of general benefit to the public, such as arterial streets, bridges, lighting, municipal buildings, firefighting equipment, parks, and water and wastewater facilities. Because the money is raised by assessment levied on property values, the business community also provides a fair share of funds to pay off such bonds.

General obligation bonds have the best market value and carry the lowest interest rate of all types of bonds available to the City.

Disadvantages of general obligation bonds include the following:

- Voter approval is required which may be time-consuming, with no guarantee of successful approval of the bond.
- The City would have a practical or legal limit for the total amount of general obligation debt. Financing large capital improvements

through general obligation debt reduces the ability of the utility to issue future debt for projects such as parks and community facilities that cannot be directly funded through enterprise funds.

UTILITY LOCAL IMPROVEMENT DISTRICTS

Another potential source of funds for improvements comes through the formation of Utility Local Improvement Districts (ULIDs) involving an assessment made against properties benefited by the improvements. ULID bonds are further guaranteed by revenues and are financed by issuance of revenue bonds. ULID financing is frequently applied to sewer system extensions into previously unserved areas. Typically, ULIDs are formed by the municipality at the written request (by petition) of the property owners within a specific area of the municipality. Upon receipt of a sufficient number of signatures on petitions, the local improvement area is defined, and a sewer system is designed for that particular area in accordance with the municipality's general comprehensive plan. Each separate property in the ULID is assessed in accordance with the special benefits the property receives from the sewer system improvements.

DEVELOPER FINANCING

Developers may fund the construction of extensions to the sewer system to property within new plats. The developer extensions are turned over to the City for operation and maintenance when completed.

It may be necessary, in some cases, to require the developer to construct more facilities than those required by the development in order to provide either extensions beyond the plat and/or larger pipelines for the ultimate development of the sewer system. The City may, by policy, reimburse the developer through direct outlay, latecomer charges, or reimbursement agreements for the additional cost of facilities, including increased size of pipelines over those required to serve the property under development. Construction of any pipe in commercial or industrial areas that is larger than the size required to serve the development should also be considered as an oversized line possibly eligible for compensation.

COMMUNITY ECONOMIC REVITALIZATION BOARD (CERB)

CERB is administered through the Department of Commerce and provides funding to local governments for public infrastructure which supports private business growth and expansion. Eligible projects for CERB funding include domestic and industrial water, storm water, wastewater, public buildings, telecommunications and port facilities, among others. CERB can provide funding for the following opportunities:

- Committed Private Partner Program: A private business or development is ready to occur and is contingent on approval of CERB funds. The project will create a significant number of permanent jobs or generate significant private capital investment. The median hourly wage of private sector jobs

created after the project is completed must exceed the countywide median wage. Up to $300,000, or 50 percent of the total award, whichever is less, may be awarded as grant, with a 20 percent cash match required.

- Planning Projects: Limited funds are available to fund studies which evaluate high priority economic development projects. Priority is given to applications which could ultimately result in a type of project eligible for CERB construction funds. Up to $50,000 may be awarded as grant and a 25 percent cash match is required.
- Prospective Development Construction Program: Rural communities may receive loans and grants for public infrastructure to enable future business development. The City would be eligible for this program if an economic feasibility study demonstrated that private business development is likely to occur as a result of the public improvements. As with the Committed Private Partner Program, the development would need to lead to significant job creation, and it must be demonstrated that the applicant has no other feasible funding alternative. Up to $300,000, or 50 percent of the total award may be awarded as grant, with a 50 percent cash match required.

GENERAL FACILITY CHARGE

A General Facility Charge (GFC) is a charge to connect to and purchase capacity in the sanitary sewer system and to address the added demand placed upon the system. A GFC is intended to cover the cost of developing the necessary capital facilities to support the expanded capacity. A GFC is typically charged when a new development connects to a City's system or expansions of a development necessitates additional capacity. A GFC study can be performed to evaluate recommended GFC charges for expansions to the system.

APPENDICES

APPENDIX A

SEWER RATES AND MUNICIPAL CODE

Chapter 13.14
SEWER SERVICE SYSTEM

Sections:

13.14.010 Application for service.

A. It is the intent of the city that all utility deliveries, whether water, sewer, garbage or some combination thereof, shall be deliveries of services and/or utilities to the property served. All such delivery of utilities and/or services shall be a claim against the property and a claim against the owner of that property served or furnished utilities and/or services. It shall be the responsibility of each property owner served by city utilities to determine the extent of utility services and deliveries being made and/or furnished to the owner's property. It shall be the responsibility of the property owner to pay all claims, charges, penalties and/or costs imposed by the city for the furnishing and/or delivery of utilities and/or services to the owner's property. The property owner's responsibility shall exist independent of any claim of lien the city may have or make pursuant to any statute, rule or regulation. The fact the owner has directed or allowed the billings for utilities furnished and/or services delivered to the owner's property to be delivered to a tenant or other third person does not in any way reduce or extinguish the property owner's responsibility for water, sewer and/or garbage billings, charges, costs or penalties imposed by the city. All delinquent charges for water, sewer, garbage or some combination thereof shall bear interest at the maximum rate allowed by law.

B. All applications for residential water service shall be made by the property owner of the property to be delivered water service, and responsibility for billing payment shall be borne by the property owner. All charges for water service will be sent directly to the property address unless the property owner directs otherwise. No charge will be made for meter reading for closing accounts, except as provided in this chapter.

C. Applications for industrial and commercial water service may be by the property owner, lessee or other consumer. However, a deposit, as determined by the rate schedule based on estimated use, will be required of such account in lieu of the deposit required under SLMC 13.18.060.

D. Upon a failure to pay the charges for water service, the amount thereof shall become a lien against the real property furnished the service as provided by law.

E. The city of Soap Lake has a combined utility system. All billings to a property for utility services are combined utility billings. To the fullest extent permitted by law, all payments received from a customer for utility services shall be credited first to charges for account changes, next to interest charges, if any, next to penalty charges, if any, next to garbage charges, if any, next to sewer charges, if any, and last to water charges, if any. A delinquency in payment for any utility service to the subject property may result in the termination of any other utility service to the subject property. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.020 Connections required.

All property within or without the limits of the city of Soap Lake, which receives city water, unless exempted as provided in SLMC 13.14.090, shall be required to be connected to the city sewerage system. All property within the city of Soap Lake shall be connected to the city sewerage system if the property supports, houses or contains any source of effluent, discharge or sewerage which, in the opinion of the city, constitutes a threat to the health or safety of the city. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.030 Building sewers.

A. The property owner shall be responsible for installation and maintenance of all building sewers upon the owner's property and the connecting of the sewer to the city sewer system by the city's forces as set forth in SLMC 13.14.040. A separate and independent building sewer shall be provided for every building, except that separate buildings which are an integral part of a single business or industry may be served by a single sewer if allowed by the city.

B. Building sewers which are connected to the city system shall be designed and constructed in accordance with the requirements of the Washington State Building Code and all other applicable rules or regulations. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.040 Connection permit.

A. No unauthorized person shall uncover, make any connections with or opening to, use, alter or disturb any portion of the sewer system or appurtenance thereof without first making application and receiving written permission from the city or the city's designee. The permit application shall be supplemented by any plan, specifications, or other information considered pertinent in the judgment of the public works department. A permit and inspection fee will be required as set forth in Appendix S attached to the ordinance codified in this chapter and found at the end of this chapter.

B. The applicant for the building sewer permit shall notify the public works department when the building sewer is ready for inspection in connection with the city's sewer. The connection of the private sewer to the city sewer shall be inspected by the public works department.

C. The permit fee required before a connection to the city sewerage system shall be set forth in Appendix S. The sum shall be paid to the city clerk prior to the issuance of any permit. If the actual cost of any materials, labor and inspection services provided by the city is determined by the city to be in excess of the fee set forth in Appendix S, the city shall cause a billing for the actual costs in excess of the stated fee together with 16 percent for indirect costs to be directed to the permit applicant. Those charges shall become a utility services lien if not paid, and the city may proceed to withhold water service to the property to enforce its lien as well as proceed to file a sewer lien. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.050 Street restoration.

Where it is necessary to remove street pavement, curb and gutter, sidewalks or gravel streets or to install sewer service line, the property owner shall deposit funds with the city in the estimated amount of the cost of restoring the improvements to their original condition.

The city will make the necessary repairs upon completion of the installation of the service connection and deduct the actual cost of the repairs from the cash deposit. If the cost of repairs exceeds the amount of the deposit, the property owner shall be billed for the balance, which shall become a lien against the property, collectable in the same manner as other unpaid sewer charges. If the cost of repairs is less than the estimated deposit, the excess shall be returned to the property owner. Temporary patches shall be placed at the expense of the owner, if deemed necessary by the city. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.060 Right of inspection.

The duly authorized employees of the city are permitted to enter all properties during normal business hours, or at a time agreed to between the city employee and the property occupant or owner, for the purpose of inspection, observation, measurement testing and testing in accordance with the provisions of this chapter. In an emergency, the city employee may enter to prevent harm to the city system, the service location premises or other property. A city employee should only make entry upon the service location premises pursuant to this section after notifying the public works director of the need for the entry. The public works director shall approve the entry. Contact with the occupant or owner of the premises shall be made personally or by telephone. If contact cannot be made by telephone or in person, then a notice shall be posted on the property and mailed to the utility billing address indicating the date and time of the proposed entry which shall be at least three business days after the mailing of the notice. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.070 Shut-off for refusing entry.

If any owner or occupant on any premises supplied with city water violates any provision of SLMC 13.14.060, the city may shut off the service; and the owner or occupant shall be required to pay all delinquent and unpaid charges against the premises, together with the charge for shutting off and turning on the water, before service may again be turned on. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.080 Septic tanks.

Septic tanks shall not be allowed within the city. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.090 Exceptions to connection requirement.

A. The following shall constitute exceptions to the requirement of SLMC 13.14.020 that all properties receiving city water shall be connected to the city sewerage system:

1. Any property which receives city water but upon which there are no buildings;

2. Any property which receives city water and upon which there are buildings that are not used for domestic purposes and to which the water system is not connected;

3. Any property which receives city water and upon which there are buildings to which the city water is connected but which do not require connection to the city sewerage system; provided, however, said lots will only be exempt from the requirements of SLMC 13.14.020 after application has been made to the city council and a sufficient showing made to the council as to why the property should not be required to be connected to the city sewerage system;

4. As to any lots located in a short plat or major plat, where a deferral to the installation of sewer mains was granted due to topography of the plat requiring installation of a lift station, the use of septic tank systems may be permitted upon demonstrating to the city council that the use of such systems will not cause groundwater contamination. Such exemption shall be permitted to continue, if granted, until the deferral is called to be completed or more than 10 lots exist within a radius of 2,000 feet of the lot where the septic tank is located, whichever occurs first.

