March 2024

PROJECT NO. 218102-006

NORTH LAKE RECREATIONAL SEWER AND WATER DISTRICT

Wastewater Facility Planning Study

PROFESSIONAL ENGINEER

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3/21/2024

STATE OF IDAHO

JASON KING

APPROVED

By: C. Gary Carroll, P.E.

State of Idaho
Department of Environmental Quality

Date: Mar 28, 2024

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EXECUTIVE SUMMARY

This wastewater facility planning study presents the findings and recommendations for the North Lake Recreational Sewer and Water District's wastewater system based on recent trends and forecasts of future flows. It also documents the current condition of the facilities and identifies deficiencies. The study also evaluates the benefits and costs of improvement alternatives and makes recommendations for financial plans to support those improvements. The goal of this facility planning study is to create a financial plan to guide financial and operational wastewater decisions.

Keller Associates has worked with key district staff to understand the challenges currently facing the system and to develop practical, cost-effective solutions. Keller Associates gratefully recognizes the Board of Directors, Operations Manager, WWTP Manager, the district administrative support staff, and all others involved for their support and assistance in the completion of this study.

ES.1 PLANNING CRITERIA

Regulatory requirements and engineering best practices formed the basis for the evaluation in this facility planning study. Applicable regulatory requirements include the District's reuse permit and state water quality standards. An in-depth discussion of planning criteria is included in Chapter 1.

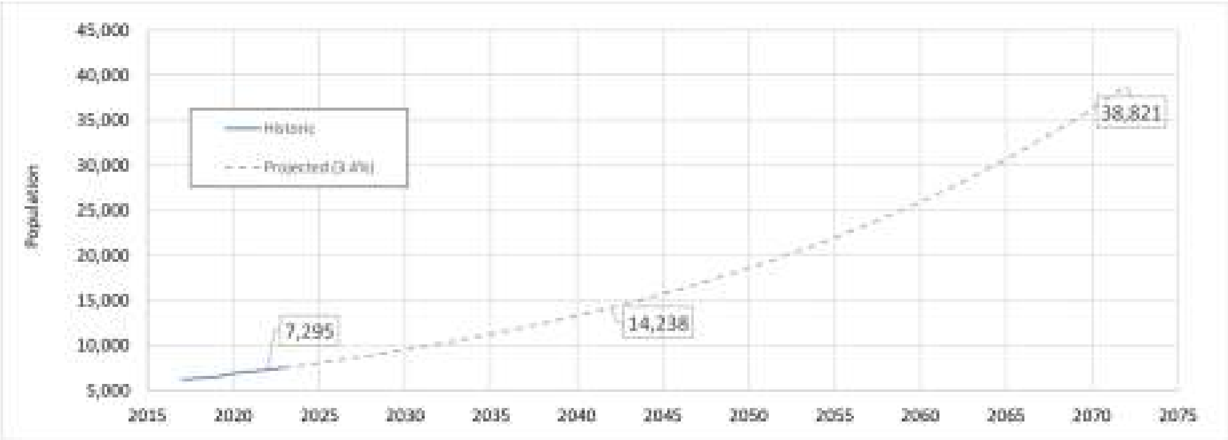
Study Area and Land Use

The study area is in the more densely populated area on the north end of Lake Cascade. It includes the City of Donnelly, Tamarack Resort, and five other recreational neighborhoods. The service area includes recreational cabins and homesites, the majority of which are used on weekends and holidays. There is also federal, county, and state-owned land scattered throughout the area; some of which include campground facilities for summer use by the public. The wastewater treatment plant is located just outside the southern border of the City of Donnelly. The effluent is used to irrigate several fields near the treatment plant.

Population

The District is experiencing fairly steady, but rapid growth. For future projected populations, the District elected to assume a growth of 3.4%, which is the average growth rate in Valley County from 2015 to 2020. This equates to adding approximately 6,950 people over the next 20 years. Figure ES-1 shows the historical and projected populations for the planning area.

FIGURE ES-1: HISTORICAL AND PROJECTED POPULATIONS



Wastewater Flows

Table ES-1 presents the flow projections for the membrane treatment plant. The method used to estimate the flows is discussed in Chapter 1. The historical loadings (pounds per day of contaminants) to the treatment plant and the 20-year projected loadings are also discussed in Chapter 1.

TABLE ES-1: PROJECTED MEMBRANE TREATMENT PLANT INFLUENT FLOWS (MGD)

Year	ADF	MMF	MDF	PHF
2022	0.237	0.390	0.497	0.746
2027	0.280	0.462	0.588	0.882
2032	0.331	0.545	0.695	1.04
2037	0.391	0.645	0.821	1.23
2042	0.462	0.762	0.971	1.46

Peak wastewater flows have historically been diverted to the lagoon system rather than sent to the membrane treatment plant. For this planning study, it was assumed that peak events would continue to be diverted. Planning criteria for the collection system, which needs to pass the peak events, was also developed and is shown in Table ES-2.

TABLE ES-2: PROJECTED COLLECTION SYSTEM INFLUENT FLOWS (MGD)

Year	MDF	PHF
2022	1.91	2.87
2042	2.92	4.38
2072	6.49	9.74

ES.2 EXISTING FACILITIES ASSESSMENT

The wastewater system consists of approximately 39 miles of gravity sewer lines, 17 miles of pressure sewer lines, 29 lift stations, a lagoon system, a membrane bioreactor system, land application, and rapid infiltration basins. A calibrated model was used to assess the effects of the existing and future maximum day flows on the existing system. The gravity lines in the system appear to have enough capacity to handle existing flows, except for the short, 8-inch influent pipe to the Big Smoky lift station, which is only slightly over targeted depth over diameter (d/D) capacity. All pump stations and force mains are adequately sized to handle existing flows as well. For committed developments (20-year capacity), the primary southern trunkline upstream of the Big Smoky lift station is undersized for flows produced by committed EDUs. While no surcharging is present in the trunkline, it is recommended that improvements be made prior to finishing development on committed EDUs. Several pump station firm capacities are exceeded and need improvements. However, all force mains are adequately sized to carry desirable velocities. For future system (buildout capacity) analysis, the same problem pipeline as displayed in 20-year analysis has its issues exacerbated, with lengths of pipeline upstream of the Big Smoky lift station at capacity or surcharging. Several more pump stations reach or exceed firm capacity. All force mains are still adequately sized to carry desirable velocities.

The treatment facilities include a lagoon system and a membrane bioreactor system. The lagoon system includes two aerated treatments and one polishing treatment lagoons, two storage lagoons, and gas chlorination. The membrane bioreactor system includes a headworks with influent screens, biological process basins, and membrane treatment. The membrane bioreactor also has UV disinfection system but it is not normally used. Effluent is land applied or sent to the rapid infiltration basins. Biosolids from the process basins are pumped to the lagoon system for treatment and storage. Solids in the lagoons are reaching capacity.

The main deficiencies in the wastewater system are as follows:

Collection System

- Lack of pump redundancy at following pump stations:
- Big Smoky
- Rex/Morning
- Day/Wagon
- Hawks Bay
- The Reserve
- Ponderosa
- FM Church Camp
- Tamarack
  - All or nearly all pump stations are lacking:
- Safety and security measures such as fencing, fall protection, and locks
- Flow meters
- Pressure gauges
- Air release valves
- SCADA connection
- Backup power is not available at 11 pump stations.
- WW Lake Crossing force main does not have adequate capacity to convey 20-year flows.

WWTP Headworks

- The WWTP lacks a dedicated grit removal system. The fine screen is the only solids removal process upstream of the MBR.
- The HVAC system needs to be improved to limit future corrosion in the headworks.

MBR Treatment

- There is a resonance issue for one of the process blowers at certain speeds.
- The process basins and blowers will be near capacity at the end of the 20-year planning period. However, additional influent loading data may indicate lower than projected loadings.
- The permeate pumps will be near their firm capacity at the end of the 20-year planning period. A spare pump could reduce the risk of a long lead time if a pump fails.
- Similarly, spare parts on other equipment would help avoid similar long lead time risks.
- Currently one RAS pump and one mixer are missing from the process basins.
- The WAS pumps are oversized, which makes it difficult to control the amount of WAS pumped. Replacement of these pumps could be part of a sludge dewatering project.
- An ORP probe and recycle pumps are recommended to monitor conditions in the process basins and assist with additional biological nutrient removal for discharge compliance at the RI basins.
- The blowers will be nearing their expected life span during the 20-year period. Rather than replacing the blowers with the same type, higher efficiency blowers are recommended.

Biosolids

- The biosolids are currently sent to Lagoon 1, which is at its solids storage capacity.
- A Biosolids Management Plan will be needed prior to disposing of the biosolids.

Lagoons

- The winter storage capacity in the lagoons is not sufficient. Without additional storage lagoons and land application area, the RI basins will need to be used for effluent disposal.
- The firm capacity for the irrigation pumps is not sufficient.
- Based on the aeration pattern there appears to be some lagoon diffusers that need to be replaced.

Disinfection

- Gas chlorine disinfection of the lagoon effluent is a safety hazard.
- If additional land application area is added and the irrigation pumps increase, the chlorine dosing and contact system may exceed its capacity.
- UV disinfection system is approximately 15 years old, has not been used, and may need to be upgraded.

SCADA

- The SCADA system is outdated and presents difficulties archiving data.
- Similarly, the plant PLCs are reaching their expected life and should be updated.

Rapid Infiltration

- The RI basins require maintenance to avoid vegetation growth. Similarly, the valves for each basin require operation and some repair.
- Phosphorus removal needs to be enhanced prior to discharging to the RI basins.

ES.3 WASTEWATER SYSTEM ALTERNATIVES

For the collection system, several alternatives were considered to address existing and future capacity issues within the system. Based on the evaluation presented in Chapter 7, the extension of the WW Lake Crossing force main was recommended to alleviate capacity concerns upstream of the Big Smoky Lift Station. Another alternative scenario that was discussed in Chapter 7 was pipeline replacements as the pipelines approach the end of their useful life.

For the treatment plant, several options were considered to meet the deficiencies listed. The major decision was whether to continue with land application of all of the effluent or to move to apply some of the effluent at the rapid infiltration basins more regularly. Based on the evaluation in Chapter 8, the recommended direction is to move toward more regular use of the rapid infiltration basins. Additional alternative evaluations were made concerning different coagulants for phosphorus removal (rare earth was preliminarily recommended) and biosolids treatment (mechanical dewatering was recommended).

ES.4 CAPITAL IMPROVEMENT PLAN

The main result of this wastewater planning study update is a 20-Year Capital Improvement Plan (CIP) to guide the District's purchasing decisions. The CIP is shown in Table ES-3 and Table ES-4 includes a recommended order to address the wastewater system deficiencies. The costs shown in the CIP are planning-level estimates (Class 5 cost opinion by the Association for the Advancement of Cost Engineering) and can vary depending on market conditions. It is recommended that Priority 1 items be implemented in the next five years. The timeline for Priority 2 and 3 improvements should be updated based on growth and budget.

TABLE ES-3: 20-YEAR COLLECTION SYSTEM CAPITAL IMPROVEMENT PLAN

Project ID#	Project Name	Primary Purpose	Total Estimated Cost (2023 Dollars) [1]
Priority 1 Improvements (Prior to 5 years)			
1.1	Pump Station SCADA Improvements	Data information collection and tracking	$1,330,000
1.2	Downstream WW Lake Crossing Gravity Line Improvement	Increase pipeline capacity	$3,872,000
1.3	WW Lake X-ing Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$160,000
1.4	Day/Wagon Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$260,000
1.5	Mtn Shadows Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$140,000
1.6	Mtn Meadows Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$180,000
1.7	Ponderosa Pump Station Upgrades	Correct existing pump redundancy deficiency	$60,000
1.8	Big Smoky Pump Station Upgrades	Correct existing pump redundancy deficiency	$80,000
1.9	Rex/Morning Pump Station Upgrades	Correct existing pump redundancy deficiency	$70,000
1.10	Hawks Bay Pump Station Upgrades	Correct existing pump redundancy deficiency	$69,000
1.11	The Reserve Pump Station Upgrades	Correct existing pump redundancy deficiency	$77,000
1.12	FM Church Camp Pump Station Upgrades	Correct existing pump redundancy deficiency	$30,000
1.13	Tamarack (Discovery, Upper) Pump Station Upgrades	Correct existing pump redundancy deficiency	$25,000
1.14	Pump Station Safety and Security Improvements	Improved system safety and security	$580,000
1.15	Little Lane Pump Station Upgrades	Improved efficiency and operation	$32,000
1.16	Grasmick Pump Station Upgrades	Improved efficiency and operation	$52,000
1.17	Smiling Julie Pump Station Upgrades	Improved efficiency and operation	$16,000
1.18	Camas Pump Station Upgrades	Prevention of backflow	$14,000
1.19	Margot Pump Station Upgrades	Prevention of backflow	$30,000
1.20	Jack's Loop Pump Station Upgrades	Improved level control	$7,000
1.21	Poison Creek Pump Station Upgrades	Improved level control and lifespan	$16,000
1.22	Steelhead Pump Station Upgrades	Improved level control and lifespan	$10,000
		Total Collections Priority 1 Improvements (rounded)	**$7,110,000**
Priority 2 Improvements (Prior to 20 years)			
2.1	Parallel Force Main to WWTP	Increase conveyance capacity to WWTP	$2,244,000
2.2	Upstream WW Lake Crossing Lift Station Gravity Line Improvement	Increase pipeline capacity	$996,000
2.3	Upstream Day/Wagon Lift Station Gravity Line Improvement	Increase pipeline capacity	$5,324,000
2.4	Pump Station Air Release Valve Improvements	Improve pipe pressures	$150,000
2.5	Pump Station Flow Monitoring Improvements	Improved efficiency, operation, and management	$1,400,000
2.6	Pump Station Gauge Improvements	Improved efficiency and operation	$180,000
2.7	Pump Station Backup Power Improvements (Transfer Switches Only)	Improved reliability and emergency coverage	$620,000
2.8	20-Yr WW Lake X-ing Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$1,750,000
2.9	20-Yr Ponderosa Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$220,000
2.10	20-Yr Big Smoky Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$1,750,000
2.11	20-Yr Rex/Morning Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.12	20-Yr Jack's Loop Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.13	20-Yr Hawks Bay Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$208,000
2.14	20-Yr Poison Creek Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$894,000
2.15	20-Yr Smiling Julie Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.16	Fir Grove Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$144,000
2.17	Day Star Lake X-ing Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$122,000

2.18	Arrowhead Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$20,000
2.19	Hillhouse Pump Station Upgrades	Replacement of worn components	$46,000
2.20	RR Village Pump Station Upgrades	Replacement of worn components	$11,800
2.21	Lake Forest Pump Station Upgrades	Improved efficiency and operation	$3,000
2.22	Meadows (West Mtn) Pump Station Upgrades	Improved efficiency and operation	$15,000
		Total Collections Priority 2 Improvements (rounded)	**$16,427,800**

Notes: The cost estimate herein is concept level information only based on our perception of current conditions at the project location and its accuracy is subject to significant variation depending upon project definition and other factors. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. This cost opinion is in 2023 dollars and does not include escalation to time of actual construction. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

TABLE ES-4: 20-YEAR TREATMENT SYSTEM CAPITAL IMPROVEMENT PLAN

Project ID #	Project Name	Primary Purpose	Total Estimated Cost (2023 Dollars)
Priority 1 Improvements			
1.1	Lagoon Sludge Removal and Diffuser Replacement	Operations	$1,280,000
1.2	Dewatering System	Operations, Capacity	$1,902,000
1.3	Headworks (Grit Removal, HVAC Upgrade)	Operations	$1,190,000
1.4	RI Basin Maintenance	Operations, Capacity	$978,000
1.5	Phosphorus Removal	Permit Compliance	$104,000
1.6	Miscellaneous Items including Spare Parts	Operations, Capacity, Redundancy	$455,000
1.7	SCADA and PLC Upgrades	Operations	$474,000
1.8	Convert Disinfection from Gas to Liquid Chlorine	Safety, Capacity	$707,000
		Total WWTP Priority 1 Improvements (rounded)	***$7,090,000***
Priority 2 Improvements			
2.1	Blower Upgrade	Power Savings, Capacity	$2,879,000
2.2	Belt Dryer	Operations	$5,058,000
2.3	Additional Membranes and Permeate Pumps	Capacity	$572,000
		Total WWTP Priority 2 Improvements (rounded)	***$5,058,000***
		TOTAL TREATMENT PLANT IMPROVEMENT COSTS (rounded)	**$12,148,000**

Notes: The cost estimate herein is concept level information only based on our perception of current conditions at the project location and its accuracy is subject to significant variation depending upon project definition and other factors. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. This cost opinion is in 2023 dollars and does not include escalation to time of actual construction. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

ES.5 IMPLEMENTATION PLAN

The District Board of Director's will determine the implementation timeline of projects and the funding options for the upgrades. See Chapter 9 and the November 2020 Rate Study in Appendix H for funding considerations and implementation.