B. Any property located within 200 feet of a city sewer main shall be required to connect to that sewer main and extend such main through their property. Any property located more than 200 feet from a city sewer main shall be exempt from such requirement until such time as a city sewer main shall be located within 200 feet of that property. At such time the requirement to connect to and extend the sewer main stated herein shall apply.

C. Any property which is exempted from the requirements of SLMC 13.14.020 by subsection (A)(4) of this section shall be assessed a fee per month as a charge in lieu of fees which would be collected if the lot were serviced by the city sewerage system and such fee is set forth in Appendix S. In determining whether or not to grant such an exemption, the city council shall consider the effect such exemption would have upon city revenue, health, sanitation and/or comprehensive planning. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.100 Sewer rates.

Sewer rates for use of the city sewer system shall be as set forth in Appendix S. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.110 Minimum charges – When.

Once the city has been informed that a building is occupied and using the city sewer system, the minimum sewer charge shall be made each month and shall continue to be made each month until written proof acceptable to the city is delivered to the city from the owner establishing that the sewer service has been terminated. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.120 Payment of account – Delinquent utility accounts.

A. Payment of utility accounts and delinquent utility accounts shall be consistent with the requirements and process as outlined in SLMC 13.18.070.

B. Customer Dispute. Customer disputes of utility charges shall be handled in the manner provided for in SLMC 13.18.240. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.130 Discharges prohibited.

A. No person shall discharge, or cause to be discharged, any storm water, surface water, groundwater, roof runoff, subsurface drainage, cooling water or unpolluted industrial process water to any sanitary sewer.

B. Except as hereinafter provided, no person shall discharge or cause to be discharged any of the following described waters or wastes to any public sewer:

1. Any water or waste which may contain more than 100 parts per million, by weight, of fat, oil or grease;

2. Any gasoline, benzene, naphtha, fuel oil or other flammable or explosive liquid, solid or gas;

3. Any garbage that has not been properly shredded;

4. Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch manure or any other solid or viscous substance capable of causing obstruction to the flow in sewers or other interference with the proper operation of the sewage works;

5. Any water or wastes having a pH lower than five and five-tenths or higher than eight and five-tenths or having any other corrosive property capable of causing damage or hazard to structures, equipment and personnel of the sewage works;

6. Any waters or wastes containing a toxic or poisonous substance, or hazardous regulated substances which are prohibited by federal, state or city statute, rule or ordinance from being discharged into sewer systems of the type operated by the city;

7. Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant;

8. Any noxious or malodorous gas or substance capable of creating a public nuisance.

C. Grease, oil and sand interceptors shall be provided when, in the opinion of the city, they are necessary for the proper handling of liquid wastes containing grease, in excessive amounts, or any flammable wastes, sand or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the city engineer and shall be located as to be readily and easily accessible for cleaning and inspection. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.140 Severability.

The invalidity of any part of this chapter shall not affect the validity of any other part of this chapter, which can be given its full force and effect without the invalid portion or portions. (Ord. 1210 § 1, 2015; Ord. 1112 § 1, 2010).

13.14.290 Sewer rates.

A. The Soap Lake city council shall, annually or more often if necessary, by resolution, establish a schedule "Appendix S" of charges and rates for sewer hookup and connection charges, sewer rates, allotments and overage charges. The resolution shall also list all other sewer service fees and charges.

B. Definitions Applicable to Monthly Service Rates.

1. "Residential dwelling unit" means each structure, or structures, residence, or residences, located on one residential lot, and serviced by one water meter; or one or more habitable rooms occupied or intended or designed to be occupied by one family, which contains or is intended to house space for living, sleeping, preparation of food and eating, and containing toilet and bathing facilities; or each separate unit of a condominium; provided, however, that in the case of more than one structure or residence on one lot served by one meter, each residential dwelling unit shall be charged a monthly service fee.

2. "Commercial residential dwelling unit" means each apartment and each complex and mobile/manufactured home park designed to contain or containing two or more apartments, spaces or lots intended or designed to be occupied by one family, which contains or is intended to house space for living, sleeping, preparation of food and eating, and containing toilet and bathing facilities.

3. "Apartment" means three or more separate living units designed to be occupied by one family, which contains or is intended to house space for living, sleeping, preparation of food and eating, and containing toilet and bathing facilities, on a rental basis whose rental period is 30 days or greater per term. An apartment shall not include any building or cluster of buildings in which the person occupying any portion of the structure or lot has an ownership interest in any portion of the structure or lot on which the structure or structures are located. The three or more living units may be contained in one building or group of buildings located on one platted or unplatted lot if all of the units and lot are owned by the person who is the lessor.

4. "Family" means one or more individuals living, cooking and eating together in a residential dwelling unit (as herein defined), related by blood or marriage, but not more distant than first cousins; and not including a group of more than eight persons unrelated by blood or marriage. In case of a rectory, parsonage or convent, 12 persons are considered as a family. Nothing herein is deemed to supplant any provisions of the State Building Code requiring minimum amounts of square footage per person for occupancy of a structure.

5. "Water service unit" shall mean the greater of the following: each structure, or structures, residence, or residences, lot, or portion or separate unit of a condominium used as a dwelling unit by a family, as herein defined, shall be deemed one water service unit. By way of example, a triplex shall be three water service units; a condominium with 20 separate dwelling units shall be 20 water service units.

6. "Standby fee" means the fee charged for the availability of sewer service to the property. Service may have been discontinued voluntarily by the property owner. Maintenance of the availability of utility service adjacent to this property is a cost to the water/sewer utility which is to be recovered. (Ord. 1210 § 1, 2015; Ord. 1163 § 1, 2013; Ord. 1154 § 1, 2012; Ord. 1147 § 1, 2012; Ord. 1126 § 1, 2011; Ord. 1116 § 1, 2010; Ord. 1112 § 1, 2010).

Appendix S SEWER RATES

A. Connection charge for a single sewer connection to the city's main: $250.00 together with the costs of materials and repairs to infrastructure.

B. Inspection charge to inspect repairs or installations not performed by the city public works department: $50.00 per hour measured in quarter-hour increments with a one-hour minimum.

C. Monthly Service Fee. Each calendar month during which a sewer service connection is active at any time shall result in the following charges:

1. Each residential sewer connection serving a single residential dwelling unit: $43.93 per month.

Each additional residential dwelling unit using the same sewer service: $43.93 per month.

2. Each commercial sewer connection serving one commercial service: $34.40 per month.

Each additional commercial unit using the same sewer service: $34.40 per month.

3. Each commercial residential connection serving at least one commercial residential dwelling unit shall be deemed to be one residential commercial unit: $34.40 per month.

4. Usage Charge for Each Commercial Sewer Service Unit and for Each Commercial Residential Dwelling Sewer Service Unit. In addition to the monthly base rate charge for each commercial sewer service unit and for each commercial dwelling unit, there shall be charged for sewer usage the sum of $1.56 for each 100 cubic feet of water or portion thereof supplied to the commercial water service unit account and to a commercial dwelling water service unit account commencing with the first 100 cubic feet of water.

5. Minimum monthly base rate charge for each customer shall be determined by multiplying the monthly base rate charge times the number of sewer service units and then adding the usage charge of $1.56 per 100 cubic feet of water or portion thereof

supplied to the commercial residential or commercial water service account to the base unit charges, commencing with the first 100 cubic feet of water.

6. Standby fee for availability of sewer service at a property without any active service: $7.26 per month.

Standby fee for sewer service outside city limits: $14.52 per month. (Ord. 1210 § 1, 2015).

APPENDIX B
SERP DOCUMENTATION

State Environmental Review Process

SERP Cover Sheet
SEPA Notice of Environmental Determination
SEPA Checklist
Public Involvement Process
Public Meeting Handout

State Environmental Review Process (SERP) Coversheet for SRF Applicants and Recipients

DEPARTMENT OF ECOLOGY
State of Washington

Applicant and Project Information	
Applicant Name (Agency): City of Soap Lake	
Project Title: General Sewer Plan	
Project Contact Person: Darrin Fronsman	Telephone: 509-760-3738
Address: 239 Second Avenue SE, Soap Lake WA 98851	
Email: dfronsman@smwireless.net	
Brief Project Description: The purpose of this General Sewer Plan is to evaluate the City's existing wastewater collection and transmission system and identify areas where improvements are needed or will be needed within the 6- and 20-year planning periods. A video evaluation of portions of the collection system revealed that some sewer pipes have physically deteriorated and should be replaced, and 7 projects were identified for the 20-year planning period.. No capacity deficiencies were identified with respect to projected wastewater flows within the 20-year planning period and existing pipe capacity.	

Please submit all SERP documentation listed below together with this form to Ecology's Regional Engineer or Manager and the Environmental Review Coordinator for review and approval.

Check the boxes below to indicate that the SERP Packet includes the documentation for the items listed and complies with Ecology guidance and procedures. Provide comments for additional information when needed.

1. SEPA review documentation:
   - a. ☒ SEPA checklist.
   - b. ☒ The signed SEPA determination.
   - c. ☒ Documentation that the lead agency solicited public comments (affidavit of publication or similar).
   - d. ☒ Any comments received by the lead agency.
     ☒ No comments received.
   - e. ☐ Categorical exemption. (*Categorical exemptions may be further reviewed by Ecology to ensure consistency with SERP. Provide documentation of the review and determination that the entire project as funded by federal SRF qualifies for categorical exemption.*)

   Comments:

2. Cost effectiveness analysis documentation (*required for all projects after FY 2017*):
   - a. ☒ A complete description of the alternatives that were considered.

b. ☒ Documentation that all appropriate alternatives were considered (regional approaches, reclaimed water, alternative technologies, I/I correction, etc.)

c. ☒Comparison of monetary costs/benefits of each alternative.

i. ☒ Consideration of capital, operation, maintenance, replacement costs (20 year present value).

ii. ☐ Estimate of sewer rates using different financing alternatives.

iii. ☒ Data for hardship analysis (if appropriate).

d. ☒ Comparison of non-monetary costs/benefits of each alternative, including environmental impact, energy impacts, growth impacts, and community priorities.

e. ☒ Information supports that selected alternative represents the cost effective alternative.

Comments:

3. Documentation of public participation in the selection process (required for all projects):

a. ☒ Public meeting announcement.

b. ☒ Meeting agenda listing discussion of environmental impacts.

c. ☒ Meeting agenda listing discussion of alternatives, costs, and rate impacts.

Comments:

If you need this document in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

WAC 197-11-970 Determination of nonsignificance (DNS).

DETERMINATION OF NONSIGNIFICANCE

Description of proposal City of Soap Lake General Sewer System Plan _____

_____

_____

Proponent City of Soap Lake_____

Location of proposal, including street address, if any The General Sewer System Plan covers the jurisdictional boundaries of the City of Soap Lake _____

_____

_____

Lead agency City of Soap Lake _____

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030 (2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

☐ There is no comment period for this DNS.

☐ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

☐XX This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by . . . . . .

Responsible official Darryl PIercy _____

Position/title City Planner _____ Phone.509 859 2943 _

Address City of Soap Lake PO Box 1 270, Soap Lake WA 98851_____

Date. 6/28/2016 _____ Signature s/*Darryl Piercy*_____

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: **General Sewer Plan**

2. Name of applicant: **City of Soap Lake**

3. Address and phone number of applicant and contact person:

Raymond Gravelle
239 Second Ave SE
PO Box 1270
Soap Lake, WA 98851
(509) 246-1211

4. Date checklist prepared: **May 2, 2016**

5. Agency requesting checklist: **City of Soap Lake**

6. Proposed timing or schedule (including phasing, if applicable): **The General Sewer Plan provides a schedule of capital improvements. It is assumed that three sewer projects will be completed with road improvements scheduled for the 6-year planning period, and the remaining projects will be scheduled for the 20-year planning period.**

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. **No.**

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. **None.**

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. **None.**

10. List any government approvals or permits that will be needed for your proposal, if known. **Department of Ecology – Approval of planning, design, and construction as related to the funding provided.**

Grant County – Shoreline Permit for work within 200 feet of Soap Lake.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) **This project includes multiple items, as follows:**

The City of Soap Lake General Sewer Plan is a document describing the location and type of actions and policies needed to provide collection and treatment of municipal wastewater. The following projects, as presented in Chapter 6 of the Plan, are representative of the maintenance efforts and improvements proposed in the General Sewer Plan.

***New 8-Inch Sewer from MH C-67 to MH C-62*— This improvement consists of the replacement of approximately 830 lineal feet of existing 6-inch sewer main with 8-inch**

sewer main pipe along 3rd Avenue NE.

***New 10-Inch Sewer from MH B-34 to MH B-40*— This improvement consists of the replacement of approximately 350 lineal feet of existing 10-inch sewer main with 10-inch sewer main pipe along SR 17.**

***New 8-Inch Sewer from MH C-10 to MH C-12* – This improvement consists of the replacement of approximately 400 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along East Beach Park.**

***New 8-Inch Sewer from MH A-6 to MH A-7*— This improvement consists of the replacement of approximately 270 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along Lakeshore Drive.**

***New 8-Inch Sewer from MH A-26 to MH A-38*— This improvement consists of the replacement of approximately 830 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along Main Street West.**

***New 8-Inch Sewer from MH A-2 to MH A-4*— This improvement consists of the replacement of approximately 680 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along Lakeshore Drive.**

***New 8-Inch Sewer from MH A-7 to MH A-10/ New 12-Inch Sewer from MH A-13 to Lift Station 2*—**
This improvement consists of the replacement of approximately 630 lineal feet of existing 8-inch sewer main with 8-inch sewer main pipe along the field north of Evergreen Street and the replacement of approximately 890 lineal feet of existing 12-inch sewer main with 12-inch sewer main pipe along 1st Avenue NW.

***Phase II WWTF Improvements*—**
Phase II improvements include modification of the influent sampler, construction of bioselectors, an anoxic basin, a secondary clarifier splitter box, additional sludge drying beds, installation of a floating aerator in the oxidation ditch and a floating decanter in the aerobic digester, installation of a nonpotable water system, and installation of an additional effluent pump.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. **The sewer replacement projects are located within City right-of-**

way under roadways. Figure 4-2 in the General Sewer Plan (attached) shows the location of each of the sewer replacement projects as well as the location of the WWTF. These improvements are within Section 19, Township 22N, Range 27E and Section 24, Township 22N, Range 26E.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

(circle one): Flat, (rolling), hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?
Generally, the site is less than a 5% slope.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. **According to the Natural Resource Conservation Service Soils map for the area, soils are typically fine sandy loam, silty loam, and fine sand. No prime farmland is within the project site.**

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. **The City is not aware of any indications of or history of unstable soils in the immediate vicinity.**

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. **Trenching will be required for sewer main replaced with new pipe via open-trench replacement. Soil removed for excavation will be used for backfill as appropriate or taken off site. Bank run gravel will be used where native material is not suitable as backfill. Total quantities will vary by project.**

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. **Erosion of cleared areas or of stockpiled materials may occur during periods of wet weather through construction, although these periods will be minimal due to the arid climate in central Washington. However, temporary erosion control mitigation will be contractually mandated, installed, and maintained throughout the construction process to mitigate soils erosion off-site.**

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? **It is not anticipated that any new impervious areas will be installed due to this project. Surface restoration will be in-kind, with asphalt replacing disturbed asphalt and gravel replacing gravel.**

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: **The Contractor will employ Department of Ecology's best management practices to minimize the effects of erosion.**

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. **Exhaust emissions from construction equipment will occur during construction. Dust may be emitted during excavation and backfill operations. The Contractor will be required to mitigate the presence of any dust at all times by moistening exposed soil with water. The completed project will not result in new air emissions.**

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. **No off-site sources of emissions or odor will affect the proposal.**

c. Proposed measures to reduce or control emissions or other impacts to air, if any: **The Contractor will use best management practices and follow the requirements of the Contract documents in order to prevent emissions and impacts to the air.**

3. Water

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. **Yes, Soap Lake is in the vicinity of the proposed projects.**

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. **Yes. A portion of the sewer work will be within 200 feet of Soap Lake.**

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. **None.**

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. **No.**

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. **No.**

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. **No.**

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. **Yes, surface disposal of**

wastewater via rapid infiltration basins is the means through which the treated wastewater is returned to waters of the State at the facility. The facility is permitted for a maximum daily discharge of 420,000 gallons per day. This will not change as a result of the project.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. **Surface disposal of wastewater via rapid infiltration basins is the means through which the treated wastewater is returned to waters of the State at the facility. The facility is permitted for a maximum daily discharge of 420,000 gallons per day. This will not change as a result of the project.**

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. **Stormwater runoff will occur from gravel and paved surfaces and building roofs. Stormwater is anticipated to infiltrate on-site.**

2) Could waste materials enter ground or surface waters? If so, generally describe. **No.**

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. **No.**

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: **None necessary.**

4. **Plants**

a. Check the types of vegetation found on the site:

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
__x_shrubs
__x_grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?
It is not anticipated that vegetation will be removed or altered

c. List threatened and endangered species known to be on or near the site.

According to the U.S. Fish and Wildlife Service Endangered and Threatened Species list for Grant County and the Washington Department of Fish and Wildlife Priority and Habitat Species maps, Showy stickseed (Hackelia venusta) and Ute ladies'—tresses (Spirarzthes diluvialis) are potentially located in Soap Lake.

Per the U.S. Fish & Wildlife Service Recovery Plan for Showy stickseed, the only known population of Showy stickseed is in the lower slopes of Tumwater Canyon in Chelan County, and therefore is not expected to be present near the project site.

Ute ladies'—tresses have a very limited population in Washington state. They have been discovered in Grant County but require very specific conditions to grow in. The species is endemic to moist soils in mesic or wet meadows near springs, lakes, or perennial streams, and the WWTF site does not experience the elevated groundwater table typical of growth. Furthermore, the project site already consists of predominantly impervious surfaces, and disturbance of native species is not anticipated. Finally, the elevation range of known Ute ladies'"—tresses occurrences is typically 4,300 to 7,000 feet. As such, it is assumed that Ute ladies'-tresses are not present in the project area.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: **None.**

e. List all noxious weeds and invasive species known to be on or near the site. **None known.**

The projects are mostly located in City right-of-way and will not impact plant life.

5. **Animals**

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site. [help]
According to the U.S. Fish and Wildlife Service Endangered and Threatened Species list for Grant County and the Washington Department of Fish and Wildlife Priority and Habitat Species maps, the following endangered or threatened species are potentially located in Soap Lake:

- **Pygmy rabbits (Brachylagus idahoensis) (likely not present)**
- **Gray wolf (Cam's lupus) (not at site)**
- **Northern spotted owl (Strix occidentalis caurina) (not at site)**
- **Marbled murrelet (Brachyramphus marmoratus) (not at site)**
- **Bull trout (Salvelinus confluentus) (not at site)**
- **Grizzly bear (Ursus arctos horribilis) (not at site)**

It is unlikely that pygmy rabbits are present. The project site is not included in the recovery area for pygmy rabbits, as pygmy rabbits rely heavily upon sagebrush and tall grasses for cover and do not remain in the open.

The gray wolf is found in remote parts of Western Washington with a specific designation of being west of Highway 97 and 17. The gray wolf requires large tracts of wilderness and would not be located within the residential population of Soap Lake. It is assumed that gray wolves are not present in the project area.

The northern spotted owl inhabits old growth forests and landscapes. The project site does not include old growth forests, therefore it is assumed that the northern spotted owls are not present in the project area.

Marbled murrelets use forests that primarily include typical old growth forests and mature forests with an old growth component. Due to the lack of large forested areas in the vicinity of Soap Lake, it is assumed that marbled murrelets are not present in the project area.

The project site will have no impact on surface water, therefore there will be no impact to bull trout.