CHAPTER 1 - PROJECT PLANNING

North Lake Recreational Sewer and Water District (NLRSWD; District) manages a wastewater collection system and treatment facility for several service areas near Donnelly, Idaho and Lake Cascade. The system includes approximately 39 miles of gravity sewer lines, 17 miles of pressure sewer lines, 29 lift stations, a lagoon system, and a Membrane Bioreactor (MBR) Wastewater Treatment Plant (WWTP).

Influent flow is directed through the headworks and screening facility before being treated in the MBR system. Following MBR treatment the final effluent is discharged to Lagoon 5 for storage until it is land applied. The wastewater is land applied in accordance with the Idaho Department of Environmental Quality (DEQ) Reuse Permit No. LA-000070-04 (Appendix A). Rapid Infiltration (RI) basins are available for effluent disposal from the MBR system if the storage lagoons get too full. When the RI basins are utilized, the effluent passes through the UV disinfection system prior to discharge. Storage lagoons are used to store the effluent until the water can be used for irrigation during the growing season (May 1st – October 15th). Effluent from the storage lagoons is applied to two management units (MUs) during the growing season.

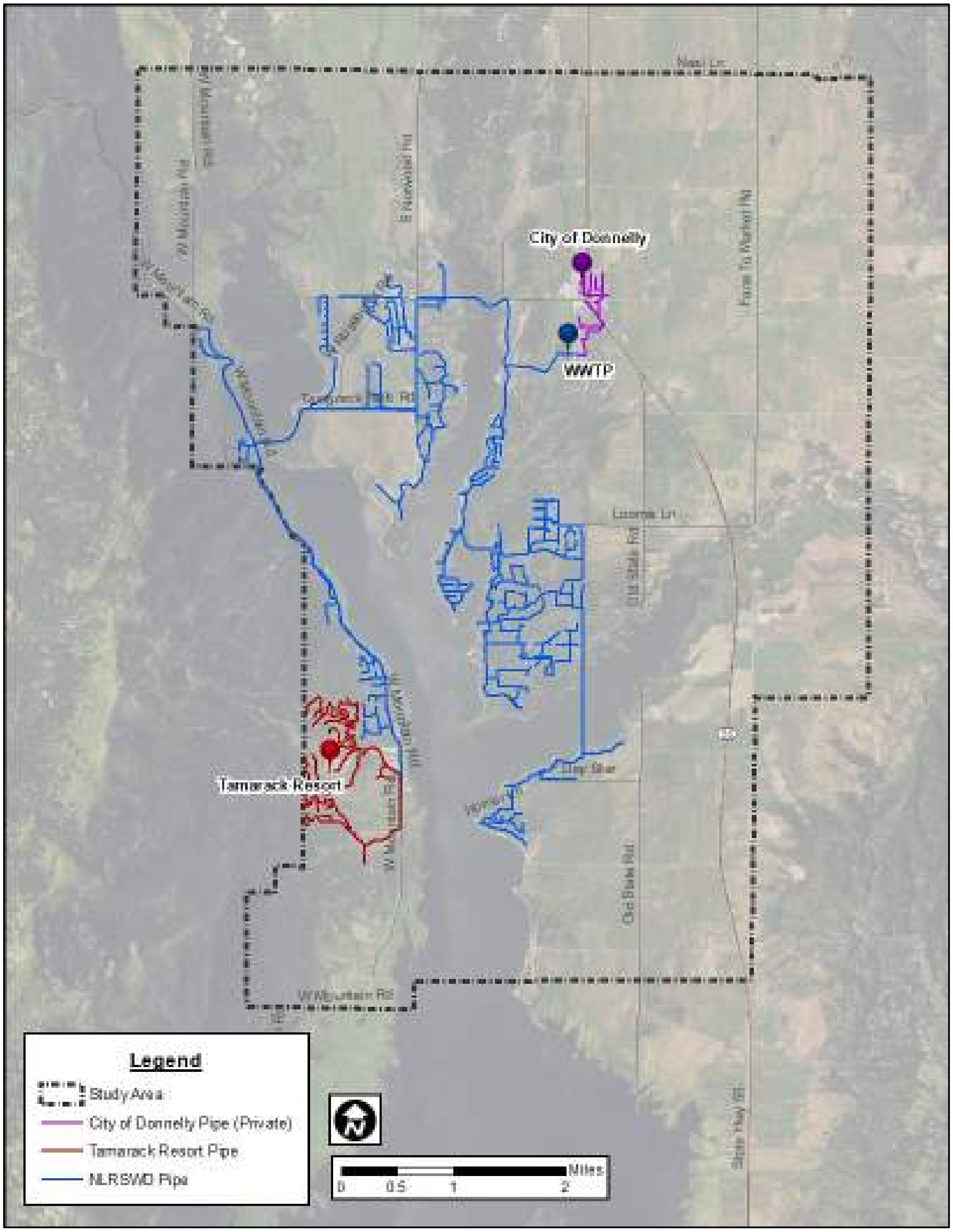
The purpose of this study is to provide an updated plan for the continued and future development, operation, and maintenance of the collection system and treatment plant. Specifically, NLRSWD wants to evaluate the limitations of the existing lift stations and force mains and establish trigger points for future improvements.

This WWTP Facility Planning Study (FPS) generally follows the DEQ and United States Department of Agriculture (USDA) - Rural Development (RD) suggested outline for planning studies. This chapter gives an overview of the project location, discusses the environmental considerations within the planning study area, and the population growth trend in the area. Additionally, planning criteria for future flows and regulatory requirements are discussed.

1.1. LOCATION

The NLRSWD was established to provide sewer service to the densely populated areas on the north end of Lake Cascade. The study area is in the west central portion of Idaho, 90 miles north of Boise. The City of Donnelly, Tamarack Resort, and five other recreational neighborhoods are within the service area. The City of Donnelly is located on the northeast end of the lake. The service area includes primarily recreational cabins and homesites, the majority of which are used on weekends and holidays. There is also federal, county, and state-owned land scattered throughout the area; some of which include campground facilities for summer use by the general public. The WWTP is located just outside the southern border of the City of Donnelly. Figure 1-1 shows Lake Cascade and the service area for this planning study.

FIGURE 1-1: SERVICE AREA MAP



NLRSWD pipelines (blue in Figure 1-1) were modeled and evaluated in this study as they are owned and operated by the District. Pipelines in the Tamarack Resort area (red in Figure 1-1) are owned by the District but were not modeled and evaluated in this study due to the significant slopes (capacity) they present in the collection system. City of Donnelly pipelines (purple in Figure 1-1) are considered private and were also not included in the model, as these collection lines are not owned or maintained by the District.

1.2. ENVIRONMENTAL CONDITIONS

This is solely a planning project, with recommended infrastructure and operational improvements that may have environmental impacts. While these impacts are briefly discussed in this report, a full environmental analysis is not included. This section along with Appendix F, presents a summary of the environmental resources in the NLRSWD. Potential consequences for improvements are discussed later in the report.

1.2.1. Physiography, Topography, Geology, and Soils

Lake Cascade and the City of Donnelly lie within the Long Valley of Valley County, Idaho at the base of the Payette National Forest. Elevations on the north end of Lake Cascade range from 4,800 to 5,000 feet, while the adjacent glaciated mountains rise above 7,000 feet. The WWTP is located on the northeast end of Lake Cascade on relatively flat topography at an elevation of 4,860 feet.

The soils through the northern Lake Cascade area have considerable variability in grain size, texture, and depth. The topsoils are generally sandy loams.

1.2.2. Surface and Ground Water Hydrology

Boulder Creek flows along the eastern edge of Donnelly and the WWTP, but the primary surface water is Lake Cascade. Lake Cascade is located on the North Fork of the Payette River. Several major tributaries, Lake Fork Creek, Gold Fork River, Boulder Creek, and Willow Creek, enter from the northeast. The North Fork of the Payette and its major tributaries flow through Long Valley, north of the reservoir. Poor drainage and high-water tables are prevalent along the west shoreline and in smaller areas where the terrain is essentially flat with poor draining soils, or at elevations below the high-water line.

Groundwater beneath the WWTP flows generally towards the southwest and is primarily 5 to 24 feet below ground. Groundwater throughout much of the study area, particularly on level ground, is very near the ground surface. Many areas, especially on the northeasterly side of the lake, have perched water tables at or above the ground surface during early spring. The DEQ has established nitrate priority areas for the state. Area wells have not experienced high nitrate concentrations and the study area is not within a nitrate priority area.

1.2.3. Fauna, Flora, and Natural Communities

Those species documented in Valley County near Donnelly that are listed as endangered, threatened, proposed, and candidate species by U.S. Fish and Wildlife Service (USFWS) are listed below:

- Threatened: Northern Idaho Ground Squirrel, Bull Trout, Canada Lynx, Whitebark Pine
- Candidate: Monarch Butterfly
- Proposed Threatened: North American Wolverine
- Under Review: Little Brown Bat, Gray Wolf

None of these species are anticipated to be found within the NLRSWD WWTP area or reuse sites.

1.2.4. Land Use Including Housing and Commercial Development

Land use within the study area includes public and private timbered areas, agricultural and grazing lands, campground, church retreats, recreational homes/cabins, year-round homesites, and trailer homes. The Tamarack Resort is a four-season resort which provides recreation and attracts tourism year-round. The residential sites are generally clustered around the reservoir. The land use surrounding the WWTP is used for timber or farming and harvesting of grasses. Industrial facilities within the areas are confined to propane suppliers, and commercial facilities are tailored to recreation and tourism, such as motels, grocery stories, gas stations, shops, and restaurants.

1.2.5. Cultural Resources

The National Park Service's National Register of Historic Places lists the John Korvola, the Jacob and Herman Mahala, and the Jacob Maki Homesteads as historical resources in the Donnelly area. However, these sites do not overlap with the WWTP or reuse sites. No archaeological sites are listed for the planning area.

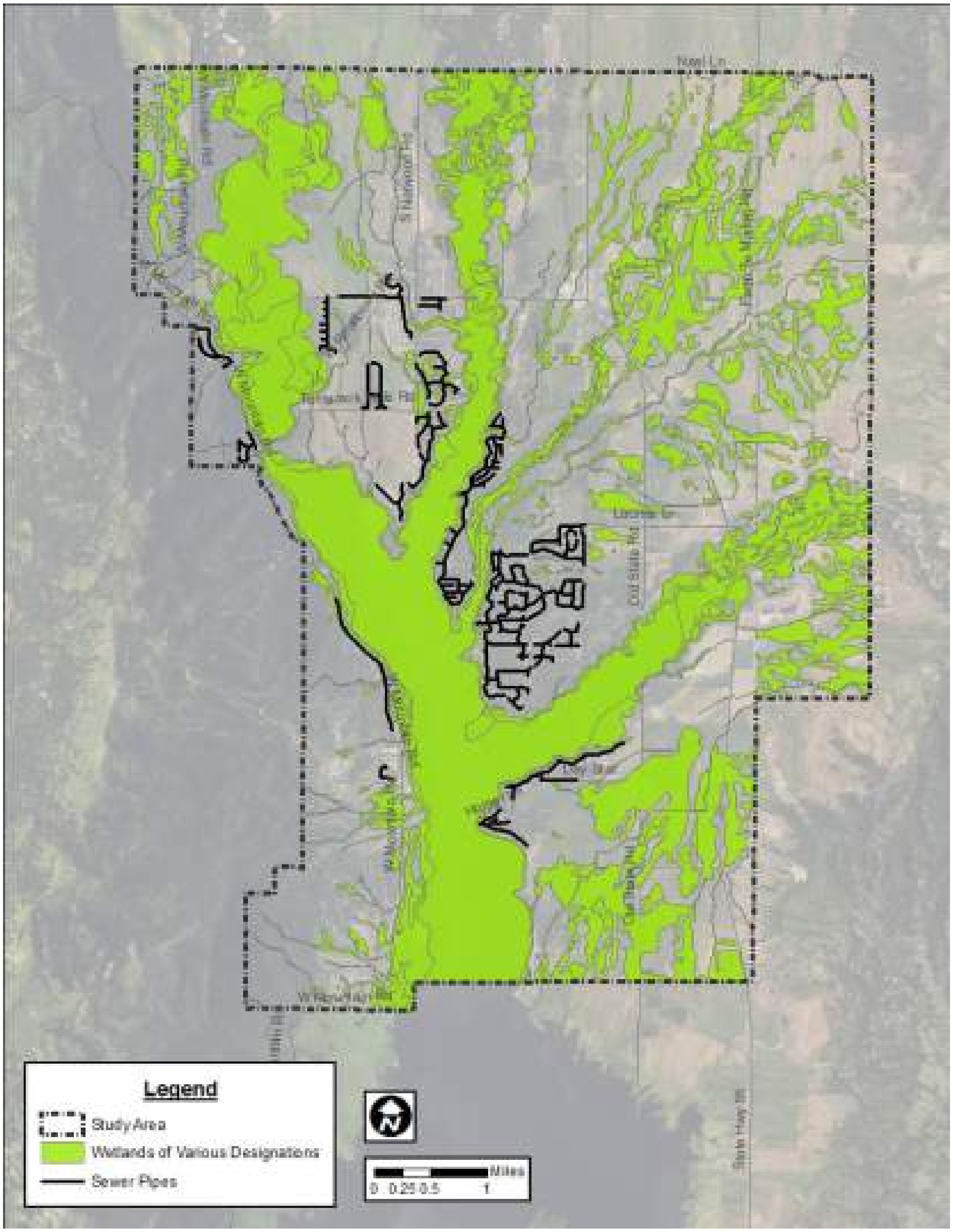
1.2.6. Utility Use

An analysis of wastewater flows was completed using data collected at the WWTP and the Poison Creek Lift Station (Tamarack). The analysis showed that, on average, the total system usage was 32 gallons per capita per day. Additionally, the Tamarack area produces approximately 70% of the wastewater. Water usage was higher, with system average day usage of 92 gallons per capita per day.