Grizzly bears require large, uninterrupted tracts of land and have a propensity to avoid human contact. There are only an estimated 20 grizzly bears in Washington State and their range is limited to extreme northeastern and northwestern comers of the state. For this reason, it is assumed that grizzly bears are not present in the project area.

c. Is the site part of a migration route? If so, explain. **No.**

d. Proposed measures to preserve or enhance wildlife, if any: **None.**

e. List any invasive animal species known to be on or near the site. **None are known.**

6. **Energy and Natural Resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. **The gravity sewers will not require energy. The lift stations and the wastewater treatment facility (WWTF) operate on electricity. The WWTF also has a backup diesel generator.**

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. **No.**

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: **The collection system and WWTF use gravity flow to the greatest extent possible to limit pumping requirements.**

7. **Environmental Health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. **The collection system and WWTF transport and treat raw wastewater.**

1) Describe any known or possible contamination at the site from present or past uses. **None known.**

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. **None known.**

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. **The only hazardous materials associated with the proposed project would be fuels, lubricants, and coolants used in construction equipment.**

4) Describe special emergency services that might be required. **None.**

5) Proposed measures to reduce or control environmental health hazards, if any: **Replacement of the collection system and upgrades to the WWTF will decrease exfiltration of sewage and provide improved treatment of the wastewater.**

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? **Noise generated by the operation of a municipal wastewater facility and pumps.**

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site. **Short term noise from construction equipment during the allowable working hours are expected during the course of construction.**

3) Proposed measures to reduce or control noise impacts, if any: **Construction will be limited to daytime working hours.**

8. **Land and Shoreline Use** [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. **Most of the collection system is located underneath public roadways and will not affect adjacent properties other than possible temporary detours for construction. The WWTF is at the southeast side of the City and is buffered from nearby residential areas.**

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated,

how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? **No.**

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: **No.**

c. Describe any structures on the site. **There are several buildings within the WWTF.**

d. Will any structures be demolished? If so, what? **It is not anticipated that any structures will be demolished.**

e. What is the current zoning classification of the site? **Zoning classifications are shown in Figure 2-4 of the General Sewer Plan. Collection system upgrades are located along residential and commercial zoning. The treatment plant is located in municipal zoning.**

f. What is the current comprehensive plan designation of the site? **The collection system is located underneath public roadways and alleys. The City will take into account the condition of the streets while planning collection system improvements. The WWTF is designated for this use.**

g. If applicable, what is the current shoreline master program designation of the site? **N/A.**

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. **No.**

i. Approximately how many people would reside or work in the completed project? **The WWTF requires one employee to operate and maintain the various processes and equipment.**

j. Approximately how many people would the completed project displace? **None.**

k. Proposed measures to avoid or reduce displacement impacts, if any: **N/A**

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: **N/A**

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any: **N/A**

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. **None.**

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. **None.**

c. Proposed measures to reduce or control housing impacts, if any: **N/A**

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? **The tallest structure to be built or modified will most likely be less than 10 feet above grade, with the majority of the structures primarily in-ground cast-in-place concrete.**

b. What views in the immediate vicinity would be altered or obstructed? **None.**

c. Proposed measures to reduce or control aesthetic impacts, if any: **None.**

11. **Light and Glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? **None.**

b. Could light or glare from the finished project be a safety hazard or interfere with views? **No.**

c. What existing off-site sources of light or glare may affect your proposal? **None.**

d. Proposed measures to reduce or control light and glare impacts, if any: **None.**

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

A public park and Soap Lake are in the near vicinity.

b. Would the proposed project displace any existing recreational uses? If so, describe. **No.**

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: **None.**

13. **Historic and cultural preservation** [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe. **The Department of Archaeology and Historic Preservation WISAARD does not indicate any structures within the vicinity of the project location.**

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. **None known.**

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

The Department of Archaeology and Historic Preservation WISAARD does not indicate any structures within the vicinity of the project location. Previously completed

projects in the City have not indicated that cultural and historic resources will be on or near the project site. In addition, the majority of the proposed work is in previously disturbed areas.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. **None.**

14. **Transportation** [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. **Most of the collection system is located underneath City streets. Several figures in the General Sewer Plan show these streets. The WWTF is located off of 6th Avenue SW and Maple Street.**

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? **The Grant Transit Authority travels through Soap Lake daily during weekdays and stops at the fire station. The proposal will not affect mass transit.**

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? **Parking will not be added or eliminated.**

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). **No.**

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. **No.**

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? **None.**

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. **No.**

h. Proposed measures to reduce or control transportation impacts, if any: **None.**

15. **Public Services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. **No.**

b. Proposed measures to reduce or control direct impacts on public services, if any. **None.**

16. **Utilities**

a. Underline utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. **Utilities altered by the project include the sanitary sewer collection system and the WWTF. These utilities will require construction equipment which can provide excavation and install pipeline and other appurtenances. The City of Soap Lake provides the sanitary sewer services.**

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Robt Scott

Name of signee Robert Scott, P.E.

Position and Agency/Organization Engineer, Gray & Osborne

Date Submitted: 5/5/16

D. supplemental sheet for nonproject actions [help]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?
The WWTF discharges effluent via rapid infiltration basins. The facility is permitted for a maximum daily discharge of 420,000 gallons per day. This will not change as a result of the project.

Proposed measures to avoid or reduce such increases are: **Replacement of the collection system will reduce inflow and infiltration and reduce the amount of wastewater treated at the WWTF.**

2. How would the proposal be likely to affect plants, animals, fish, or marine life?
It is unlikely that the proposal will affect plants, animals, fish, or marine life because most of the areas identified have been previously disturbed and are within City right-of-way.

Proposed measures to protect or conserve plants, animals, fish, or marine life are: **None.**

3. How would the proposal be likely to deplete energy or natural resources?
Expansions to the WWTF could require some additional energy. However, some improvements can save energy and potable water.

Proposed measures to protect or conserve energy and natural resources are: **Install a nonpotable water system and use high efficiency pumps.**

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?
The proposal is not likely to affect any of these areas.

Proposed measures to protect such resources or to avoid or reduce impacts are:
N/A.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?
The proposal is not likely to affect land and shoreline use.

Proposed measures to avoid or reduce shoreline and land use impacts are:

N/A

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

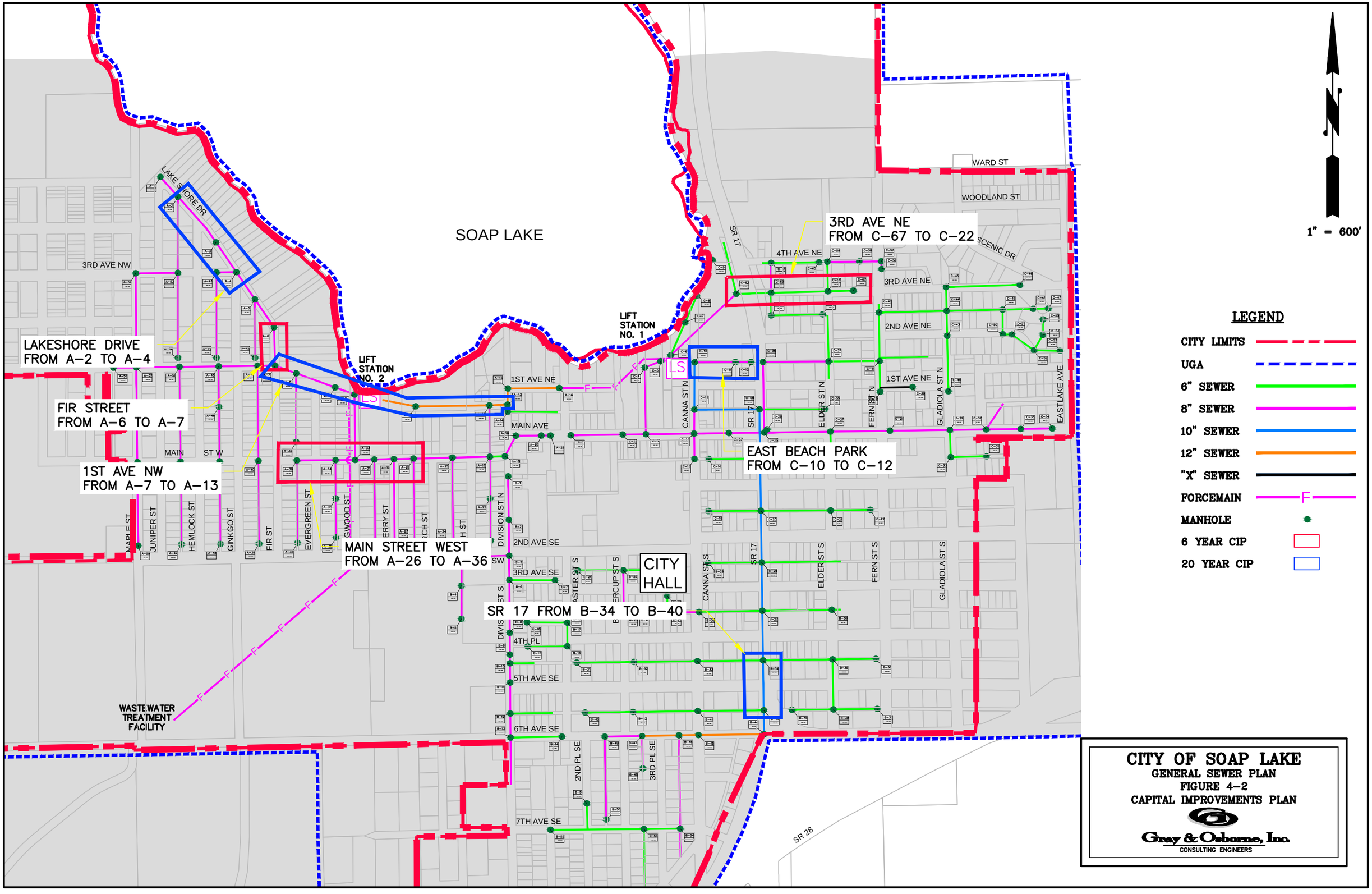
It is not likely to increase demands on transportation or public services and utilities.

Proposed measures to reduce or respond to such demand(s) are:

N/A.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

It is not anticipated that the proposal will conflict with local, state, or federal laws requiring protection of the environment.


SOAP LAKE
LAKESHORE DRIVE
FROM A–2 TO A–4
FIR STREET
FROM A–6 TO A–7
1ST AVE NW
FROM A–7 TO A–13
MAIN STREET WEST
FROM A–26 TO A–36
3RD AVE NE
FROM C–67 TO C–22
EAST BEACH PARK
FROM C–10 TO C–12
SR 17 FROM B–34 TO B–40
LIFT STATION NO. 1
LIFT STATION NO. 2
CITY HALL
WASTEWATER TREATMENT FACILITY
LAKE SHORE DR
3RD AVE NW
MAIN ST W
MAPLE ST
JUNIPER ST
HEMLOCK ST
GINKGO ST
FIR ST
EVERGREEN ST
GWOOD ST
ERRY ST
ICH ST
H ST
1ST AVE NE
MAIN AVE
DIVISION ST N
2ND AVE SE
3RD AVE SE
4TH PL
5TH AVE SE
6TH AVE SE
7TH AVE SE
2ND PL SE
3RD PL SE
DIVIS ST S
ASTER ST S
ERCUP ST S
CANNA ST N
SR 17
ELDER ST N
FERN ST N
GLADIOLA ST N
EASTLAKE AVE
WARD ST
WOODLAND ST
SCENIC DR
4TH AVE NE
3RD AVE NE
2ND AVE NE
1ST AVE NE
CANNA ST S
SR 17
ELDER ST S
FERN ST S
GLADIOLA ST S
SR 28
1" = 600'
LEGEND
CITY LIMITS
UGA
6" SEWER
8" SEWER
10" SEWER
12" SEWER
"X" SEWER
FORCEMAIN
MANHOLE
6 YEAR CIP
20 YEAR CIP
CITY OF SOAP LAKE
GENERAL SEWER PLAN
FIGURE 4-2
CAPITAL IMPROVEMENTS PLAN
Gray & Osborne, Inc.
CONSULTING ENGINEERS

City of Soap Lake Notice of Determination of Non-significance
Soap Lake General Sewer System Plan

NOTICE IS HEREBY GIVEN THAT the City of Soap Lake has determined that the adoption and implementation of the Soap Lake General Sewer System Plan is not likely to result in significant adverse environmental impacts and has issued a Determination of Non-significance.