1.2.7. Floodplains and Wetlands

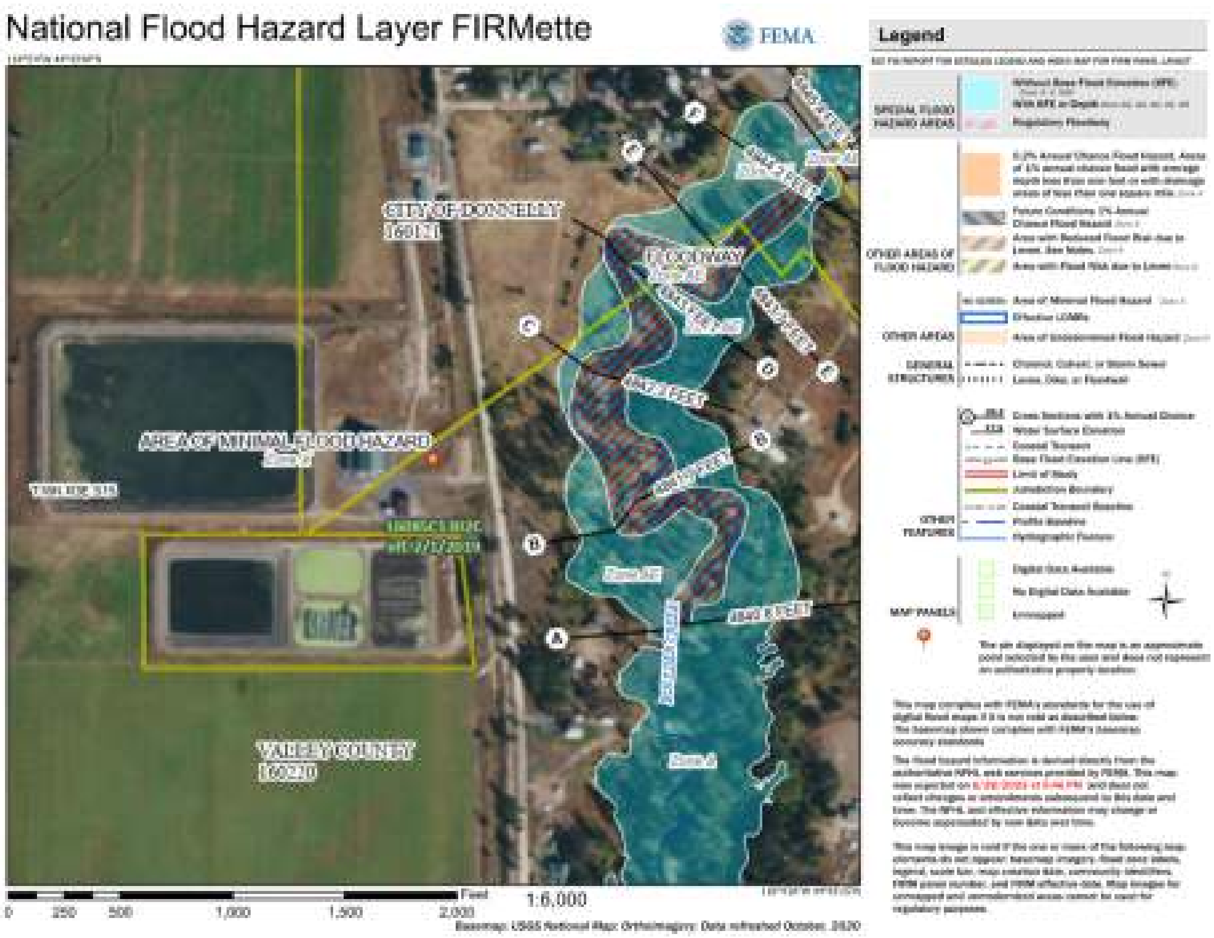
There are several mapped floodplains within the service area, namely resulting from the flows of the North Fork of the Payette River, Lake Fork, and the Gold Fork River. These floodplains are relatively small in nature and usually within the existing 20 to 100 feet wide river channels. Figure 1-2 shows the wetlands with respect to the study area.

FIGURE 1-2: WETLANDS WITHIN STUDY AREA



There is a mapped floodplain for Boulder Creek, which traverses just east of the WWTP, as shown in Figure 1-3. The map shows that the WWTP is in an area of minimal flood hazard. Any facilities to be developed would need to consider proximity to Boulder Creek and ensure that it be located above the reported flood elevations or flood proofed.

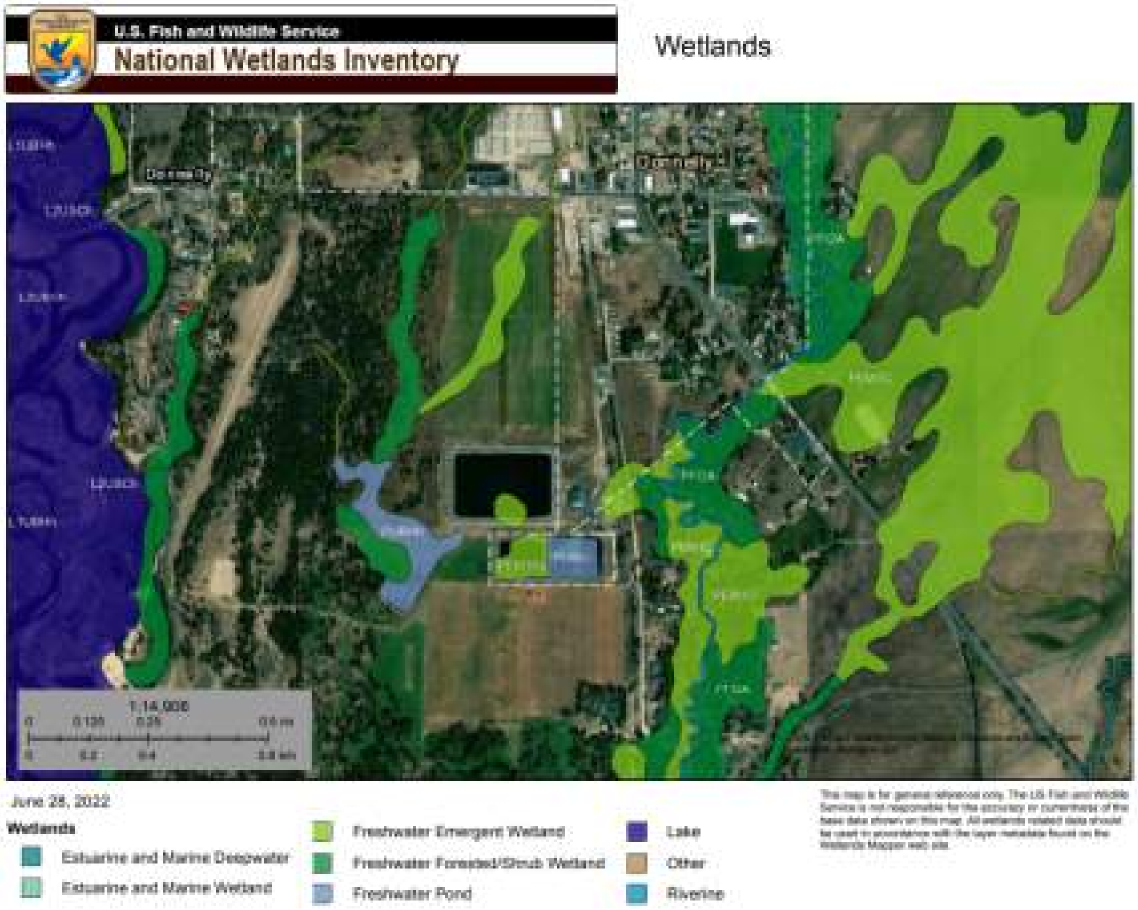
FIGURE 1-3: FEMA FLOOD PLAIN MAP NEAR WWTP



The National Wetlands Inventory through the USFWS provides geographic information system (GIS) data outlining surface waters and wetlands. Multiple locations within the City of Donnelly and bordering Boulder Creek are classified as wetlands. The locations near the WWTP are largely confined to bordering Boulder Creek or irrigation canals surrounding the land application sites. These sites are outlined in Figure 1-4.

For any projects that involve disturbances to jurisdictional wetlands, formal consultation with the U.S. Army Corps of Engineers, the Idaho Department of Water Resources, and the Idaho Department of Lands will be required to obtain nationwide 404 permits for stream crossings or wetland alteration.

FIGURE 1-4: NATIONAL WETLANDS INVENTORY NEAR WWTP



1.2.8. Wild and Scenic Rivers

There are no designated or proposed wild and scenic rivers in NLRSWD, or within the vicinity of the WWTP and land application sites.

1.2.9. Public Health and Water Quality Issues

The reuse sites are irrigated according to agronomic rates, therefore minimizing runoff and impact to surface waters. Treated wastewater discharged to the District's land application site must meet disinfection requirements from their reuse permit. Isolated incidents of disinfection violations have occurred but are few. During the 2020 reuse applications season, several violations of the coliform limit occurred, but was credited to issues with sampling and higher strength influent wastewater. The sampling strategy and chlorine dose was adjusted, and no other coliform exceedances occurred. Statements from the DEQ indicate that treatment practices by the District are able to meet groundwater requirements.

1.2.10. Proximity to a Sole Source Aquifer

A sole source aquifer is an aquifer that supplies at least 50 percent of the drinking water for its service area, and there is no reasonably available alternative drinking water source should the aquifer become contaminated. The major sole source aquifer in Idaho is the Eastern Snake River Plain Aquifer, which is highlighted in Figure 1-5, as well as the location of the WWTP. The District is outside of any sole source aquifer designations.

FIGURE 1-5: SOLE SOURCE AQUIFERS

1.2.11. Prime Agricultural Farmland

The land surrounding the WWTP is not classified as prime farmland, “farmland of statewide importance, if irrigated”, by the Natural Resources Conservation Service (NRCS).

1.2.12. Coastal Resources

The Coastal Zone Management Act does not list any area in Idaho as a coastal resource; therefore, no coastal area will be affected by the proposed improvements.

1.2.13. Precipitation, Temperature, and Prevailing Winds

Precipitation, Temperature, and Wind data was collected from the Western Regional Climate Center (WRCC). A climate summary for McCall (1905 through 2016), which is approximately 15 miles from Donnelly, shows average minimum temperatures ranging from 10.6°F to 44.2°F and average maximum temperatures ranging from 30.3°F to 81.0°F. Over this same period, the total annual precipitation averaged 26.19 inches with a snowfall average of 134.2 inches. The wettest month on average is December; the driest month is July. Snowfalls can be heavy, with short growing seasons. Snowmelt in the spring results in large volumes of runoff and standing water in some of the flatter areas.

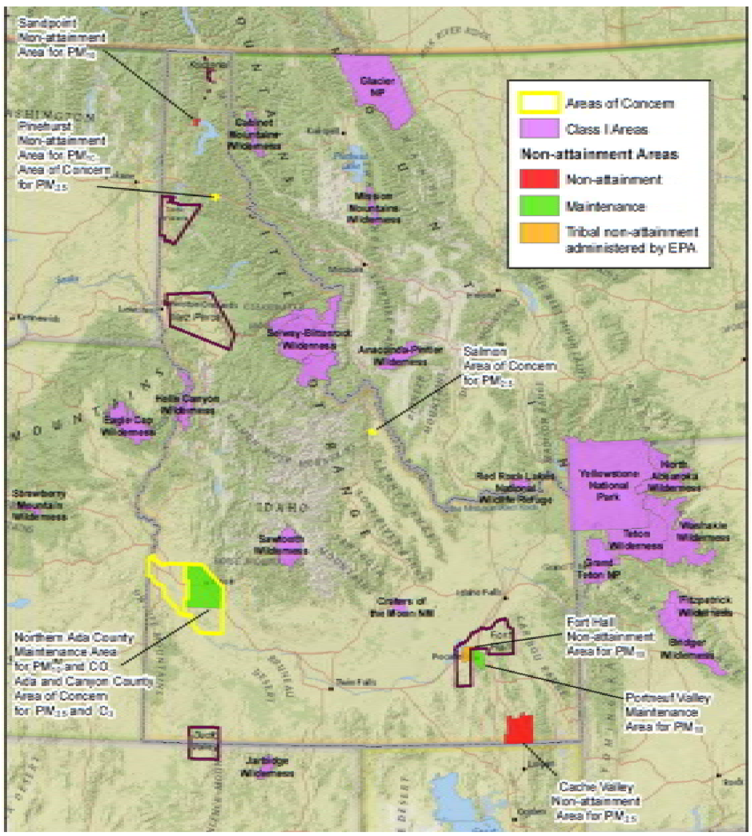
Based on WRCC wind data, the prevailing wind direction is from the south, but during the summer months the winds can be from the north. Average wind speeds range from 2.7 to 5.6 mph, although winds can vary according to the season.

1.2.14. Air Quality and Noise

Idaho is among the states that have delegated authority from EPA to issue air quality permits and enforce air quality regulations. DEQ's air protection efforts are intended to ensure compliance with federal and state health-based air quality regulations. The Clean Air Act of 1970 identified six common air pollutants of concern, called "criteria pollutants." These criteria pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. Fugitive dust is also closely regulated as it contributes to particulate matter. DEQ monitors air quality and publishes air quality information.

The District is not in an area of concern, Class I area, or non-attainment area. Additionally, no noise issues have been identified for the area. A map of areas with sensitive air quality is shown in Figure 1-6.

FIGURE 1-6: AIR QUALITY MAP



1.2.15. Energy Production and Consumption

The NLRSWD does not produce any energy. Energy used by the wastewater system is comprised primarily of pumping from lift stations, aerators in the lagoons, the MBR treatment system at the WWTP, and irrigation pumping.

1.2.16. Socio-Economic Conditions

Major employers in the area are state and local government, farming, logging, mining, and related services. Tourism and recreation are the major attractions drawing people to the region.

With periodic increases in utility rates, the District will be able to continue funding proposed improvements. There are no poor or disadvantaged groups that will be adversely impacted; conversely, such groups would benefit by the improved wastewater system.

Historical and projected populations are presented in Section 1.3.

1.3. POPULATION TRENDS

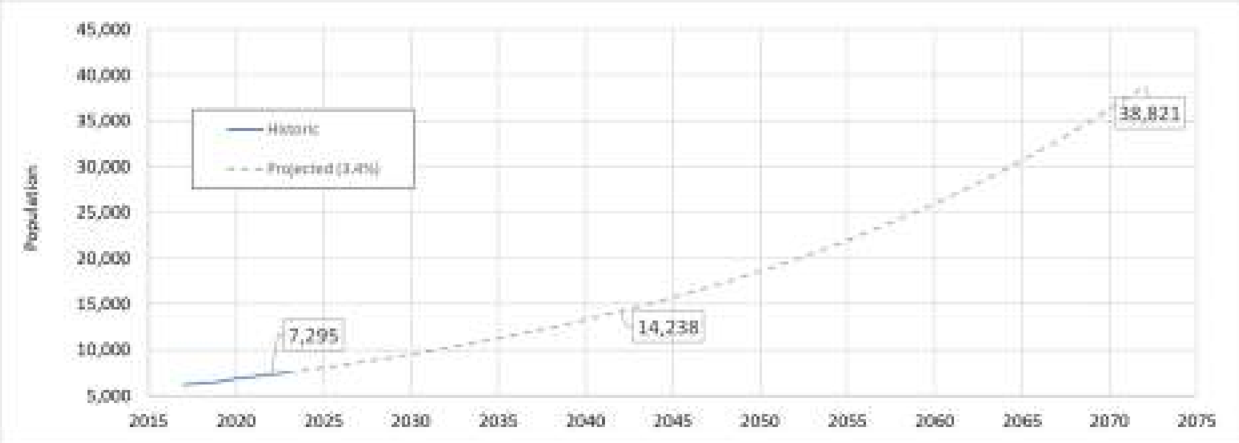
Table 1-1 summarizes the historical equivalent dwelling unit (EDU) numbers and estimated population based on a people per household value of 2.78, as reported for Valley County by the U.S. Census Bureau. The NLRSWD has seen steady historical growth. The District has maintained an average of 2-3% growth between 2017 and 2022, with a 5% spike observed in 2019. Valley County has observed an average growth of 3.4% from 2015 to 2020. The County growth rate of 3.4% was selected by the District to estimate the population for the 20 and 50-year planning horizons.

TABLE 1-1: NLRSWD HISTORICAL AND PROJECTED POPULATION

	Year	Estimated Population	EDU
Historical	2017	6,255	2,250
	2018	6,400	2,302
	2019	6,550	2,356
	2020	6,900	2,482
	2021	7,095	2,552
	2022	7,295	2,624
Projected	2027	8,623	3,102
	2032	10,192	3,666
	2037	12,046	4,333
	2042	14,238	5,122
	2047	16,829	6,054
	2052	19,891	7,155
	2057	23,510	8,457
	2062	27,788	9,996
	2067	32,845	11,815
	2072	38,821	13,964

Assuming the growth rate and same household size, the NLRSWD population would be approximately 14,238 in 2042 and 38,821 in 2072. Figure 1-7 illustrates the historical and projected future populations.

FIGURE 1-7: POPULATION PROJECTION

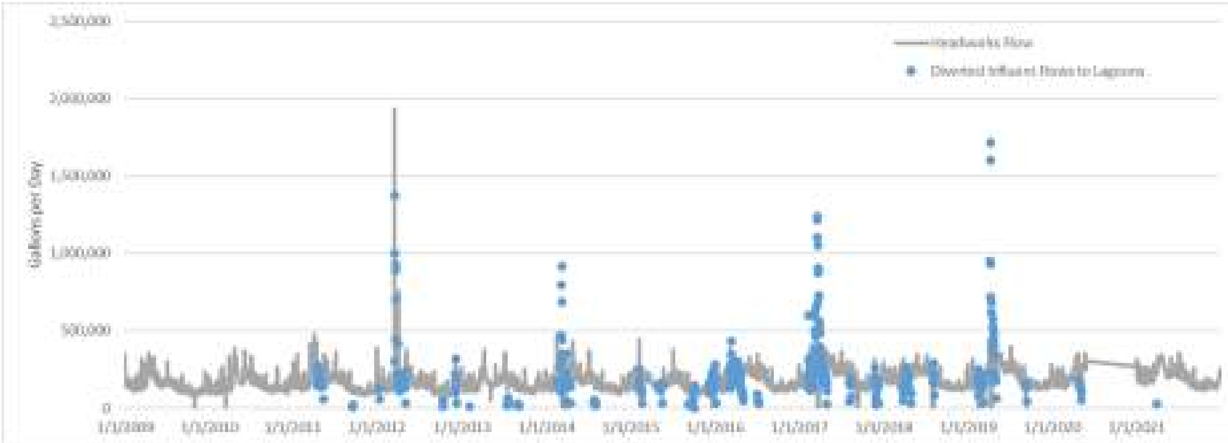


1.4. INFLUENT FLOW ANALYSIS

This section summarizes the historical wastewater flows into the WWTP and develops planning criteria for projecting future flows during the planning period. The planning period flows include the average day flow (ADF), maximum month flow (MMF), maximum day flow (MDF), and peak hour flow (PHF). The ADF is the average daily flow for the calendar year (January to December). MMF represents the highest monthly average flow into the WWTP for the year. The MDF represents the maximum day flow recorded each year. The PHF represents the highest hourly flow at the WWTP. The District does not maintain hourly influent flow records, therefore the PHF was estimated using Ten State Standards (Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environment Managers, 2014). Ten State Standards estimates the peaking factor for the peak hour flow based on the average day flow using the population. The peaking factor using this method is 3.15 times the average day flow.

The District has a SCADA system to track daily flow into the WWTP. Records received from the District date back until January 2009. SCADA records show that wastewater flow is primarily directed to the MBR treatment plant but can be diverted to the lagoon system during peak events. For this planning study, it was assumed that peak events would continue to be diverted in the future. Flow analysis for the WWTP focused on the influent flows strictly to the headworks of the MBR treatment plant that were documented by the SCADA system. Flow analysis for the collections system included flows to the MBR plant and flows diverted to the lagoon system to properly account for high flows seen during peak events. Figure 1-8 demonstrates the daily headworks influent flow (grey) and also the flow diverted to the lagoons (blue) from 2009 through 2021. Flow data from July 2020 to December 2020 was not received.

FIGURE 1-8: HISTORICAL DAILY FLOW



Due to the large amount of data, the 99.5 and 0.5 percentiles were assumed to be outliers. Table 1-2 presents historical flow summaries for the MBR WWTP for ADF, MMF, MDF, and PHF in million gallons per day (MGD). EDU and population data was only available from 2017 to 2021. Since PHF is estimated based off population, PHFs were only estimated from 2017 to 2021.

TABLE 1-2: MBR WWTP FLOW SUMMARY (MGD)

Year	ADF	MMF	MDF	PHF
2009	0.154	0.234	0.357	-
2010	0.160	0.243	0.385	-
2011	0.170	0.260	0.423	-
2012	0.155	0.240	0.406	-
2013	0.157	0.217	0.377	-
2014	0.171	0.256	0.428	-
2015	0.150	0.204	0.376	-
2016	0.175	0.249	0.389	-
2017	0.203	0.335	0.427	0.640
2018	0.191	0.261	0.346	0.602
2019	0.185	0.308	0.414	0.581
2020	0.212	0.268	0.357	0.661
2021	0.202	0.300	0.359	0.625

Table 1-3 presents flow data into the MBR WWTP in gallons per capita per day (gcpd). The planning criteria selected for projecting future flows is the maximum of the 2017 to 2021 gpcd values.

TABLE 1-3: MBR WWTP PLANNING CRITERIA FLOWS (GCPD)

Parameter	2017	2018	2019	2020	2021	Planning Criteria
Population	6,255	6,400	6,550	6,900	7,095	-
ADF	32	30	28	31	28	**32**
MMF	54	41	47	39	42	**54**
MDF	68	54	63	52	51	**68**
PHF	102	94	89	96	88	**102**

Table 1-4 presents a summary of the collection system planning criteria. Flow analysis for the collection system included the peak events from the combined flow to both the headworks and the lagoon system. Planning criteria for the collection system was developed using the same method that was used in the MBR WWTP flow analysis. The current planning criteria was 262 gpcd (1.91 MGD) for the MDF and 394 gpcd (2.87 MGD) for the PHF (utilizing the same 1.5 peaking factor PHF/MDF shown in Table 1-3). A smaller future planning criteria is used because the precipitation, snowmelt, and irrigation are not expected to increase as fast as the population with the newer, tighter collection system piping.

TABLE 1-4: COLLECTION PLANNING CRITERIA FLOWS (GCPD)

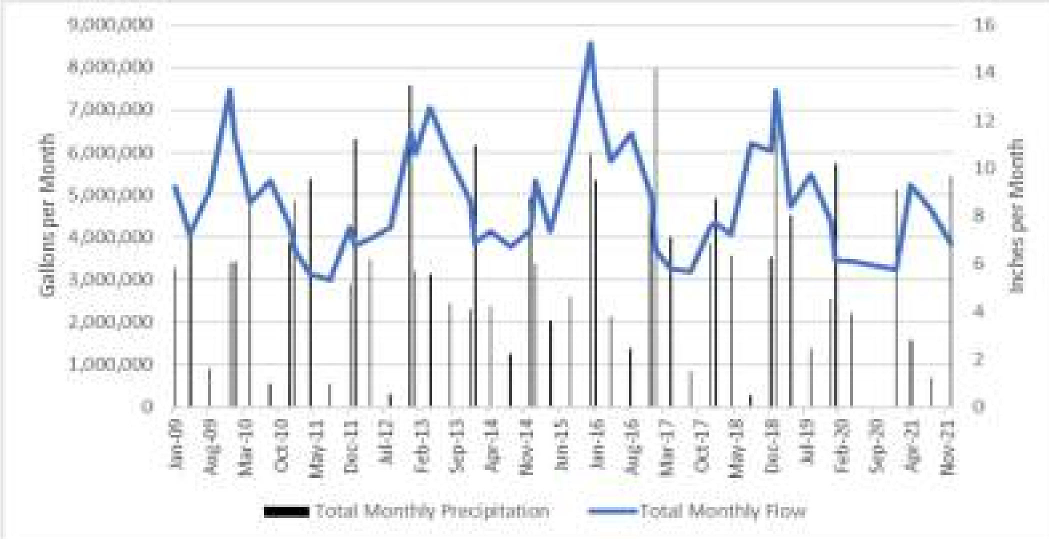
Parameter	2017	2018	2019	2020	2021	Current Planning Criteria	Future Planning Criteria
Population	6,255	6,400	6,550	6,900	7,095	-	-
MDF	258	84	262	71	51	**262**	**145**
PHF	387	126	394	107	76	**394**	**218**

1.4.1. Infiltration and Inflow (I/I)

Infiltration and Inflow (I/I) refers to the groundwater and storm water that enters the wastewater collection system. The United States Environmental Protection Agency (EPA) considers flows more than 120 gpcd as excessive I/I (Sewer System Infrastructure Analysis and Rehabilitation, EPA/625/6-91/030, October 1991). The maximum day flow rates observed from 2017 to 2021 were 262 gcpd, which is greater than 120 gcpd in the EPA guidance, indicating excessive I/I.

In Figure 1-9 the total monthly rainfall totals for the McCall area, acquired from the National Oceanic and Atmospheric Administration, are compared to the monthly headworks influent flows. The highest flows consistently occur between March and May. This indicates that precipitation, snowmelt, and irrigation during the growing season (May to October) may be reasons for increased flows in the wastewater system. Not all precipitation events directly result in a spike in headworks influent flows. Generally, systems experiencing high inflow will see an immediate increase in flow in response to large precipitation events, but this was not always the case. The District's employees indicate that periods of spring snowmelt correlate with high flows, and that the Tamarack wastewater collection may be more impacted by I/I which is a location that the District has been focusing on inspection and making repairs.

FIGURE 1-9: MONTHLY INFLUENT FLOW VS. MONTHLY PRECIPITATION



1.5. FLOW PROJECTIONS

For the MBR WWTP, the future planning criteria flows are shown in Table 1-5. These were established using the planning criteria in Table 1-3 and projected populations in Table 1-1 to calculate the future ADF, MMF, MDF, and PHF. It was assumed the current mix of residential, recreational, and commercial flows would increase proportional to the increased population. The 20-year (2042) flows will be used when evaluating the current MBR WWTP's capacity.

TABLE 1-5: PROJECTED MBR WWTP INFLUENT FLOWS (MGD)

Year	ADF	MMF	MDF	PHF
2022	0.237	0.390	0.497	0.746
2027	0.280	0.462	0.588	0.882
2032	0.331	0.545	0.695	1.04
2037	0.391	0.645	0.821	1.23
2042	0.462	0.762	0.971	1.46

For the collection system, the future flows are shown in Table 1-6. These were established using the planning criteria in Table 1-4 and projected populations in Table 1-1. Again, the precipitation, snowmelt, and irrigation, are not expected to have as much impact on newer, tighter collection system piping; therefore the future flows per person are expected to be less.

TABLE 1-6: PROJECTED COLLECTION SYSTEM INFLUENT FLOWS (MGD)

Year	MDF	PHF
2022	1.91	2.87
2042	2.92	4.38
2072	6.49	9.74

To assess the holding capacity of the winter storage lagoons, the 2042 ADF for the combined collection system flow is estimated at 0.51 MGD; therefore, the total annual flow in 2042 is projected to be 186 MG.

1.6. INFLUENT LOADING PROJECTIONS

The District does not receive wastewater from industrial facilities, and is not expecting any to connect during the planning period. However, there are a few commercial facilities. These commercial facilities are mainly service-oriented businesses. The District expects its customers to provide domestic-strength wastewater, pay connection fees, and be billed for usage on the appropriate EDU basis. Beginning in 2018, the District began accepting septage and has since developed a new septage receiving station. Septage is currently screened and directed to the lagoons for treatment. Sludge from this lagoon is expected to be removed and disposed of at a landfill. For the purposes of this planning study, septage was not included in the loading projections as it is not directed through the MBR treatment system.

The District did not have a large amount of influent concentration data. Anticipated future influent loadings (pounds per capita per day (ppcd)) were assumed using industry-standard values and are shown in Table 1-7 Similarly, industry standard peaking factors of 1.30 for five-day biochemical oxygen demand (BOD_5), 1.30 for total suspended solids (TSS), 1.15 for total Kjeldahl nitrogen (TKN), and 1.12 for phosphorus were used for the maximum month flows (Metcalf & Eddy/AECOM, 2014).

TABLE 1-7: INFLUENT LOADING ASSUMPTIONS

Criteria	Average Daily Load	Maximum Month Peaking Factor
BOD_5	0.17	1.30
TSS	0.20	1.30
TKN	0.030	1.15
TP	0.0048	1.12

The future loads (pounds per day) during the planning period are shown in Table 1-8. The planning period loading parameters include the average day load (ADL) and maximum month load (MML). The ADL is the average daily load for the year and the MML represents the highest monthly average load for the year.

TABLE 1-8: PROJECTED INFLUENT LOADS (PPD)

Year	2022	2027	2032	2037	2042
Population	7,295	8,623	10,192	12,046	14,238
BOD_5					
ADL	1,240	1,466	1,733	2,048	2,420
MML	1,612	1,906	2,252	2,662	3,147
TSS					
ADL	1,459	1,725	2,038	2,409	2,848
MML	1,897	2,242	2,650	3,132	3,702
TKN					
ADL	219	259	306	361	427
MML	252	297	352	416	491
TP					
ADL	35	41	49	58	68
MML	39	46	55	65	77

NLRSWD provided the results of five influent samples. The concentrations ranged from 133 – 166 mg/L BOD_5, 120 – 174 mg/L for TSS, 37.9 – 52.3 mg/L for TKN, and 5.47 – 9.04 mg/L for TP. These concentrations are lower than the industry-standard loadings shown in Table 1-6. The concentrations may not be representative. The District will continue to perform testing to confirm the influent loads.

1.7. REGULATORY REQUIREMENTS

The District currently discharges effluent wastewater to storage lagoons during the winter months and utilizes land application to farm fields during the growing season. Rapid infiltration basins are available as an option for excess flow. However, they have only been used while seepage testing the lagoons and from March 2017 through June 2017 because of concerns of the storage lagoons overflowing due to substantial snowmelt. The WWTP operates in accordance with Reuse Permit No. LA-000070-04 (Appendix A) and IDAPA 58.01.17 (Idaho's Recycled Water Rules). Regulatory requirements include plan of operations, runoff management plan, waste solids management plan, grazing management plan, seepage testing, flow rate monitoring, and groundwater and soils monitoring. The permit expired on December 20, 2015, but has been administratively extended. The District has applied to renew the Permit and is currently waiting for DEQ to approve the new permit.

The reuse permit specifies a Class C effluent (Table 1-9) and includes limits for certain wastewater constituents. The maximum nitrogen loading (wastewater, manure, fertilizers, and supplemental irrigation water) must be less than or equal to 150% of typical crop uptake for the land application fields. The maximum chemical oxygen demand (COD) loading for each field is 50 pounds/acre-day. The RI basins have a maximum phosphorus loading of 8.3 kilograms per month, 10 mg/L total nitrogen concentration, and 100 mg/L as a 30-day average for TSS. The disinfection requirement is a median number of total coliform organisms less than or equal to 23 per 100 mL, based on the last five days of sampling, with no sample exceeding 230 organisms per 100 mL.

TABLE 1-9: RECYCLED WATER CLASSES AND SOME EXAMPLE USES

	Class A	Class B	Class C	Class D
Typical Treatment Requirements				
Oxidized	X	X	X	X
Coagulated and Clarified	X	X	-	-
Filtered	X	X	-	-
Disinfected	X	X	X	X
BOD_5, mg/L	5 - 10	-	-	-
Total Nitrogen, mg/L	10 (or stricter) - 30	10 (or stricter) - agronomic rate	agronomic rate	agronomic rate
Turbidity, NTU	0.2 - 5	5 - 10	-	-
pH	6.0 - 9.0	-	-	-
Total Coliform, no./100 mL	2.2 - 23	2.2 - 23	23 - 230	230 – 2,300
Virus	5-log reduction	-	-	-
Allowable Uses				
Fodder, fiber, or processed food crops	X	X	X	X
Pasture: not producing milk for human consumption	X	X	X	X
Pasture: producing milk for human consumption	X	X	X	-
All edible food crops	X	X	-	-
Golf courses	X	X	-	-
Parks: non-use periods	X	X	-	-
Parks: use periods	X	-	-	-
Home irrigation	X	-	-	-
Groundwater recharge	X	-	-	-

Table 1-7 provides typical treatment requirements for the different recycled water classes along with some allowable uses. Classes A-D are shown in the table; Class E is not shown as it has the fewest uses. If the District desires to consider another classification or different use, a different permit would be required.

In addition to the limits mentioned previously, there are also hydraulic limits established to balance protection of groundwater and crop requirements. This typically translates to irrigating at agronomic rates to match the net irrigation requirements of the crops. Allowable agronomic rates are based on historical precipitation deficit values from ETIdaho -- Evapotranspiration and Net Irrigation Requirements for Idaho and typical irrigation efficiencies for the application equipment.

The effluent is land applied during the growing season, which is May 1 through October 15. The predominant crops are Timothy Grass and pasture grass. Wastewater is typically insufficient to meet the irrigation water requirement (IWR) of the crops and supplemental water is added as necessary from a nearby canal. Groundwater and soil parameters are also monitored to evaluate the impact of the land application and rapid infiltration facilities on local groundwater and soil, as required by the reuse permit. There are also buffer zones between wells, dwellings, surface water, irrigation ditches, and public access. The RI basins are able to be used year-round.

It is difficult to predict whether substantive changes will be included within the District's upcoming reuse permit. No formal communications regarding potential changes have been provided by DEQ, other than the likely requirement for a Quality Assurance Project Plan. Within the general wastewater industry, a class of 'emerging contaminants' has been discussed with increasing frequency as the attention of regulators has turned from nutrient pollutants to other constituents. It is not anticipated that limitations will be imposed for these contaminants soon; however, the potential for permit implications is possible. Among these emerging contaminants are 'forever chemicals', such as per- and polyfluoroalkyl substances (PFAS) and pharmaceuticals and personal care products (PPCPs).