The Soap Lake General Sewer System Plan is a considered a non-project action under SEPA rules.

A copy of the determination of non-significance for this action may be obtained upon request to the City. This information is available to the public on request and may be reviewed at City of Soap Lake, PO Box 1270, Soap Lake, WA 98851

The appeal period for this determination ends on July 12, 2016 at 5 pm.

Publish Date:

MINUTES REGULAR SOAP LAKE CITY COUNCIL MEETING

May 4, 2016

CALL TO ORDER

Mayor Pro Tem Rushton called the regular council meeting to order at 5:30 pm and led the Pledge of Allegiance.

ROLL CALL

Council members present: Glassco, Brown, Lair, Tramayne, Sanderson, Rushton and Wellein
City Staff Members Present: Deputy Clerk Richardson, City Planner Piercy, and Chief Quantz

AGENDA ITEMS

- **CONSENT AGENDA**
  Regular Council Meeting Minutes – April 20, 2016
  Claims EFTs & Claims# 16681 - 16707 in the amount of $32,154.11
  Payroll EFTs & Payroll #25037 - 25059 in the amount of $14,073.50
- **MAYOR'S MESSAGE**
- **PUBLIC HEARING –** Community Development Block Grant (CDBG) – Sewer Replacement Project
- **PUBLIC HEARING –** Community Development Block Grant (CDBG) – Parks and Recreation Capital Facility Improvement Plan Project
- **PUBLIC COMMENT**
- **OLD BUSINESS**
  A. Municipal Law Enforcement Officer – Discussion on Measurable results
- **NEW BUSINESS**
  A. Gray & Osborne – General Sewer Plan Presentation
  B. Gray & Osborne – Booster Pump Station Proposal
  C. A Resolution Authorizing Submission of the CDBG Application to the State Department of Commerce to request $24,000. To develop a Capital Improvement Plan for City Parks
  D. A Resolution Authorizing Submission of the DBG Application to the State Department of Commerce to request $750,000. To replace failing portions of City sewer lines
  E. Public Works – Discussion for extra summer help
  F. Smokiam RV Resort – Soap Lake Hydroplane Regatta – Special Event Permit Application
  G. Del Red Pub and Daisy Street Car Wash - Special Event Permit Application
  H. Soap Lake Pow Wow – Special Event Permit Application
  I. BJ's Soap Lake – Liquor License Approval
  K. Soap Lake Police Department – Sergeant Ryan Cox re-location
  L. Marijuana License Application – Seattle Growth Partners
- **REPORTS OF STANDING COMMITTEES**
  Parks Committee
- **REPORTS OF SPECIAL COMMITTEES**
  Community Clean up Committee
- **REPORTS OF CITY OFFICERS**
- **COMMENTS**
- **ADJOURNMENT**

CONSENT AGENDA

M /Lair, S /Sanderson; to approve consent agenda. **Motion carried unanimously.**

MAYOR'S MESSAGE

Mayor Pro-tem Rushton advised Mayor Gravelle is on vacation and that she would be leading the meeting.

PUBLIC HEARING

Public Hearing – Community Development Block Grant (CDBG) – Sewer Replacement Project. – Public Hearing open at 5:34. City Planner Piercy explained grant request for Sewer Replacement.

Maynard Hagen – 739 2nd Place SE – Hagen expressed his concern regarding the posting of the public hearing.

Public Hearing closed at 5:37.

Public Hearing – Community Development Block Grant (CDBG) – Parks and Recreation Capital Facility Improvement Plan Project. Public Hearing open at 5:37. City Planner Piercy explained grant request for Parks and Recreation Capital Facility Improvement Plan Project.

Maynard Hagen – 739 2nd Place SE – Hagen expressed his concern that with 25.5 million dollars to be spent he didn't feel it was proper notification to the lower/moderate class of citizens.

Public Hearing closed at 5:41.

PUBLIC COMMENT

Rhonda Lynch – 314 1st Ave SE – Lynch, a former business owner in town, voiced how discouraging it was being a business owner in town and not having support from the chamber or the council.

Galen Walley – 18 S Ginkgo – Walley thanked the Police Department. Walley also thanked the Public Works Department for graveling the alleys. Walley asked the Council to consider the smell of growing and manufacturing marijuana, and also the chance that property values may go down, before accepting application.

Judith Gorman – 207 N Ginkgo – Gorman shared Soap Lake POW WOW T-Shirts and reminded everyone to attend the POW WOW on June 3rd, 4th, and 5th. Gorman asked Council that the each consider in their cap as elected officials that healing continues in Soap Lake.

Mindy Miksch – Columbia Basin SUP – Miksch told Council there were a couple minor changes she would like to see in the Contract with the City. Mitch expressed her disgust with the condition of the beach and shoreline. Mitch is excited about promoting her business and promoting Soap Lake, but says she won't be able to if conditions do not improve. Miksch also said as a new business in town, she did not feel welcomed by the Chamber or the Council.

OLD BUSINESS

A. Municipal Law Enforcement Officer – Discussion on Measurable results – **M / Brown, S / Wellein;** to table item to May 18 Council meeting. **Motion carried unanimously.**

NEW BUSINESS

A. Gray & Osborne – General Sewer Plan Presentation – Rob with Gray & Osborne showed General Sewer Plan Slide Presentation. Discussion ensued. **M / Glassco, S / Lair;** to approve submitting General Sewer Plan to Department of Ecology for review. **Motion carried unanimously.**

B. Gray & Osborne – Booster Pump Station Proposal – **M / Tramayne, S / Lair;** to table item to May 18 Council meeting. **Motion carried unanimously.**

C. A Resolution Authorizing Submission of the CDBG Application to the State Department of Commerce to request $24,000. To develop a Capital Improvement Plan for City Parks – **M / Lair, S / Sanderson;** to approve Resolution Authorizing Submission of the CDBG Application to the State Department of Commerce to request $24,000. To develop a Capital Improvement Plan for City Parks. **Motion carried unanimously.**

D. A Resolution Authorizing Submission of the CDBG Application to the State Department of Commerce to request $750,000. To replace failing portions of City sewer lines – **M / Sanderson, S / Glassco;** to approve Resolution Authorizing Submission of the CDBG Application to the State Department of Commerce to request $750,000. To replace failing portions of City sewer lines. **Motion carried unanimously.**

E. Public Works – Discussion for extra summer help – Councilmember Tramayne discussed public works needing extra help through the summer months. Discussion ensued. **M / Tramayne, S / Sanderson;** to hire a full time seasonal maintenance worker for up to four months at $10.02 – $11.00 per hour. **Motion carried unanimously.**

F. Smokiam RV Resort – Soap Lake Hydroplane Regatta – Special Event Permit Application – **M / Lair, S / Sanderson;** to approve Soap Lake Hydroplane Regatta's Special Event Permit Application. **Motion carried. Sanderson, Lair, Tramayne, Glassco, Wellein, and Rushton For. Brown Against.**

G. Del Red Pub and Daisy Street Car Wash - Special Event Permit Application – **M / Lair, S / Wellein;** to approve Del Red Pub and Daisy Street Car Wash's Special Event Permit Application. **Motion carried unanimously.**

H. Soap Lake Pow Wow – Special Event Permit Application – **M / Sanderson, S / Lair;** to approve Soap Lake Pow Wow's Special Event Permit Application. **Motion carried unanimously.**

I. Coulee Corridor Community Kiosk – Nell Kovach shared Soap Lake's design for the Coulee Corridor Kiosk. Discussion ensued. Councilmember Glassco suggested a picture of the lake with suds replace the current picture of the lake. **M / Sanderson, S / Lair;** to approve Soap Lake's design for the Coulee Corridor Kiosk with suggestion of changing the lake picture. **Motion carried unanimously.**

J. BJ's Soap Lake – Liquor License Approval – No Objection

K. Soap Lake Police Department – Sergeant Ryan Cox re-location – Discussion ensued. **M / Glassco, S / Wellein;** to allow Soap Lake Police Department employees to live up to 25 miles from Soap Lake City Hall. **Motion carried unanimously.**

L. Marijuana License Application – Seattle Growth Partners – Discussion ensued. **M / Brown, S / Glassco;** to object to the Marijuana License Application by Seattle Growth Partners. Discussion ensued. **Brown rescinds Motion, Glassco rescinds Second.** No Objection.

REPORTS OF STANDING COMMITTEES

Park Committee – Cindy Ray thanked the Council for approving the CDBG Funding Request. Ray talked about Elder Park. Two property owners have agreed to grant easements for the lake trail. We have received 20 letters of support. Interesting obstacles were found during the Walking Audit. The playground committee is working with the 5th grade class on ideas.

REPORTS OF SPECIAL COMMITTEES

Community Clean up Committee – Judith Tramayne reported we sent out the clean- up letter and posters with the help of Rhonda Lynch and Diana Downing. Consolidated Disposal Service will pick up used appliances if citizens call the City and ask for pick up. Already have two citizens requesting help with yard clean up.

REPORTS OF CITY OFFICERS

City Planner Piercy encouraged everyone to see the Masquers Play "Our Town".

COMMENTS

Chamber representative Sanderson reported they have found a volunteer to do the Smokiam Parade. Sanderson also informed Council and public that the Clock on top of her house is going to be removed as she is getting a new roof. Sanderson asked for suggestions on where the clock could be placed.

Councilmember Wellein invited everyone to National Nursing Home Week starting Monday, May 9, 2016 at 10:00am at McKay Healthcare.

Councilmember Glassco asked to have Emergency Preparedness Plan put on the May 18th Agenda.