Discharges to waters of the United States require a permit as a provision of the Clean Water Act. Boulder Creek is located approximately 0.25 miles east of the WWTP and discharges into the Cascade Reservoir. Boulder Creek does not have specific use designations in Idaho, but "undesignated waterways" are to be protected for the uses of cold water aquatic life and primary contact recreation. Idaho has authority to administer and enforce the Idaho Pollutant Discharge Elimination System (IPDES) program for surface waters in Idaho other than tribal lands and tribal waters. An IPDES permit would likely contain limitations that comply with the approved total maximum daily load (TMDL) associated with the Cascade Reservoir and beneficial uses for the watershed. Criteria to protect cold water aquatic life involve in-stream temperature conditions of 19ºC on average and a daily maximum of 22ºC. Turbidity requirements shall not exceed 50 NTU instantaneously, or more than 25 NTU for more than 10 consecutive days. Additionally, dissolved oxygen should exceed 6 mg/L at all times, while pH should be in the range of 6.5 to 9.0.

The reservoir is highly susceptible to algae blooms due to nutrient loading and elevated summer water temperatures. The TMDL contains a waste load allocation for phosphorus as 1.8 lbs. per day or 3 mg/L. Lake temperatures can affect the reservoir's TMDL; however, according to IDAPA 58.01.01.080.03, exceeding the temperature criteria cannot be considered a water quality standard violation when the air temperature exceeds the 90th percentile of the 7-day average daily maximum air temperature calculated in yearly series over the historic record measured at the nearest weather reporting station. Jug Mountain Ranch, discharges to Cold Creek, a tributary to Boulder Creek. Additional conditions for monthly averages in the Jug Mountain Ranch discharge permit are 5 mg/L BOD5, 7.7 mg/L TSS, 126 per 100 mL as E. Coli, 3.1 mg/L total ammonia, 3.86 mg/L as nitrite, and 10 mg/L as total nitrogen. In order to meet these discharge limits, improvements to the WWTP would be required. Additionally, the WWTP would need to obtain a discharge permit, which is a significant process. For these reasons, surface water discharge is not recommended to be investigated further.

1.8. COMMUNITY ENGAGEMENT

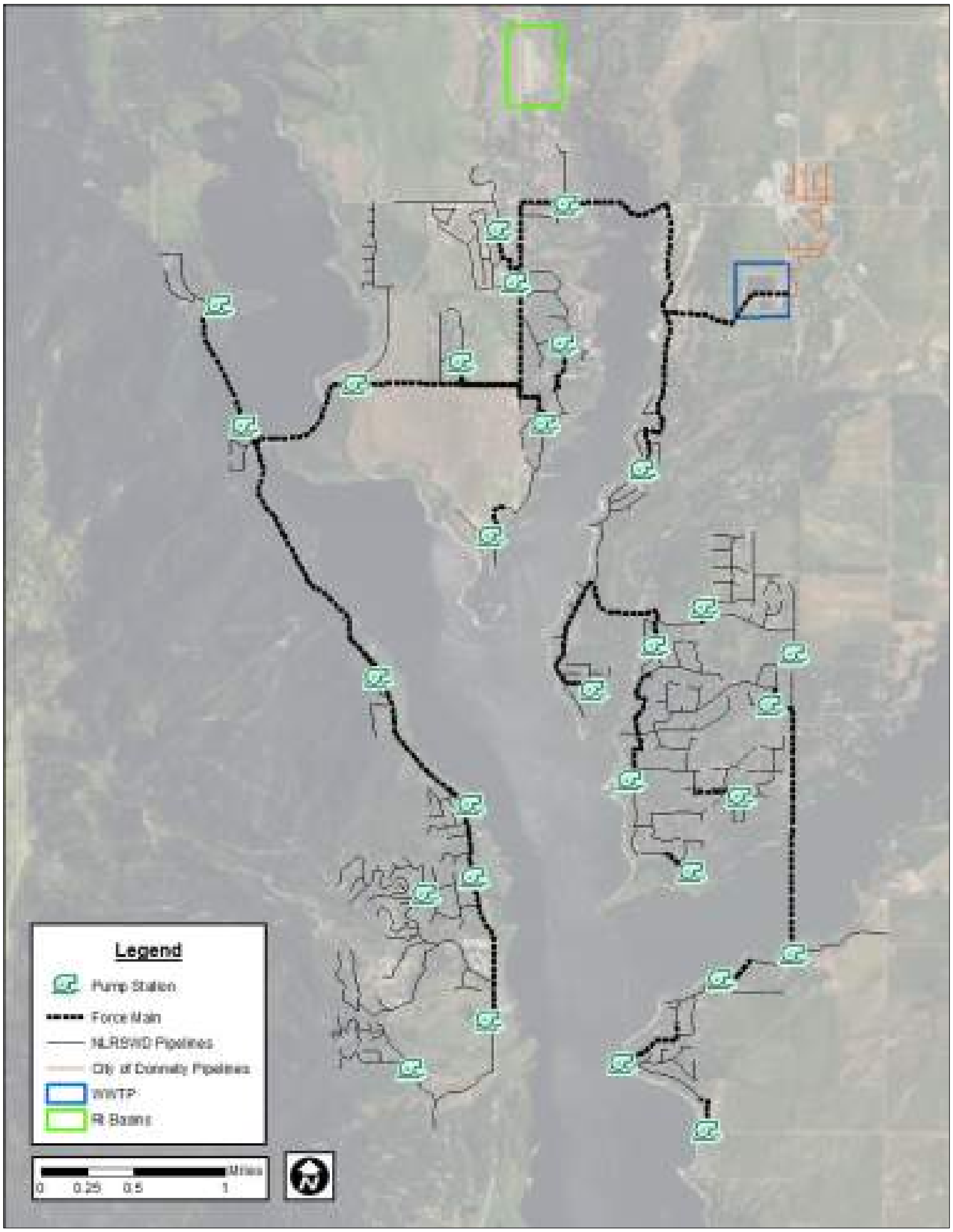
The District plans to conduct a town hall meeting as part of the community engagement requirement of the project following the approval of the Facility Plan Report. A town hall meeting will be made open to the public to help the community develop an understanding of the need for the project, the utility operational service levels required, and the funding and revenue strategies used to complete the project.

CHAPTER 2 - COLLECTION SYSTEM CONDITIONS

2.1. LOCATION

The NLRSWD is located around the northern region of Lake Cascade in Valley County, Idaho. The WWTP is located near the present southwest corner of Donnelly, Idaho. An aerial view of the wastewater facilities is shown in figure 2-1.

FIGURE 2-1: WASTEWATER SYSTEM MAP



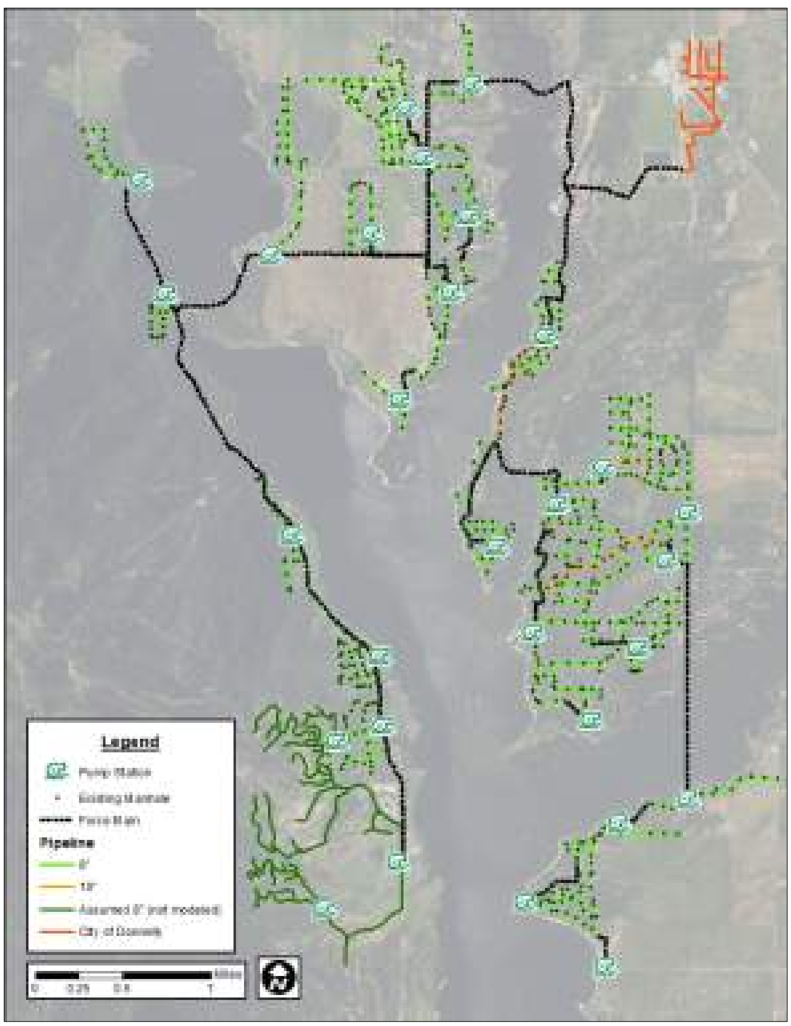
2.2. HISTORY

Since the opening of Tamarack Resort in 2004, development conditions changed significantly on the north side of Lake Cascade. The NLRSWD agreed to provide sewer service to the resort, and requests for sewer service by other developers also increased substantially. The existing lagoon treatment system and slow rate land application disposal system were inadequate for the projected flows. A membrane bioreactor (MBR) process was constructed in 2008 to provide high quality effluent suitable for discharge to rapid infiltration (RI) basins. The old lagoons are used for septage treatment and treatment of flows from the Hartley Lift Station. The effluent from both the MBR and lagoon plants combine and are stored in a winter storage lagoon. Biosolids from the MBR are pumped to the first treatment lagoon.

2.3. COLLECTION SYSTEM DESCRIPTION

The NLRSWD wastewater collection system consists of approximately 39 miles of gravity sewer lines, 17 miles of pressure sewer lines, 29 lift stations, and close to 1,000 manholes, as shown in figure 2-2. The system of lift stations delivers wastewater to the District's wastewater treatment plant located on Eld Ln, approximately 0.5 miles south of downtown Donnelly, Idaho.

FIGURE 2-2: COLLECTION SYSTEM OVERVIEW



2.4. PUMP STATIONS

On July 22-23, 2021, Keller Associates visited each pump station with NLRSWD staff to observe visual equipment condition and document any known issues, as well as perform pump tests. The District owns 28 and operates 29 pump stations. The pump stations are listed by number: P-X (X=1-21, 25-27, 35-38, and 40). There are no pump stations 22-24, 28-34, and 39. The locations of the pump stations are shown in figure 2-3. figure 2-4 contains a visual representation of how flow is conveyed between pump stations. Each pump station was designed to be equipped with two submersible, constant speed, non-clog pumps. Hawks Bay and Meadows are exceptions, as they are triplex pump stations. All the pump station wet wells are circular, ranging in diameter from five to 12 feet. Each of the pump stations are equipped with either an ultrasonic or submersible level sensor and an auto-dialer alarm system. The only exception is Hawks Bay, which is not equipped with an auto-dialer or other form of alarm telemetry.

FIGURE 2-3: PUMP STATION LOCATIONS

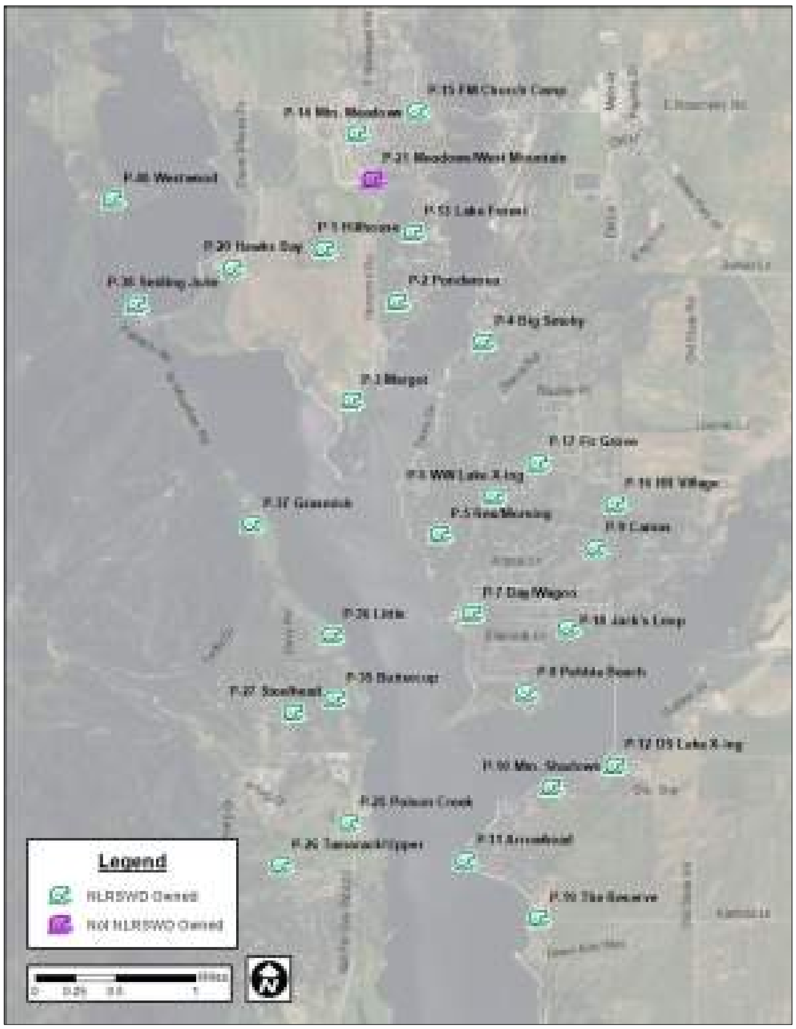
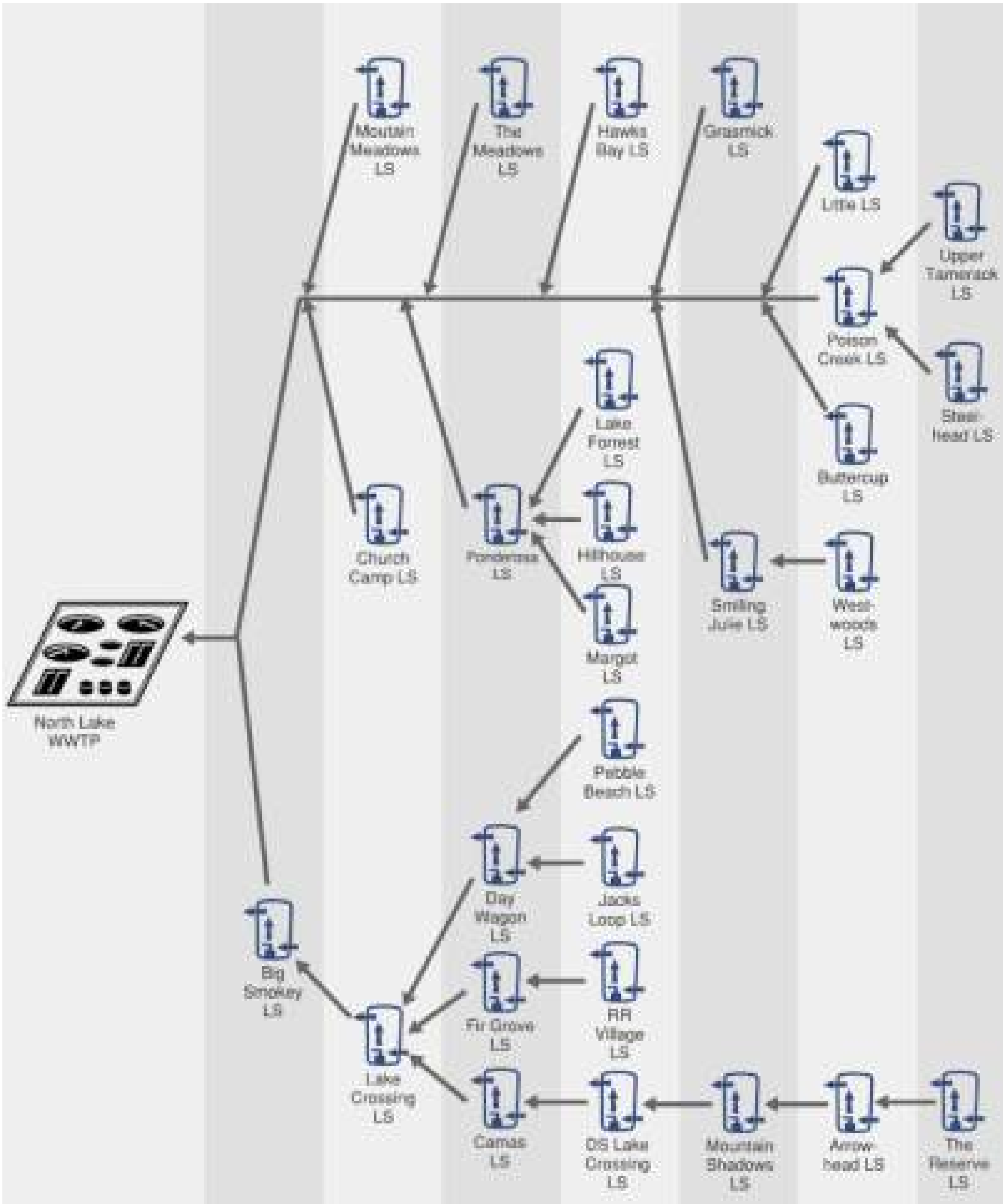


FIGURE 2-4: PUMP STATION LOCATIONS



A conditions assessment based on the facility tours, information from NLRSWD staff, and other available information (record drawings, documented data, etc.) has been compiled in this section. A summary of each pump station's equipment is presented in TABLE 2-1. Following the summary table, this section then presents a general description, identifies deficiencies, and documents the results of pump tests for each pump station. P-16 RR Village and P-26 Tamarack were visually evaluated but did not have a pump test performed.