ADJOURNMENT

There being no further business of the Council; **M /Sanderson, S /Lair;** to adjourn at 7:40 pm**. Motion carried unanimously.**

JoAnn Rushton, Mayor Pro Tem

Anita Richardson, Deputy Clerk

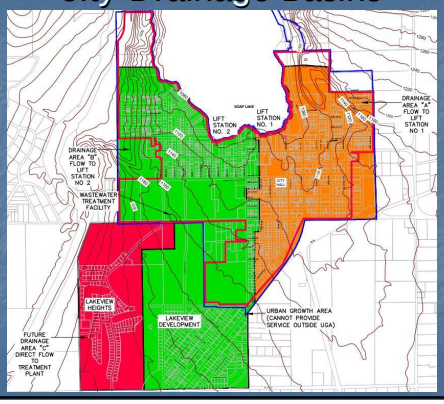
General Sewer Plan
Council Presentation

May 4, 2016

Purpose

- Evaluate City's wastewater collection and treatment facilities
- Identify deficiencies/improvements
- Create capital improvement plan
- Meet regulatory requirements to become eligible for funding programs

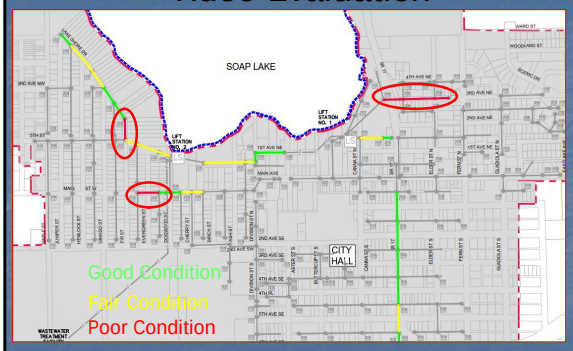
City Drainage Basins



Collection System Evaluation

- City does not have significant I/I
- Pipes have sufficient capacity for 20-year planning period
- Video Inspection – July 2015
  - 13 percent of system
    - Problem areas noted by City staff
    - Located under future roadway improvements
  - 40% Fair Condition, 20% Poor Condition
    - Fair – Some issues, but no immediate replacement need
    - Poor – Significant issues, and requires 6-yr replacement
- Conservative Assumption - Video inspection is representative of system

Video Evaluation



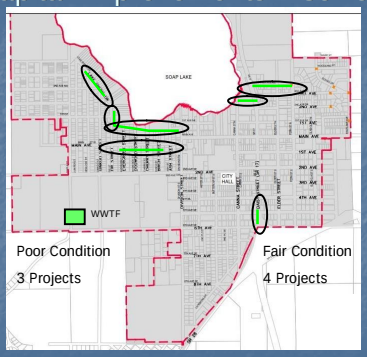
WWTF Phase II

- Identified in 2013 Engineering Report
- Critical improvements are growth-related
  - Projected Growth Rate: 1.5%
  - Historical Growth Rate: -1.3% (since 2000)
- Cost Increase
  - Upgrade Estimated Cost: $1.5M ($100,000 since 2013)
  - ENR Construction Cost Index

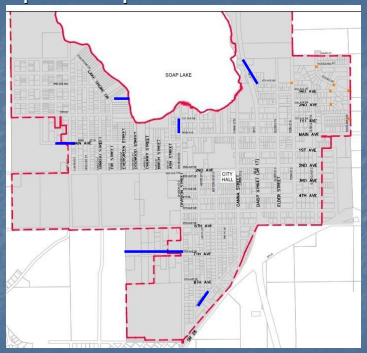
Capital Improvements

- 6-Year Improvements
  - 4 Sewer Projects: $862,000
- 20-Year Improvements
  - 3 Sewer Projects: $747,000
  - Additional Video Evaluation: $200,000
  - Sewer Jet Truck: $100,000
  - Additional Sewer Main Replacement: $4.2M
  - WWTF Improvements, Phase II: $1.5M
- Total: $7.6M

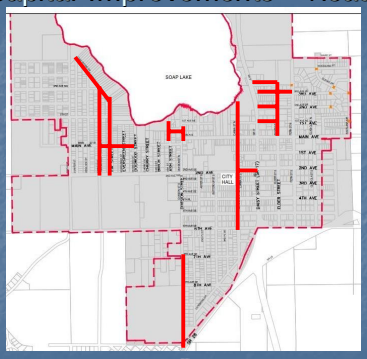
Capital Improvements – Sewers



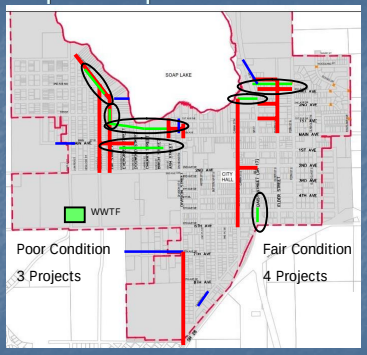
Capital Improvements – Water



Capital Improvements – Roads



Capital Improvements – All

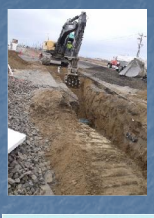


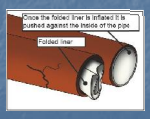
Environmental Impacts

- SEPA will be processed
- NEPA/Cross Cutter Report during design
  - Potential for Ecology to reduce requirements
- Short Term Impacts
  - Dust, noise, traffic control, etc.
- Long Term Impact
  - No detrimental effects identified

Sewer Project Alternatives

- Do Nothing
- Open Trench Replacement
- Cured-In-Place
- Fold And Form
- Pipe Bursting





Financing

- Assuming 6-yr projects completed in 2019
  - SRF Funding: 20-year, 2% interest
  - New debt service: $56,000/yr
- Eligibility and grant availability tied to City sewer rates, MHI, and LMI
- Programs: RD, SRF, CDBG, PWTF

Next Steps

- Council approves Report submittal
- Issue SEPA
- Ecology review
- Report revisions
- Submitted and approved by Ecology
- Council adopts
- Apply for funding

City of Soap Lake

Mayor: Raymond Gravelle
Public Works Supervisor: Darrin Fronsman
Finance Director: Karen Hand
Engineer: Gray & Osborne, Inc., Yakima

Project Description

The purpose of this General Sewer Plan is to evaluate the City's existing wastewater collection and transmission system and identify areas where improvements are needed or will be needed within the 6- and 20-year planning periods. A video evaluation of portions of the collection system revealed that some sewer pipes have physically deteriorated and should be replaced. Only 13-percent of the City's sewer pipe received video evaluation, with preference given to sewer pipe under roadways planned to be improved as part of the City's Transportation Improvement Program. For purposes of this Plan, it is assumed that the video evaluation is representative of the collection system. No capacity deficiencies were identified with respect to the projected wastewater flows within the 20-year planning period and existing pipe capacity.

A complete evaluation of the City's wastewater treatment facility was performed in the 2013 Engineering Report, and that evaluation was summarized in this Plan. The Engineering Report recommended a two-phase treatment facility upgrade. The first phase was completed in 2015, and the need for the second phase is primarily tied to growth in the City; while it is necessary for the City to complete the upgrade, the timing of that upgrade may be delayed until the City experiences more growth.

The Plan proposes four sewer projects be completed in the next six years, and each is to be completed with a corresponding road project in the vicinity. Three additional sewer projects are proposed for the 20-year planning period based upon the video investigation, and the Plan recommends that the City undertake additional video investigation to further evaluate the remainder of the collection system on an ongoing basis and identify additional sewer replacement projects.

The cost to complete all of the projects identified in the 20-Year Capital Improvement Plan is $7,643,000, including construction, contingency, sales tax, design, and construction administration.

Environmental Impacts

A SEPA is being processed and a NEPA or Cross Cutter Report may be completed during the design phase. This will include an Endangered Species Act (ESA) Consultation and a Cultural Resource Review (Section 106, EO 05/05).

At this time it is believed that there will be no long term environmental impacts due to this project. There will be some temporary disruption due to noise, dust and traffic control etc.; however the Contractor will be required provide adequate BMPs during construction. The City's goal is to replace or rehabilitate its collection system with trenchless technologies where possible thereby reducing the ground and environmental disturbance.

Alternatives/Cost Effectiveness

Proposed Capital Improvements project for the 20-year planning phase:

- MH C-67 to MH C-62 along 3rd Ave NE
- MH A-6 to MH A-7 along Fir Street
- MH A-26 to MH A-36 along Main Street West
- MH B-34 to MH B-40 along SR 17
- MH C-10 to MH C-12 along East Beach Park
- MH A-2 to MH A-4 along Lakeshore Drive
- MH A-7 to MH A-10/MH A-13 to Lift Station 2 along 1st Ave. NW

Alternatives Considered:

1. Do Nothing
2. Open Trench Replacement
3. Cured-In-Place (CIP)
4. Pipe Bursting
5. Fold and Form

Rate Impacts – Total Cost $862,000 (6-Year)
Total Cost $7,643,000 (20-Year)

The proposed capital improvements of $862,000 at a 2-percent interest rate for 20 years results in a yearly payment of approximately $56,000 (rounded). This results in a monthly residential debt service payment of approximately $9.50.

If the City is determined to be 'hardship' by Ecology standards, the City may qualify for $431,000 in grant and a $431,000 loan at 1.3% for 20-years resulting in a rate impact of approximately $4.40. It is unknown at this time if grant funds will be available through the current Ecology program.

APPENDIX C
WWTF FLOWS AND LOADING

TABLE C-1

2011-2015 WWTF Flow and Loading Data

Date	Average Month Flow (MGD)	Maximum Month Flow (MGD)	Average Month BOD5 (lb/day)	Maximum Month BOD5 (lb/day)	Average Month TSS (lb/day)	Maximum Month TSS (lb/day)	Average Effluent BOD5 (mg/L)	Average Effluent TSS (mg/L)
Jan-11	0.097	0.099	120.66	170.63	50.95	61.46		
Feb-11	0.092	0.100	130.01	138.52	100.86	102.01		
Mar-11	0.095	0.109	123.95	129.10	111.67	114.05	3.13	2.00
Apr-11	0.108	0.159	135.96	190.34	159.37	171.08	3.56	4.00
May-11	0.161	0.194	244.29	276.51	187.92	222.81	5.00	4.00
Jun-11	0.182	0.235	273.88	312.57	238.98	276.15	8.72	10.00
Jul-11	0.154	0.212	244.58	286.95	190.66	213.13	2.90	5.00
Aug-11	0.137	0.157	163.90	187.32	221.58	229.58	2.60	7.50
Sep-11	0.147	0.187	189.47	193.64	194.25	202.21	3.50	5.00
Oct-11	0.133	0.191	178.91	223.98	187.39	223.98	3.20	7.00
Nov-11	0.141	0.141	182.32	182.32	63.48	63.48	5.10	5.50
Dec-11	0.134	0.134	225.22	225.22	166.46	166.46	3.60	7.00
Jan-12	0.127	0.145	148.76	159.46	43.94	56.12	3.35	1.00
Feb-12	0.158	0.200	226.57	253.97	181.78	181.78	2.15	10.50
Mar-12	0.177	0.195	401.89	491.24	216.18	243.48	4.70	7.04
Apr-12	0.196	0.222	280.49	348.71	406.06	542.51	2.85	4.58
May-12	0.187	0.194	416.80	486.73	169.93	246.33	2.90	4.44
Jun-12								
Jul-12	0.205	0.229	373.09	394.97	166.64	230.73	4.50	8.18
Aug-12	0.198	0.205	207.58	211.46	255.86	300.43	4.30	7.16
Sep-12	0.196	0.202	291.02	326.65	254.91	305.57	6.10	10.09
Oct-12	0.201	0.203	492.16	517.80	180.98	254.71	5.20	10.34
Nov-12	0.200	0.204	279.29	293.80	269.29	275.12	2.90	4.87
Dec-12	0.179	0.208	242.58	249.82	237.28	247.73	4.60	7.01
Jan-13	0.170	0.178	238.25	247.88	223.93	235.27	2.30	3.00
Feb-13	0.173	0.195	291.49	339.23	255.29	274.04	5.90	4.00
Mar-13	0.171	0.185	290.26	292.97	260.89	286.55	3.80	13.00
Apr-13	0.177	0.190	266.50	303.98	244.96	246.43	9.10	6.00
May-13	0.179	0.185	383.23	461.13	223.10	226.83	6.10	9.00
Jun-13	0.182	0.196	260.22	272.51	360.37	497.69	4.60	14.00
Jul-13	0.182	0.200	241.56	254.00	186.63	239.74	4.90	9.00
Aug-13	0.184	0.199	327.97	412.49	229.33	233.17	8.60	6.00
Sep-13	0.186	0.200	260.98	296.96	186.08	257.41	2.40	3.00
Oct-13	0.189	0.208	257.31	263.77	274.17	286.78	4.90	4.00
Nov-13	0.187	0.200	260.98	286.70	277.51	339.87	5.30	9.00

Date	Average Month Flow (MGD)	Maximum Month Flow (MGD)	Average Month BOD5 (lb/day)	Maximum Month BOD5 (lb/day)	Average Month TSS (lb/day)	Maximum Month TSS (lb/day)	Average Effluent BOD5 (mg/L)	Average Effluent TSS (mg/L)
Dec-13	0.184	0.200	262.93	322.60	152.63	184.08	6.80	9.00
Jan-14	0.187	0.199	241.02	250.07	243.99	258.80	6.60	4.50
Feb-14	0.187	0.200	262.23	263.32	247.10	257.24	5.10	5.00
Mar-14	0.182	0.196	423.03	527.12	284.50	339.88	4.30	6.50
Apr-14								
May-14	0.170	0.179	331.08	363.54	135.07	262.20	2.40	2.00
Jun-14	0.193	0.215	518.59	552.71	268.87	387.78	2.70	1.90
Jul-14	0.202	0.215	381.61	429.44	211.35	330.08	3.60	4.50
Aug-14	0.204	0.221	316.85	362.26	217.19	329.95	4.80	9.10
Sep-14	0.160	0.211	240.77	249.18	156.87	316.14	2.90	2.90
Oct-14	0.163	0.179	227.49	238.49	167.56	331.58	4.10	2.80
Nov-14	0.159	0.169	299.05	304.62	133.09	204.14	4.10	3.40
Dec-14	0.113	0.163	196.52	198.78	114.93	159.21	4.30	1.60
Jan-15	0.097	0.119	165.13	173.22	114.43	215.92	7.00	5.00
Feb-15	0.101	0.125	156.37	165.21	91.95	142.30	4.70	5.00
Mar-15	0.106	0.122	201.22	231.85	100.35	158.44	5.00	8.00
Apr-15	0.105	0.128	186.98	197.40	113.54	208.34	7.40	9.00
May-15	0.111	0.132	226.35	251.53	140.57	178.60	5.00	6.00
Jun-15	0.116	0.164	214.11	263.44	177.36	362.66	4.50	6.00
Jul-15	0.112	0.133	182.17	199.91	152.11	269.85	3.70	5.00
Aug-15	0.113	0.125	180.88	187.00	143.57	180.88	4.20	9.00
Sep-15	0.104	0.128	169.85	175.14	125.55	172.54	5.90	9.00
Oct-15	0.102	0.113	168.97	189.04	109.27	207.49	4.60	11.00
Nov-15	0.100	0.130	166.41	172.33	142.90	220.10	6.70	6.00
Dec-15	0.106	0.132	169.14	184.34	110.82	139.63	3.50	5.00
5-Year Average	0.155	0.175	250.71	278.20	186.80	239.18	4.58	6.24
5-Year Max	0.205	0.235	518.59	552.71	406.06	542.51	9.10	14.00

APPENDIX D

COLLECTION SYSTEM COST ESTIMATES

City of Soap Lake
Basin A Sanitary Sewer Improvements
(November 2015 ENR National Construction Cost Index #10092)

No.	Item	Unit	6-Year MH C-67 to MH C-62 Qnty.	Unit Price	Amount	20-Year MH B-34 to MH B-40 Qnty.	Unit Price	Amount	20-Year MH C-10 to MH C-12 Qnty.	Unit Price	Amount
1	Mobilization and Demobilization	LS	1	$18,000	$18,000	1	$10,000	$10,000	1	$10,000	$10,000
2	Traffic Control	LS	1	$15,000	$15,000	1	$8,000	$8,000	1	$9,000	$9,000
3	Temporary Erosion Control	LS	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000
4	SPCC Plan	LS	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000
5	Trench Excavation Safety Systems	LS	1	$2,000	$2,000	1	$1,000	$1,000	1	$1,000	$1,000
6	Temporary Sewage Bypass	LS	1	$2,000	$2,000	1	$1,000	$1,000	1	$1,000	$1,000
7	Foundation Material	CY	10	$30	$300	10	$30	$300	10	$30	$300
8	Bank Run Gravel for Trench Backfill	CY	100	$25	$2,500	50	$25	$1,250	50	$25	$1,250
9	8" PVC Sewer Pipe	LF	830	$60	$49,800	0	$60	$0	400	$60	$24,000
	10" PVC Sewer Pipe	LF	0	$65	$0	350	$65	$22,750	0	$65	$0
	12" PVC Sewer Pipe	LF	0	$70	$0	0	$70	$0	0	$70	$0
10	48" Manhole	EA	4	$3,500	$14,000	4	$3,500	$14,000	4	$3,500	$14,000
11	Surface Restoration	SY	800	$60	$48,000	400	$60	$24,000	400	$60	$24,000

	MH C-67 to MH C-62	MH B-34 to MH B-40	MH C-10 to MH C-12
Subtotal	$153,600	$84,300	$86,550
25% Contingency	$38,400	$21,075	$21,638
8% Washington State Sales Tax	$15,360	$8,430	$8,655
Subtotal	$207,360	$113,805	$116,843
25% Admin., Fiscal, and Engineering	$51,840	$28,451	$29,211
Total Estimated Cost	$259,200	$142,256	$146,053
Rounded	**$260,000**	**$143,000**	**$147,000**

City of Soap Lake
Basin B Sanitary Sewer Improvements
(November 2015 ENR National Construction Cost Index #10092)

No.	Item	Unit	6-Year MH A-6 to MH A-7 Qnty.	Unit Price	Amount	6-Year MH A-26 to MH A-38 Qnty.	Unit Price	Amount	20-Year MH A-2 to MH A-4 Qnty.	Unit Price	Amount	20-Year MH A-7 to MH A-13 Qnty.	Unit Price	Amount
1	Mobilization and Demobilization	LS	1	$8,000	$8,000	1	$18,000	$18,000	1	$15,000	$15,000	1	$31,000	$31,000
2	Traffic Control	LS	1	$7,000	$7,000	1	$15,000	$15,000	1	$13,000	$13,000	1	$26,000	$26,000
3	Temporary Erosion Control	LS	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000
4	SPCC Plan	LS	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000	1	$1,000	$1,000
5	Trench Excavation Safety Systems	LS	1	$1,000	$1,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$4,000	$4,000
6	Temporary Sewage Bypass	LS	1	$1,000	$1,000	1	$2,000	$2,000	1	$2,000	$2,000	1	$4,000	$4,000
7	Foundation Material	CY	10	$30	$300	10	$30	$300	10	$30	$300	20	$30	$600
8	Bank Run Gravel for Trench Backfill	CY	40	$25	$1,000	100	$25	$2,500	90	$25	$2,250	190	$25	$4,750
9	8" PVC Sewer Pipe	LF	270	$60	$16,200	830	$60	$49,800	680	$60	$40,800	630	$60	$37,800
	10" PVC Sewer Pipe	LF	0	$65	$0	0	$65	$0	0	$65	$0	0	$65	$0
	12" PVC Sewer Pipe	LF	0	$70	$0	0	$70	$0	0	$70	$0	890	$70	$62,300
10	48" Manhole	EA	4	$3,500	$14,000	4	$3,500	$14,000	4	$3,500	$14,000	4	$3,500	$14,000
11	Surface Restoration	SY	300	$60	$18,000	800	$60	$48,000	700	$60	$42,000	1,400	$60	$84,000

	MH A-6 to MH A-7	MH A-26 to MH A-38	MH A-2 to MH A-4	MH A-7 to MH A-13
Subtotal	$68,500	$153,600	$133,350	$270,450
25% Contingency	$17,125	$38,400	$33,338	$67,613
8% Washington State Sales Tax	$6,850	$15,360	$13,335	$27,045
Subtotal	$92,475	$207,360	$180,023	$365,108
25% Admin., Fiscal, and Engineering	$23,119	$51,840	$45,006	$91,277
Total Estimated Cost	$115,594	$259,200	$225,028	$456,384
Rounded	**$116,000**	**$260,000**	**$226,000**	**$457,000**

Other Improvements

Video Evaluation of Remainder of System	53600	LF	x	$3.70	/LF=	$200,000 (rounded)
Additional Sewer Main Replacment	12000	LF	x	$350	/LF=	$4,200,000

APPENDIX E

DRAFT EZ-1 FORM

WASHINGTON DEPARTMENT OF ECOLOGY E.O. 05-05 OR SECTION 106 NHPA PROJECT REVIEW

HISTORIC & CULTURAL RESOURCES REVIEW

GENERAL PROJECT INFORMATION	
GRANT OR LOAN RECIPIENT: City of Soap Lake	
SITE NAME(S): City of Soap Lake (Various)	
GRANT OR LOAN NAME: To Be Determined	
GRANT OR LOAN NUMBER: To Be Determined	**GRANT OR LOAN TYPE (e.g., Centennial, 319):** To Be Determined
GRANT OR LOAN RECIPIENT CONTACT INFORMATION	
RECIPIENT CONTACT PERSON (if different than above):: Darrin Fronsman	
ADDRESS: 239 Second Avenue SE	
CITY, STATE: Soap Lake, WA	**PHONE #:** (509) 760-3738
ZIP, COUNTY: 98851, Grant	**EMAIL:** dfronsman@smwireless.net
FUNDING AGENCY INFORMATION (*to be completed by the Ecology Project Manager*)	
ECY PROJECT MANAGER:	**PHONE #:** ( ) -
ECY FINANCIAL MANAGER:	**PROJECT MGR EMAIL:**
ECY PROGRAM:	
FUND(ING) (e.g., Land and Livestock Program):	
Notes:	

1

[1] If you need this document in a format for the visually impaired, call Water Quality Reception at Ecology, (360) 407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

PLEASE DESCRIBE THE TYPE OF WORK TO BE COMPLETED

(Be as detailed as possible to avoid having to provide additional information;
If more than one site, list information for all locations)

Do you have an Inadvertent Discovery Plan (IDP) in place[2]? Yes ☐ / No ☒

Provide a detailed description of the proposed project:

The project consists of the replacement of various sewer lines throughout the City. On a project specific basis, the City will consider replacement through open trench, cured-in-place rehabilitation, pipe bursting, or fold and form construction methods as best fits the project.