TABLE 2-1:WASTEWATER LIFT STATION SUMMARY

Pump Station	P-1 Hillhouse	P-2 Ponderosa	P-3 Margot	P-4 Big Smoky	P-5 Rex / Morning	P-6 WW Lake X-ing	P-7 Day / Wagon	P-8 Pebble Beach	P-9 Camas	P-10 Mtn Shadows
Owner	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD
Type	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible
Pump Type	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog
Firm Capacity, gpm	167	222	148	0	36	399	0	176	239	67
Pump, hp	3.7	33.5	3.7	N/A	N/A	N/A	N/A	3.7	3.7	N/A
Level Control Type	Ultra	Ultra	Ultra	Ultra	Ultra	Ultra	Ultra	Ultra	Ultra	Ultra
Flow Meter (Y/N)	N	N	N	N	N	N	N	N	N	N
Auxiliary Power Type	Portable generator	None	Portable generator	None	None	None	None	None	None	None
Transfer Switch	Manual	Manual (not wired)	Manual	None	None	None	None	None	None	None
Bypass Piping (Y/N)	Y	Y (taken off)	Y	Y	Y	Y	Y	N	Y	Y
Alarm Telemetry Type	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer
Wet Well Diamater (ft)	5.0'	8.0'	5.0'	10.0'	5.0'	10.0'	10.0'	5.0'	5.0'	5.0'
Discharge Line Size (in)	4"	6"	4"	6"	4"	4"	6"	4"	4"	4"
Notes	Pipe corroded, no fall protection, solids build-up in wet well, I/I present	Transfer switch not connected, pipe rusted, hardware needs replaced, camlock removed and pressure gauge installed at bypass, pump 2 has vibration issue	Grout popping out at penetrations, pump 1 needs inspection, possible check valve issue, I/I present	Small site, pump 2 is not operational, significant corrosion	Safety latch broken, wet well cracks, pump 1 sounds like it is air locked, level sensor is in way of pump removal	Wet well latch broken, chemical tank not in use	Wet well vent needs redone, pump 2 is not operational, no camlock cap, drain plugged with TP-no valve	Vault handle broken, vault drain plugged	Check valves appear broken, wet well hatch blocks panel access, waste in vaults	Vault drain plugged, submerged valves, electrical corroded, poor access (located in road)

Pump Station	P-11 Arrowhead	P-12 DS Lake X-sing	P-13 Lake Forest	P-14 Mtn Meadows	P-15 FM Church Camp	P-16 RR Village	P-17 Fir Grove	P-18 Jack's Loop	P-19 The Reserve	P-20 Hawks Bay
Owner	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD
Type	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Triplex, Submersible
Pump Type	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog
Firm Capacity, gpm	115	186	81	69	31	No Pump Test	213	82	0	67
Pump, hp	N/A	6	N/A	6.7	4.7	N/A	3	3	3	10.7
Level Control Type	Sub	Ultra	Ultra	Ultra	Sub	Ultra	Sub	Sub	Sub	Sub
Flow Meter (Y/N)	N	N	N	N	N	N	N	N	N	N
Auxiliary Power Type	Portable Generator	None	Portable Generator	None	Portable Generator	None	Portable Generator	Portable Generator	Portable Generator	On-site Generator
Transfer Switch	Manual	None	Manual	None	Manual	None	Manual	Manual	Manual	Automatic
Bypass Piping (Y/N)	Y	Y	Y	Y	Y	N	Y	N	N	Y
Alarm Telemetry Type	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	None
Wet Well Diamater (ft)	5.0'	6.0'	5.0'	5.0'	5.0'	5.0'	8.0'	5.0'	5.0'	8.0'
Discharge Line Size (in)	4"	4"	4"	4"	4"	4"	6"	4"	4"	4"
Notes	No camlock, hatch did not appear to be load rated, snakes	Chemical tank not in use, phase converter	Poor access, Pump 1 is being pulled soon, drain is plugged, ultrasonic is hung by a cord, I/I present	Fall protection not connected, poor access	Pressure gauge installed at bypass, pump 2 was not pumping well (half the flow of Pump 1), no valve on vault drain, no fall protection	Drain plugged, 4x4 wood pipe support, holes not grouted, located in driveway	Penetration not grouted, lots of debris in vault and weeds on site	Water in vault, drain plugged, level controllers need replacing	No penetration grout, soft site, septic trucks sink in sand, no conduit for second pump, PVC line, vault drain plugged, no inflow, sewage leaking in vault, site floods each spring	Floor drain plugged, need air releases, rusty pipes and supports, 1 big pump not sized correctly, pump 2 not installed, panel rocks and is sitting on concrete on ground

Pump Station	P-21 Meadows / West Mountain	P-25 Poison Creek	P-26 Discovery Drive (Tamarack)	P-27 Steelhead (Tamarack)	P-35 Buttercup	P-36 Little Lane	P-37 Grasmick	P-38 Smiling Julie	P-40 Westwoods
Owner	Not owned by NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD	NLRSWD
Type	Triplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible	Duplex, Submersible
Pump Type	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog	Constant speed, non-clog
Firm Capacity, gpm	200	870	No Pump Test	92	193	171	135	114	0 - Pump 1 on order
Pump, hp	10.7	70	4.7	6.7	3.8	6.7	16.8	13.4	6.7
Level Control Type	Sub	Sub, needs replaced	Ultrasonic	Sub (not working right)	Sub	Sub	Sub	Sub (backup floats)	Sub
Flow Meter (Y/N)	N	Y	N	N	N	N	Y	N	N
Auxiliary Power Type	On-site Generator	On-site Generator	Portable Generator	Portable generator	Portable generator	Portable Generator	Portable Generator	Portable generator	Portable Generator
Transfer Switch	Automatic	Automatic	Manual	Manual	Manual	Manual	Manual	Manual	Manual
Bypass Piping (Y/N)	Y	Y	Y	N/A	Y	Y	Y	Y	Y
Alarm Telemetry Type	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer	Dialer
Wet Well Diamater (ft)	8.0'	12.0'	5.0'	5.0'	6.0'	6.0'	8.0'	8.0'	6.0'
Discharge Line Size (in)	4"	4", 10"	4"	4"	4"	4"	4"	4"	4"
Notes	No mixer rails, 2 pumps during runoff, pump 1 installed 2019, bird nest, has hose bibb, ceiling needs paint, control wires exposed, need larger pressure gauges, not owned by NLSWRD	Wood fence (low security), generator housing needs siding, replace level control system, overflow connects to lined pond	Pump 2 struggling, power meter reads "error"	Broken pressure gauge, I/I issues, can't open valve vault (lock stuck), not lined, replace level indicator system, no fall protection, no site water, did not appear to have seal offs to the pumps	Recent injection, insulation on vault lid, appears to be I/I flow, SS vent	I/I, valve vault flooded w/submerged valves, no fence, wet well lined, poor access	Mixer doesn't work, limited parking, pipe rusted, air release drains to vault	Mixer not working, builds up solids, needs air release	Solids buildup, Pump 1 on order, no fence, no locks, pressure gauge range too large

P-1 HILLHOUSE

The Hillhouse Lift Station is located in the northcentral area on Hillhouse Loop, serving the Hillhouse subdivision. This lift station is a duplex submersible with two working pumps and room for a third. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence, lock, or fall protection at the lift station. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, discharge manhole lining, or on-site generator. There is, however, a portable generator connection with a manual transfer switch.

During the site visit, it was observed that there are two pumps installed with space for a third. There was solids buildup in the wet well and piping needing replacement. Concrete is in subpar condition.

Pump Test Results:

A pump test was completed on July 22, 2021. Both pumps were tested for approximately one minute each. Calculated pumping rates for pump 1 and pump 2 were 193 and 167 gpm, respectively.

Hillhouse Lift Station Summary

Pump Station	
Location	13045 Hillhouse Loop
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.7
Pump Test Results (pump 1, pump 2), gpm	193, 167
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, N, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	2 pumps installed, space for 3rd, solids buildup, pipe replace needed, unlined

P-2 PONDEROSA

The Ponderosa Lift Station is located in the northcentral area on Ponderosa Dr., serving the Edwards Ranch subdivision. This lift station is a duplex submersible with two working pumps and room for a third. Wastewater is collected in a circular 8-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 6-inch line. There is no fence or fall protection at the lift station, but there is a lock on the hatch. There is also no air release on the discharge line, flow meter, odor control system, or on-site generator. There is also no portable generator connection. There is a transfer switch, but it was not wired at time of visit.

During the site visit, it was observed that there are two pumps installed with space for a third. Bypass pump provisions were there but taken off. There was a rusted pipe that needs to be replaced along with accompanying hardware. It was recorded that pump 2 sounds strange and produces vibration.

Pump Test Results:

A pump test was completed on July 22, 2021. Both pumps were tested for approximately one minute each. Calculated pumping rates for pump 1 and pump 2 were 274 and 222 gpm, respectively.

Ponderosa Lift Station Summary

Pump Station	
Location	12988 Ponderosa Dr.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	8' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	33.5
Pump Test Results (pump 1, pump 2), gpm	274, 222
Discharge Line Size, in	6"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual, not wired
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y, taken off
Discharge Pressure Gauge (Y/N)	Y
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	2 pumps installed, space for 3rd, gauge on bypass, rusted pipe

P-3 MARGOT

The Margot Lift Station is located in the northcentral area where Norwood Rd. and Margot Dr. intersect, serving the Margot and Edwards Ranch subdivision. This lift station is a duplex submersible with two working pumps and room for a third. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station, but there is a lock on the hatch. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch.

During the site visit, it was observed that there are two pumps installed with space for a third. Grout was popping out. It was recorded that the lift station burps/vibrates (likely due to pump 1), and there is speculation that there might be a broken check valve.

Pump Test Results:

A pump test was completed on July 22, 2021. Both pumps were tested for approximately 35 seconds each. Calculated pumping rates for pump 1 and pump 2 were 161 and 148 gpm, respectively.

Margot Lift Station Summary

Pump Station	
Location	Norwood Rd at Margot Dr
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.7
Pump Test Results (pump 1, pump 2), gpm	161, 148
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N/A
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	2 pumps installed, space for 3rd, grout popping

P-4 BIG SMOKY

The Big Smoky Lift Station is located in the northeastern area on Patty Dr., serving the Big Smoky #1 subdivision. This lift station is a duplex submersible with one of two pumps working. Wastewater is collected in a circular 10-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 6-inch line. There is no fence, lock, or fall protection at the lift station. There is also no air release on the discharge line, flow meter, discharge pressure gauge, portable generator connection, or on-site generator. There is, however, a chemical odor control system that was not in use.

During the site visit, it was observed that pump 2 was nonfunctional. Bad corrosion throughout the site was also reported.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 was tested for approximately 70 seconds. Pump 2 was reported as dead and therefore not tested. Calculated pumping rates for the first pump was 658 gpm.

Big Smoky Lift Station Summary

Pump Station	
Location	12983 Patty Dr.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	10’ dia
Number of Pumps (working)	1 of 2
Pump Manufacturer	ABS
Pump, hp	58
Pump Test Results (pump 1, pump 2), gpm	658, X
Discharge Line Size, in	6”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, N, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	Not in use
Comments	Bad corrosion

P-5 REX/MORNING

The Rex/Morning Lift Station is located in the central area on Morning Dr., serving the Morning Dawn #4 subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence, lock, or fall protection at the lift station. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, on-site generator, or portable generator connection.

During the site visit, it was observed that pump 1 was air locked and does not pump well. There may be a removal problem due to the sensor placement. The safety hatch on the wet well was broken and there were cracks inside the wet well. There is also no liner.

Pump Test Results:

A pump test was completed on July 22, 2021. Both pumps were tested for approximately one minute each. Calculated pumping rates for pump 1 and pump 2 were 36 and 61 gpm, respectively.

Rex/Morning Lift Station Summary

Pump Station	
Location	12845 Morning Dr.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.7
Pump Test Results (pump 1, pump 2), gpm	36, 61
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, N, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Wet well cracks, no liner, wet well safety latch broken, pump 1 air locked

P-6 WW LAKE X-ING

The WW Lake X-ing Lift Station is located in the central area on Hereford Rd., serving the Wagon Wheel Ranch #1 subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 10-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence, lock, or fall protection at the lift station. There is also no air release on the discharge line, flow meter, discharge pressure gauge, or on-site generator. There is, however, an odor control system with chemical tank onsite that is not in use.

During the site visit, it was observed that the wet well latch was broken.

Pump Test Results:

A pump test was completed on July 22, 2021. Both pumps were tested for approximately one minute each. Calculated pumping rates for pump 1 and pump 2 were 399 and 411 gpm, respectively.

WW Lake X-ing Lift Station Summary

Pump Station	
Location	12860 Hereford Rd
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	10’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	9.4
Pump Test Results (pump 1, pump 2), gpm	399, 411
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, N, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	Yes
Comments	Wet well latch broken, chemical tank at pump station not in use

P-7 DAY/WAGON

The Day/Wagon Lift Station is located in the central area on Hereford Rd., serving the Boulder Point Campground. This lift station is a duplex submersible with one of two working pumps. Wastewater is collected in a circular 10-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 6-inch line. There is no fence, lock, or fall protection at the lift station. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, on-site generator, or portable generator connection.

During the site visit, it was observed that pump 2 was nonfunctional. The wet well vent also needs replacing. There is no cap on the camlock and the drain was plugged.

Pump Test Results:

A pump test was completed on July 23, 2021. Pump 1 was tested for approximately 90 seconds. Pump 2 was reported as dead and therefore not tested. Calculated pumping rate for the first pump was 219 gpm.

Day/Wagon Lift Station Summary

Pump Station	
Location	12741 Hereford Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	10' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	5.4
Pump Test Results (pump 1, pump 2), gpm	219, X
Discharge Line Size, in	6"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, N, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Replace wet well vent, pump 2 dead, no camlock cap, drain plugged

P-8 PEBBLE BEACH

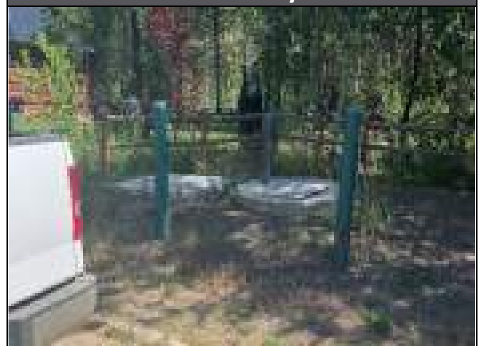
The Pebble Beach Lift Station is located in the southcentral area on Hereford Rd., serving the Pebble Beach subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there are locks on hatches. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, on-site generator, or portable generator connection.

During the site visit, it was observed that the vault handle is broken and the drain plugged.

Pump Test Results:

A pump test was completed on July 23, 2021. Both pumps were tested for approximately 50 seconds each. Calculated pumping rates for the pump 1 and pump 2 were 183 and 176 gpm, respectively.

Pebble Beach Lift Station Summary



Pump Station	
Location	12615 Hereford Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.7
Pump Test Results (pump 1, pump 2), gpm	183, 176
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Vault handle broken, drain plugged

P-9 CAMAS

The Camas Lift Station is located in the central eastern area on Camas Ln., serving the Wagon Wheel #4 subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there are locks on hatches. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, on-site generator, or portable generator connection.

During the site visit, it was observed that there are broken check valves, the wet well hatch blocks the control panel, and there was waste in the valve vault.

Pump Test Results:

A pump test was completed on July 23, 2021. Both pumps were tested for approximately 30 seconds each. Calculated pumping rates for pump 1 and pump 2 were 239 and 347 gpm, respectively.

Camas Lift Station Summary

Pump Station	
Location	149 Camas Ln.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.7
Pump Test Results (pump 1, pump 2), gpm	239, 347
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Broken check valves

P-10 MTN. SHADOWS

The Mtn. Shadows Lift Station is located in the southeastern area on Shadows Trail, serving the Mtn. Shadows #2 subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there is a lock on the vault. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, on-site generator, or portable generator connection.

During the site visit, it was observed that the vault drain is plugged, valves are submerged, and the wet well hatch blocks the electrical panel. The location has also been described as having poor space/access, as the lift station is located adjacent to the roadway.

Pump Test Results:

A pump test was completed on July 23, 2021. Both pumps were tested for approximately one minute each. Calculated pumping rates for pump 1 and pump 2 were 67 and 200 gpm, respectively.

Mtn. Shadows Lift Station Summary

Pump Station	
Location	204 Shadows Trail
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.7
Pump Test Results (pump 1, pump 2), gpm	67, 200
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Vault drain plugged, submerged valves, poor space/access

P-11 ARROWHEAD

The Arrowhead Lift Station is located in the southern area at the intersection of Lee Way and Homer Ln., serving the Arrowhead Point subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there is a lock on the vault and panel. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch.

During the site visit, it was observed that there is no camlock cap, hatch does not appear load rated, and a snake infestation.

Pump Test Results:

A pump test was completed on July 23, 2021. Both pumps were tested for approximately 40 seconds each. Calculated pumping rates for pump 1 and pump 2 were 157 and 115 gpm, respectively.

Arrowhead Lift Station Summary

Pump Station	
Location	Lee Way at Homer Ln.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.7
Pump Test Results (pump 1, pump 2), gpm	157, 115
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	No camlock cap, hatch not load rated, snakes

P-12 DAY STAR (DS) LAKE X-ING

The DS Lake X-ing Lift Station is located in the southeastern area at the intersection of E. Shadows Trail and the Railroad right-of-way (ROW), serving the Mtn. Shadows #1 subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 6-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is a chemical tank odor control system that is not in use. There is no fence or fall protection at the lift station but there is a lock on the panel. There is are also no air release on the discharge line, flow meter, discharge pressure gauge, on-site generator, or portable generator connection.

During the site visit, it was observed that there is a delayed signal with the ultrasonic level sensor causing inaccurate readings.

Pump Test Results:

A pump test was completed on July 23, 2021. Both pumps were tested for approximately one minute each. Calculated pumping rates for pump 1 and pump 2 were both 186 gpm.

Day Star Lake X-ing Lift Station Summary

Pump Station	
Location	E. Shadows Trail/ Railroad ROW
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	6' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	6
Pump Test Results (pump 1, pump 2), gpm	186, 186
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Chem tank not used, phase converter, delayed signal to ultrasonic sensor

P-13 LAKE FOREST

The Lake Forest Lift Station is located in the northeastern area on Forest Lake Circle, serving the Lake Cascade Forest subdivision. This lift station is a duplex submersible with one of two working pumps at the time of visit. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there is a lock on the hatches. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch.

During the site visit, it was reported that pump 1 was to be pulled the following week after the site visit. Observation saw the vault drain plugged, the ultrasonic level sensor was supported only by a cord, and infiltration was present.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 was to be removed and therefore was not tested. Pump 2 was tested for approximately 78 seconds. Calculated pumping rates for pump 2 was 81 gpm.

Lake Forest Lift Station Summary

Pump Station	
Location	90 Forest Lake Circle
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.7
Pump Test Results (pump 1, pump 2), gpm	X, 81
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Pump 1 removed, drain plugged, ultrasonic sensor hung by cord, I/I

P-14 MTN. MEADOWS

The Mtn. Meadows Lift Station is located in the northcentral area on Cameron Dr., serving the W. Mtn. Estates subdivision. This lift station is a duplex submersible with one of two working pumps at the time of visit. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence at the lift station but there are some locks and fall protection was available but not connected. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, on-site generator, or portable generator connection.

During the site visit, it was observed that available fall protection was not hooked/connected and the site has poor access.

Pump Test Results:

A pump test was completed on July 22, 2021. Both pumps were tested for approximately 80 seconds each. Calculated pumping rates for pump 1 and pump 2 were 82 and 69 gpm, respectively.

Mtn. Meadows Lift Station Summary

Pump Station	
Location	13122 Cameron Dr.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	6.7
Pump Test Results (pump 1, pump 2), gpm	82, 69
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	N/A
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, Y
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Fall protection not connected, poor site access

P-15 FM CHURCH CAMP

The FM Church Camp Lift Station is located in the northeastern area on Roseberry Rd., serving the Lake Cascade Ranch subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence at the lift station but there are locks and hooks for fall protection with no netting. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch.

During the site visit, it was observed that there is a pressure gauge installed at the bypass, no check valve on the vault drain, insulation has fallen off/deteriorated off the lid, there are hooks for fall protection but no netting, and pump 2 is underperforming.

Pump Test Results:

A pump test was completed on July 22, 2021. Both pumps were tested for approximately 140 seconds each. Calculated pumping rates for pump 1 and pump 2 were 62 and 31 gpm, respectively.

FM Church Camp Lift Station Summary

Pump Station	
Location	1723 W. Roseberry Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	4.7
Pump Test Results (pump 1, pump 2), gpm	62, 31
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Pressure gauge @ bypass, no check on drain, insulation deteriorated, no fall protection, pump 2 underperforming

P-16 RR VILLAGE (SPRING VALLEY)

The RR Village Lift Station, also known as Spring Valley, is located in the eastern area on Spring Valley Rd., serving the Railroad Village subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but locks were present. There is also no air release on the discharge line, flow meter, discharge pressure gauge, odor control system, on-site generator, or portable generator connection.

During the site visit, it was observed that the vault drain was plugged, 4x4 wood pipe support needs replacing, penetration holes are not grouted, and the site is located in a driveway.

Pump Test Results:
A site visit was completed on July 23, 2021. No pump test was performed.

RR Village Lift Station Summary

Pump Station	
Location	13122 Cameron Dr.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	2.4
Pump Test Results (pump 1, pump 2), gpm	No pump test
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	N
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	N
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Drain plugged, 4x4 wood pipe support, holes not grouted, located in driveway

P-17 FIR GROVE

The Fir Grove Lift Station is located in the central eastern area on Durham Ln., serving the Fir Grove and Boulder Creek subdivisions. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 8-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 6-inch line. There is no fence or fall protection at the lift station but there are locks. There is also no air release on the discharge line, flow meter, discharge pressure gauge, or on-site generator. There is, however, a portable generator connection with a manual transfer switch and odor control system.

During the site visit, it was observed that penetrations are not grouted, level read-out needs to be replaced, lots of debris in the vault, and weeds on site.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 was tested for one minute and pump 2 was tested for two minutes. Calculated pumping rates for pump 1 and pump 2 were 401 and 213 gpm, respectively.

Fir Grove Lift Station Summary

Pump Station	
Location	Durham Ln.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	8' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.8
Pump Test Results (pump 1, pump 2), gpm	401, 213
Discharge Line Size, in	6"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	Yes
Comments	Penetration not grouted, replace level read-out, debris, weeds

P-18 JACK'S LOOP

The Jack's Loop Lift Station is located in the central eastern area on Jack's Loop, serving the Whistlers Cove, WW 6, 7, and 8, and the Pointe at Goldenfork subdivisions. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there are locks. There is also no air release on the discharge line, flow meter, discharge pressure gauge, or on-site generator. There is, however, a portable generator connection with a manual transfer switch and odor control system.

During the site visit, it was observed that the level controller needs to be replaced and the vault drain was plugged, causing water and debris to build up.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 was tested for 75 seconds and pump 2 was tested for 117 seconds. Calculated pumping rates for pump 1 and pump 2 were 124 and 82 gpm, respectively.

Jack's Loop Lift Station Summary

Pump Station	
Location	182 Jack's Loop
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	2.4
Pump Test Results (pump 1, pump 2), gpm	124, 82
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	Yes
Comments	Replace level controllers, vault drain plugged

P-19 THE RESERVE

The Reserve is the southernmost lift station, located on Kantola Rd. and Lee Way, serving the Reserve at Lake Cascade and Camarie Cove subdivisions. This lift station is a duplex submersible with only one pump connected. There is no conduit for the second pump to be put into service. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there are locks on everything. There is also no air release on the discharge line, flow meter, discharge pressure gauge, or on-site generator. There is, however, a portable generator connection with a manual transfer switch and odor control system.

During the site visit, it was observed that there is no penetration grout, septic trucks sink in the sand due to the softness of the site's ground, there is no conduit for the second pump to be in service, the pipeline material is PVC, the vault drain was plugged, there was no inflow, sewage was leaking in the vault, and the site floods each spring.

Pump Test Results:

A pump test was completed on July 23, 2021. Pump 1 is the only pump in service and was tested for 175 seconds. The calculated pumping rate for pump 1 was 75 gpm.

The Reserve Lift Station Summary

Pump Station	
Location	Kantola Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5' dia
Number of Pumps (working)	1 of 2
Pump Manufacturer	ABS
Pump, hp	2.4
Pump Test Results (pump 1, pump 2), gpm	75, X
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	Yes
Comments	No penetration grout, soft site, septic trucks sink in sand, no conduit for second pump, PVC line, vault drain plugged, no inflow, sewage leaking in vault, site floods

P-20 HAWKS BAY

The Hawks Bay Lift Station is located in the northwestern area by the intersection of Hawks Bay Rd. and Tamarack Falls Rd., serving the Hawks Bay subdivision. This lift station is a triplex submersible with two out of three working pumps. Pump 2 was not installed at the time of visit. It was noted that there is one big pump (pump 1) sized incorrectly, and one jockey pump (pump 3). Wastewater is collected in a circular 8-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there are locks. There is also no air release on the discharge line, flow meter, auto dialer or SCADA system (though there is a panel for connection). There is, however, an on-site 60 kW generator for standby power with an automatic transfer switch, a portable generator connection, discharge pressure gauge, bypass pump provisions, and a carbon odor control system.

During the site visit, it was observed that the floor drain was plugged, air releases are needed, pipes and supports are rusted, there is one big pump (pump 1) not sized correctly and one jockey pump (pump 3), pump 2 was not installed, and the electrical panel rocks back and forth and is sitting on a concrete slab on the ground.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 was tested for 168 seconds. Pump 2 was not installed. Pump 3 (jockey pump) was tested for 125 seconds. Calculated pumping rates for pump 1 and pump 3 were 67 and 90 gpm, respectively.

Hawks Bay Lift Station Summary

Pump Station	
Location	Hawks Bay Rd. & Tamarack Falls Rd.
Lift Station Type	Triplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	8' dia
Number of Pumps (working)	2 of 3
Pump Manufacturer	ABS
Pump, hp	10.7, 6.2 (jockey)
Pump Test Results (pump 1, pump 2, jockey), gpm	67, X, 90
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	Y
Transfer Switch (Y/N)	Y, Automatic
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	Y
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	None
Odor Control System	Yes, carbon
Comments	Floor drain plugged, need air releases, rusty pipes and supports, incorrect pump size, pump 2 not installed, panel rocks

P-21 MEADOWS (WEST MTN.)

The Meadows Lift Station, also known as West Mtn., is located in the northcentral area on Norwood Rd., serving the Meadows at West Mtn. subdivision. This lift station is a triplex submersible with two out of three working pumps. Pumps 1 (installed 2019) and 2 are ABS PIR-PE80 pumps, and pump 3 is a jockey pump that was not working at the time of visit. Wastewater is collected in a circular 8-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there are locks. There is also no air release on the discharge line, flow meter, or odor control system. There is, however, an on-site 40 kW generator for standby power with an automatic transfer switch, a portable generator connection, discharge pressure gauge, and bypass pump provisions.

During the site visit, it was observed that there are no mixer rails, two pumps are employed during runoff season, pump 1 was installed in 2019, a bird's nest and other debris were present, the ceiling needs to be painted, control wires were exposed, larger pressure gauges are needed, and the lift station is **not** owned by North Lake.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 was tested for 60 seconds and pump 2 was tested for 45 seconds. Pump 3 (jockey pump) was not tested. Calculated pumping rates for pump 1 and pump 2 were 200 and 263 gpm, respectively.

Meadows Lift Station Summary

Pump Station	
Location	13097 Norwood Rd.
Lift Station Type	Triplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	8' dia
Number of Pumps (working)	2 of 3
Pump Manufacturer	ABS
Pump, hp	10.7, 4.7 (jockey)
Pump Test Results (pump 1, pump 2, jockey), gpm	200, 263, X
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	Y
Transfer Switch (Y/N)	Y, Automatic
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	Y
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	No mixer rails, 2 pumps during runoff, has hose bibb, ceiling needs paint, control wires exposed, need larger pressure gauges, NLRSWD does not own

P-25 POISON CREEK

The Poison Creek Lift Station is located in the southwestern area on W. Mountain Rd., serving the Tamarack Resort. This lift station is a duplex submersible. Wastewater is collected in a circular 12-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through dual, parallel 4-inch and 10-inch lines. There is no fall protection at the lift station but there are locks and a wooden fence providing very low security. There are air releases on the discharge lines, flow meter, and odor control system that is not used. There is also an on-site 250 kW generator for standby power with an automatic transfer switch, discharge pressure gauge, and bypass pump provisions.

During the site visit, it was observed that the wood fence provides low security, the generator building needs siding, the submersible level sensor and transducer needs to be replaced, the discharge pressure gauge may also need replacing, there was buildup in the wet well, and overflow connects to a lined pond.

Pump Test Results:

A pump test was completed on July 22, 2021. The flow meter reported output for pump 1 and pump 2 to be 1,000 and 870 gpm, respectively.

Poison Creek Lift Station Summary

Pump Station	
Location	2035 W. Mountain Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	12’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	70
Pump Test Results (pump 1, pump 2, jockey), gpm	1000, 870
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	Y
Level Control Type	Submersible
Flow Meter (Y/N)	Y
On-Site Generator (Y/N)	Y
Transfer Switch (Y/N)	Y, Automatic
Portable Generator Connection (Y/N)	N
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	Y
Fence, Lock, Fall Protection (Y/N)	Y, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	Yes
Comments	Wood fence, building needs siding, transducer needed, overflow connects to lined pond

P-26 TAMARACK (UPPER, DISCOVERY DRIVE)

The Tamarack Lift Station, also known as Upper and Discovery Drive, is located in the southwestern area on Discovery Dr., serving the Tamarack Resort PH-1 Discovery Estates. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is recorded via an ultrasonic level sensor before being pumped and discharged through a 4-inch line. There is no fence or fall protection at the lift station but there are locks. There is also no air release on the discharge line, flow meter, discharge pressure gauge, or on-site generator. There is, however, a portable generator connection with a manual transfer switch and charcoal bed odor control system with a fan.

During the site visit, it was observed that pump 2 was struggling and the power meter reads “error”.

Pump Test Results:

A site visit was completed on July 22, 2021. No pump test was performed.

Tamarack Lift Station Summary

Pump Station	
Location	620 Discovery Dr.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	4.7
Pump Test Results (pump 1, pump 2), gpm	No pump test
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Ultrasonic
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, Y, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	Yes
Comments	Pump 2 struggling, power meter reads “error”

P-27 STEELHEAD

The Steelhead Lift Station is located in the southwestern area on Steelhead Ct., serving the Tamarack Resort PH-2 Clearwater and Staircase Chalets and Estates. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 5-foot diameter wet well. Level is normally recorded via a submersible sensor before being pumped and discharged through a 4-inch line, but the sensor was not working properly at the time of visit. There is no fence, fall protection, or locks, meaning there are no security measures in place at the site. There is also no air release on the discharge line, flow meter, discharge pressure gauge, or on-site generator. There is, however, a portable generator connection with a manual transfer switch and an Orenco carbon odor control system.