Describe the existing project site conditions:

The various sewer replacement projects are located within City right-of-way under roadways.

[2] Ecology requires an IDP for all funded projects. You must submit an approved IDP to Project Manager before beginning project. For an IDP template, contact your Project Manager or download one here: http://www.ecy.wa.gov/programs/wq/funding/GrantLoanMgmtDocs/Eng/GrantLoanMgmtEngRes.html

Describe the proposed ground disturbing activities, including specific information on the length, width and depth of ground disturbance. Include disturbance such as access roads:

Ground disturbing activities will differ on a project-specific basis based upon the City's ability to utilize trenchless technologies in lieu of open cutting to replace sewer lines. At a minimum, each project will include excavation of pits on either end of a project to allow for insertion of pipes and/or retrieval of equipment at the end of a sewer line. For open cut projects, a trench at least 3 feet in width will be excavated for the length of the sewer main, and appropriate repair of asphalt will be required. The total length of sewer to be replaced throughout the City is approximately 4,850 feet.

Describe the results from the DAHP WISAARD (instructions below) https://fortress.wa.gov/dahp/wisaard/:

The project sites are located throughout the City in Township 22, Range 26E, Sections 24 and 25, and in Township 22, Range 27E, Sections 19 and 30. There is one Historic Registered Property identified on the WISAARD site within these areas, the Soap Lake Senior Center.

Is your site considered "moderately" to "highly sensitive" using the DAHP WISAARD Statewide Predictive Layer? Yes ☒ No ☐ Unknown ☐

If YES, for sites with known historic resources/properties, include that location in your project boundaries (the proposed Area of Potential Effect[3]) or show it on your map. The Area of Potential Effect is the project boundary expanded to include any eligible properties that may be affected by the project activities.

Do you have knowledge of any ground disturbing work or previous cultural resource review within the project boundaries/Area of Potential Effect within the past 5 years?
Yes ☐ Unknown ☒

[3] Area of Potential Effect as defined under 36 CFR 800.16(d) of the National Historic Preservation Act and may be different from the project/site boundaries. The *Area of potential effects (APE)* means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

ATTACH A MAP OR AERIAL IMAGE SHOWING THE PROJECT LOCATION, AREA OF POTENTIAL EFFECT, AND NEARBY IDENTIFYING FEATURES (ROADS, WATER). USGS QUADS PREFERRED

Provide additional information, photos, or maps for the review in a separate document as an attachment.

Project Location:

REQUIRED: **Various Sites Within City**

Township: 22 **Range:** 26E, 27E **Section:** 24,25,19,30
Address: Various **City:** Soap Lake, WA **County:** Grant County
Lat: Various **Long:** Various

Will structures 50 years or older be altered or demolished[4]? Yes ☐ No ☒

If "Yes", visit the DAHP Historic Property Compliance Website and complete an online EZ-2 form[5].

[4] Questions on historic infrastructure? Please contact: Russell Holter (Preservation Design Reviewer), Phone: 360-890-0174 (cell), Email: Russell.Holter@dahp.wa.gov.

[5] For online EZ 2 form, go to: http://www.dahp.wa.gov/compliance-historic-buildings-2
See "Compliance Documents" > *EZ – 2 Form (Determination of Eligibility) and EZ-2 Form Tutorial.)*

Finished? Send this form to:

YOUR ECOLOGY PROJECT MANAGER

For specific questions on archaeological resources and historic properties, contact:

Department of Archaeology and Historic Preservation or Robert Whitlam, Ph.D.
State Archaeologist, DAHP
P.O. Box 48343 (360) 586-3080
Olympia, WA 98504-8343 rob.whitlam@dahp.wa.gov

This form may only initiate consultation. For some projects, Ecology, affected tribes, DAHP or other agencies may require additional information to complete review such as plans, specifications, and photographs. An historic property inventory form may need to be completed by a qualified preservation professional.

Instructions for the DAHP WISAARD (Washington Information System for Architectural and Archeological Records Data):

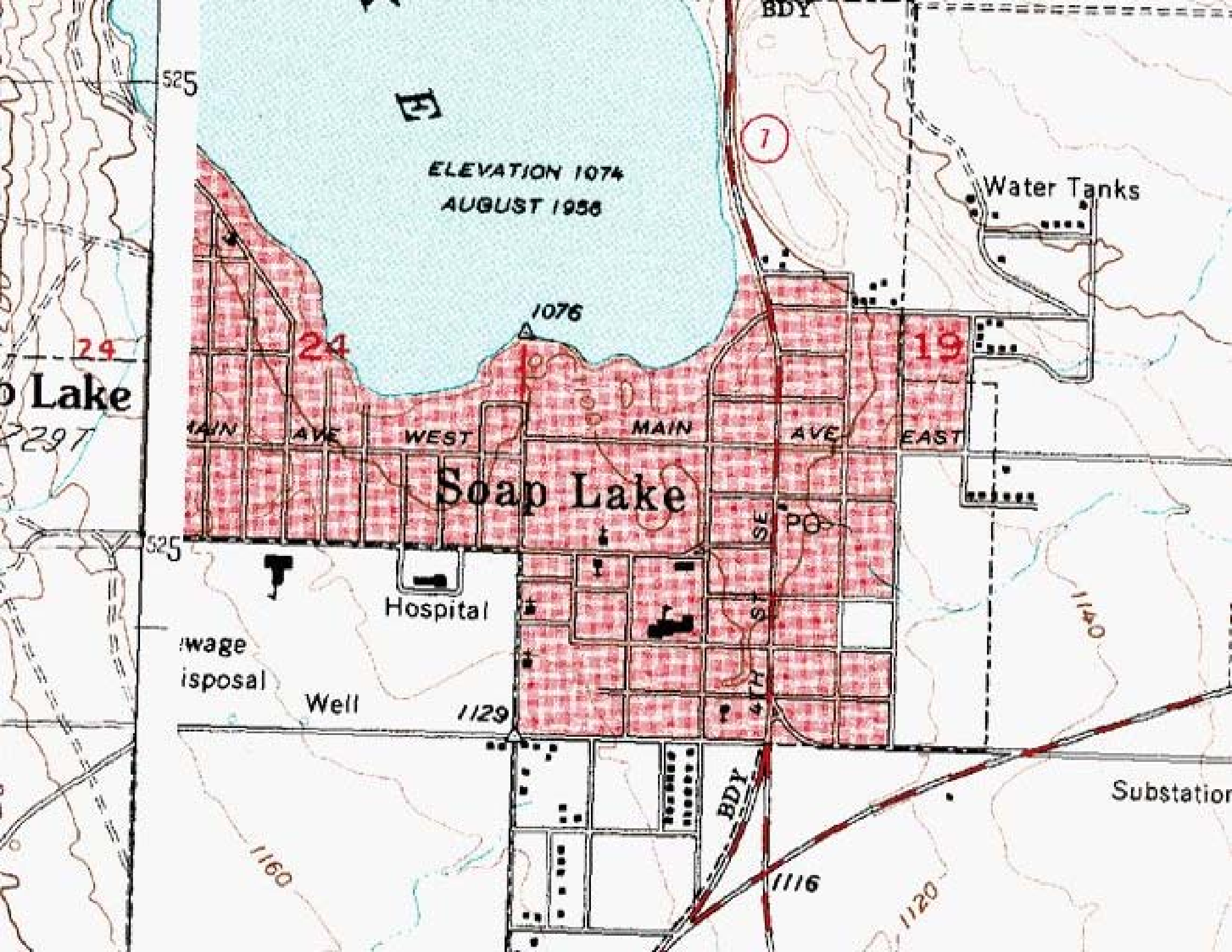
You can launch the DAHP WISAARD at:
https://fortress.wa.gov/dahp/wisaard/

This is a public planning tool to help check the sensitivity of a location. You can review your project location for cultural sensitivity or the presence of historic properties on the National Register. Doing so before you complete this form will help you design your project. It will also help inform you as to whether a survey or monitor may or may not be required.

General instructions:

1. Select "Find Location" tab/.
2. Enter the Township, Range, East/West, and Section from your EZ-1 Form.
3. Press "Go To Location."
4. Verify this is the correct location.
    i. To pan, use the pan button in the upper left corner.
    ii. Zoom in or out using the buttons or the +/-.
5. Select "Layers."
    i. Expand "Base Layers."
6. Choose the map you want – default is street map, you can select USGS Quad or Imagery (turn off street map).
7. To see how sensitive an area is, select "statewide predictive model" – the colors will show a range of risks for your area (expand the layer selection on the left to see the key). DAHP uses this model quite often.
8. Other layers that can help you:
    a. Historic Register Properties is automatically turned on. You will see any properties listed or proposed for the National Historic Register in your area.
    b. You can turn on the cadastral layer (under GLO Survey Plat Map Layer), which is the Government Land Ownership (GLO) survey map set, completed when the Federal Government was platting the states into sections, ranges and townships. There are a number of notes on these layers identifying historic features, archaeological features, and other areas which may increase the sensitivity of a location.
    c. Can't find your waterbody? Turn on the "water" layer.
    d. Can't find a road? Turn on the "Road" layer.

Questions on the DAHP WISAARD: Watch the video here, or call (360) 586-3065
http://www.dahp.wa.gov/learn-and-research/find-a-historic-place


525
ELEVATION 1074
AUGUST 1958
1076
24
19
29
Lake
297
MAIN AVE
WEST MAIN AVE
EAST
Soap Lake
525
Hospital
SE PD
SE 5TH ST
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isposal
Well
1129
BDY
Water Tanks
1140
1160
1116
1120
Substation