During the site visit, it was observed that the submersible level sensor was not working properly, there are infiltration and inflow (I/I) issues, the valve vault was unable to be accessed, wet well was not lined, there was no site water, and the site did not appear to have seal offs to the pumps. In winter months, access to the site is also limited.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 was tested for approximately 105 seconds and pump 2 was tested for approximately one minute. Calculated pumping rates for pump 1 and pump 2 were 92 and 163 gpm, respectively.

Steelhead Lift Station Summary

Pump Station	
Location	28 Steelhead Ct.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	5’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	6.7
Pump Test Results (pump 1, pump 2), gpm	92, 163
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	N/A
Discharge Pressure Gauge (Y/N)	N
Fence, Lock, Fall Protection (Y/N)	N, N, N
Alarm Telemetry Type	Auto Dialer
Odor Control System	Yes
Comments	Level sensor not working, I/I issues, inaccessible valve vault, not lined, no site water, no pump seal offs

P-35 BUTTERCUP

The Buttercup Lift Station is located in the southwestern area on W. Mountain Rd., serving the Royal Scot #2, 5, and 6 subdivisions. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 6-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence, but locks and fall protection are in place. There is also no air release on the discharge line, flow meter, working discharge pressure gauge, odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch.

During the site visit, it was observed that the discharge pressure gauge was not working, rodents inhabiting in/around lift station, insulation was on the vault lid, and infiltration and inflow (I/I) issues are present.

Pump Test Results:

A pump test was completed on July 22, 2021. Both pumps were tested for approximately one minute. Calculated pumping rates for pump 1 and pump 2 were both 193 gpm.

Buttercup Lift Station Summary

Pump Station	
Location	2160 W. Mountain Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	6' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	3.8
Pump Test Results (pump 1, pump 2), gpm	193, 193
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	Y (not working)
Fence, Lock, Fall Protection (Y/N)	N, Y, Y
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Pressure gauge not working, insulation on vault lid, appears to be I/I flow, rodents

P-36 LITTLE

The Little Lift Station is located in the southwestern area on W. Mountain Rd., serving the Royal Scot #1 subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 6-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or locks, but fall protection is in place. There is also no air release on the discharge line, flow meter, odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch and a discharge pressure gauge.

During the site visit, it was observed that there is infiltration and inflow (I/I) issues, the valve vault was flooded and valves were submerged and damaged, a fence is needed at the site, the wet well was lined, insulation was on the vault lid, and site layout/access was poor.

It was also noted that the controls should be checked. Both pumps were on with the water level at 3.8 feet.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 was tested for approximately one minute and pump 2 was tested for approximately 72 seconds. Calculated pumping rates for pump 1 and pump 2 were 200 and 171 gpm, respectively.

Little Lift Station Summary

Pump Station	
Location	2212 W. Mountain Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	6’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	6.7
Pump Test Results (pump 1, pump 2), gpm	200, 171
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	Y
Fence, Lock, Fall Protection (Y/N)	N, N, Y
Alarm Telemetry Type	Auto Dialer
Odor Control System	Yes
Comments	I/I, valve vault flooded w/submerged valves, no fence, wet well lined, poor access

P-37 GRASMICK

The Grasmick Lift Station is located in the west central area on W. Mountain Rd., serving the Royal Scot subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 8-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or locks, but fall protection is in place. There is also no odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch, a discharge pressure gauge, air release on the discharge line, and a flow meter.

During the site visit, it was observed that the mixer does not work, there is limited site parking, there is a rusted pipe, and the air release drains into the vault and needs to be relocated.

Pump Test Results:

A pump test was completed on July 22, 2021. The flow meter reported output for pump 1 and pump 2 to both be 135 gpm. When both pumps were tested together, the flow meter reported a combined flow of 263 gpm.

Grasmick Lift Station Summary

Pump Station	
Location	2303 W. Mountain Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	8' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	16.8
Pump Test Results (pump 1, pump 2), gpm	135, 135
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	Y
Level Control Type	Submersible
Flow Meter (Y/N)	Y
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	Y
Fence, Lock, Fall Protection (Y/N)	N, N, Y
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Mixer doesn't work, limited parking, pipe rusted, air release drains to vault

P-38 SMILING JULIE

The Smiling Julie Lift Station is located in the northwestern area on W. Mountain Rd., serving the Smiling Julie subdivision. This lift station is a duplex submersible with two working pumps. Wastewater is collected in a circular 8-foot diameter wet well. Level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or locks, but fall protection is in place. There is also no air release on the discharge line, flow meter, odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch, and a discharge pressure gauge.

During the site visit, it was observed that the mixer does not work, there was a buildup of solids in the wet well, and the discharge lines needs an air release.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 and pump 2 were both tested for approximately 100 seconds. Calculated pumping rates for pump 1 and pump 2 were 119 and 114 gpm, respectively.

Smiling Julie Lift Station Summary

Pump Station	
Location	2455 W. Mountain Rd.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	8' dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	13.4
Pump Test Results (pump 1, pump 2), gpm	119, 114
Discharge Line Size, in	4"
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible, backup floats
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	Y
Fence, Lock, Fall Protection (Y/N)	N, N, Y
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Mixer not working, builds up solids, needs air release

P-40 WESTWOODS

The Westwoods Lift Station is located in the northwestern area on Westwood Dr., serving the Westwood #1 and 2 subdivisions. This lift station is a duplex submersible. Pump 1 is on order. Wastewater is collected in a circular 6-foot diameter wet well. The level is recorded via a submersible sensor before being pumped and discharged through a 4-inch line. There is no fence or locks, but fall protection is in place. There is also no air release on the discharge line, flow meter, odor control system, or on-site generator. There is, however, a portable generator connection with a manual transfer switch, and a discharge pressure gauge.

During the site visit, it was observed that there was solids buildup in the wet well and the pressure gauge range is too large.

Pump Test Results:

A pump test was completed on July 22, 2021. Pump 1 is on order. Pump 2 was tested for approximately 90 seconds. The calculated pumping rate for pump 2 was 70 gpm.

Westwoods Lift Station Summary

Pump Station	
Location	2502 Westwood Dr.
Lift Station Type	Duplex, submersible
Wet Well Dimensions (LxWxD / Dia.), ft	6’ dia
Number of Pumps (working)	2 of 2
Pump Manufacturer	ABS
Pump, hp	6.7
Pump Test Results (pump 1, pump 2), gpm	X, 70
Discharge Line Size, in	4”
Air Release on Discharge Line (Y/N)	N
Level Control Type	Submersible
Flow Meter (Y/N)	N
On-Site Generator (Y/N)	N
Transfer Switch (Y/N)	Y, Manual
Portable Generator Connection (Y/N)	Y
Bypass Piping (Y/N)	Y
Discharge Pressure Gauge (Y/N)	Y
Fence, Lock, Fall Protection (Y/N)	N, N, Y
Alarm Telemetry Type	Auto Dialer
Odor Control System	No
Comments	Solids buildup, pump 1 on order, lined wet well, no fence, no locks, pressure gauge range too large

2.4.1. Pipeline Age

The NLRSWD GIS database included pipeline installation date. According to this data, the system has pipes that were installed as early as 1997. The GIS installation data appears to have been updated as the NLRSWD performed replacement and rehabilitation efforts. A breakdown of the pipeline age by installation year is shown in TABLE 2-2 in Appendix B shows the locations of pipelines by age.

TABLE 2-2: PIPELINE AGE

Year Installed	Age[1] (years)	Length (ft)	% of Total
1997	26	133,128	44.6%
1998	25	21,087	7.1%
1999	24	18,123	6.1%
2004	19	8,290	2.8%
2006	17	17,819	6.0%
2007	16	4,981	1.7%
2008	15	8,859	3.0%
2009	14	3,864	1.3%
Unknown	-	82,657	27.7%
Total	-	298,808	100.0%

1) Pipeline age calculated from year of Master Plan Update, 2023

Typically, sanitary sewer pipelines have an expected service life of 50 to 80 years. The longer a pipe remains in the ground, the more likely the pipe is to experience cracks, root intrusion, breaks, and such defects that increase I/I into the system. As such, the oldest pipelines as well as known problematic areas should be the highest priority to CCTV inspect. Around 28% of pipeline age is unknown. It is recommended that the unknown age of pipelines attempt to be assessed through other records, such as building permits, plat approvals, etc. Pipelines of unknown installation date represent an unknown risk to the system and have the potential to be past their service life.

2.4.2. Pipeline Material

The GIS database includes pipeline material data. Pipeline material within the NLRSWD consists of polyvinyl chloride (PVC) and ductile iron pipe (DIP). Around 27% of pipeline material is unknown. It is recommended the District continue to update their GIS database as they perform pipeline repair and rehabilitation efforts, as well as CCTV inspection TABLE 2-3 provides a full breakdown of pipelines by diameter and material. Figure 2-2 in Appendix B shows the locations of pipelines by material.

TABLE 2-3: PIPELINE SIZE AND MATERIAL (ALL LENGTHS IN FEET)

		Material				
		PVC	DIP	Unknown	Total	% of Total
Size	2"	706	0	0	706	0.2%
	4"	16,016	9,310	0	25,326	8.5%
	8"	177,919	0	2,700	180,619	60.4%
	10"	12,300	0	0	12,300	4.1%
	Unknown	0	0	79,857	79,857	26.7%
	Total	206,941	9,310	82,557	298,808	100.0%
	% of Total	69.3%	3.1%	27.6%	100.0%	

CHAPTER 3 - COLLECTION SYSTEM PERFORMANCE

The section below summarizes the wastewater collection system model development process and existing 20-year, and buildout collection system analysis. It outlines the model construction and model calibration process, and documents existing hydraulic deficiencies. Improvements to address these deficiencies are presented in Chapter 7.

3.1. MODEL CONSTRUCTION

InfoSWMM Suite v14.7 was selected as the modeling software for this project. InfoSWMM is a fully dynamic model that operates in conjunction with Esri ArcGIS and allows for evaluation of complex hydraulic flow patterns.

As part of this study, Keller Associates surveyed 1,049 manholes rim elevations and 19 lift stations within the District's collection system. The survey was performed using the NAD83 vertical datum. These survey points were brought into GIS and were used for rim elevations in model construction. In addition, the District provided Keller with record drawings of their infrastructure to inform pipe and manhole inverts. In areas where the provided record drawings used a different datum than the survey, the surveyed rims were used and inverts adjusted to reflect record drawing manhole depths. The entire system was modeled, with the exception of some small lift stations and pipelines and the pipelines upstream of the Poison Creek lift station, which were excluded from the scope of this study. Modeled pipelines are shown in Figure 3-1 in Appendix B.

After all manholes and pipelines were created and elevation data populated in the model, several queries were conducted to reveal data anomalies. The data anomalies discovered included pipelines with reverse slopes or adverse grades, unusual changes in pipe size, and uncommon configurations in the pipe network. Anomalies that were discovered were compared to record drawings, discussed with District personnel where appropriate, and the appropriate changes were made to the model. It should be noted that the minor RR Village, Discovery Drive, and City Field lift stations were not included in the construction of the model. Additionally, it was assumed that the dual forcemains that pump from the Poison Creek lift station to the WWTP have regular interties and each station that feeds into this shared forcemain has the ability to pump to both lines.

The District provided Keller with the total number of EDUs the sewer system currently serves, and the number of EDUs the District has committed to serve in planned developments. The District maintains a map of existing and planned developments, which was used to locate each of the developments.

Model loads refer to the wastewater flows that enter the sewer collection system. These loads are comprised of wastewater collected from individual services (base flows), plus groundwater infiltration and stormwater inflows (I/I). As part of the planning criteria established in Chapter 1 of this report, average and maximum day loading was established per capita, which was used to create a loading per EDU. This information along with subdivisions lot information was used to distribute loading within the District. The loads for each subdivision were distributed evenly across the subdivisions' manholes. The preliminary max day loading was applied to the model to create an existing max day scenario, and were subsequently adjusted during calibration.

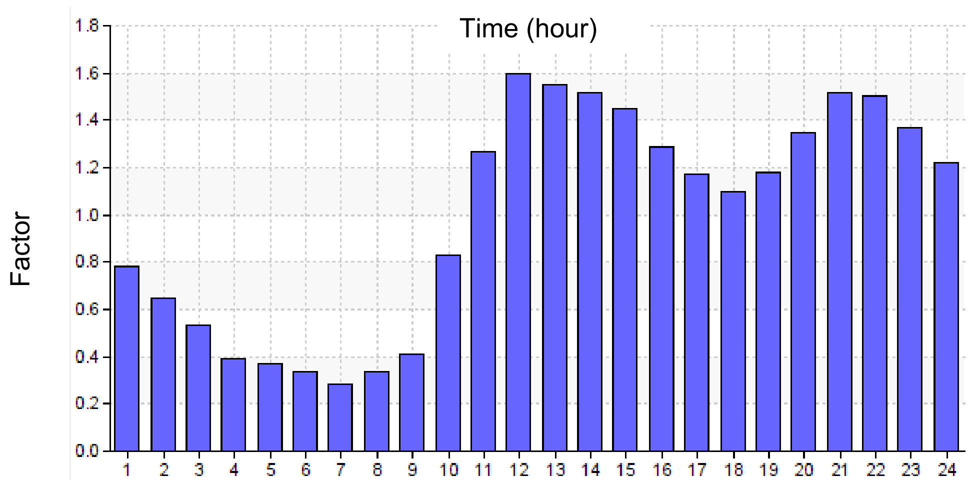
It is important to note that one of the basic assumptions of the hydraulic model is that all pipelines are free from physical obstructions such as roots and accumulated debris. Such maintenance issues, which certainly exist, must be discovered and addressed through consistent maintenance efforts. The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

3.2. MODEL CALIBRATION

The scope of this planning effort did not include supplemental flow monitoring. Additionally, because the District's wastewater treatment plant is served by lift stations and does not maintain hourly influent flow, a unique 24-hour flow pattern (diurnal curve) was not available for the District, so Keller Associates utilized flow monitoring performed for another client to establish a typical diurnal curve. The utilized curve is shown below in Figure 3-1. There were several reasons this curve was utilized:

- Taken from an Idaho community, with focus on residential uses, which reflects a similar makeup of the majority of the District's users.
- The pattern used reflects a similar pattern to what is presented as standard curves in written textbooks (Metcalf & Eddy, 4th Ed., Ch. 3).
- The peaking factor is 1.6, which is slightly more conservative than the assumed planning criteria peak of 1.5.

FIGURE 3-1: MODELED DIURNAL CURVE



After developing the curve, it was applied to all loads within the District to simulate daily flows, and the 24-hour model was run.

The District primarily utilizes lift stations to convey wastewater throughout the system. In order to calibrate the model, Keller Associates analyzed available pump runtime data starting in 2019. The period in April of 2019, where the system experienced flows around 1.72 MGD, produced the largest pump runtimes within the period examined. The runtimes of the model were compared to observed runtimes for this peak period, the results of which are shown in in Table 3-1 below. Through an iterative process, the loads upstream of each lift station were globally multiplied by factors until the runtimes of the model were generally within 15% of the observed peak runtimes. The cumulative factor applied to the loads upstream of each lift station are also shown in Table 3-1

TABLE 3-1: RUNTIME COMPARISON AND CALIBRATION FACTORS APPLIED

Name	Observed Combined Pumps Max Day (minutes)	Initial Model Runtime (minutes)	Net Factor Applied to Upstream Basin	Calibrated Model Runtime (minutes)
P-1 Hillhouse	167	113	1.31	163
P-2 Ponderosa	224	1743	1.00	224
P-3 - Margot	21	270	0.06	22
P-4 Big Smoky	437	972	0.25	771
P-5 Rex / Morning	213	1151	0.22	181
P-6 WW Lake X-ing	594	1665	0.29	908
P-7 Day / Wagon	876	1927	0.34	928
P-8 Pebble Beach	148	210	0.70	152
P-9 Camas	119	130	0.91	121
P-10 Mtn Shadows	571	1037	0.18	767
P-11 Arrowhead	922	921	1.00	918
P-12 DS Lake X-sing	618	928	0.53	681
P-13 Lake Forest	247	472	0.52	258
P-14 Mtn Meadows	855	2036	0.83	817
P-15 FM Church Camp	328	638	1.69	342
P-17 Fir Grove	424	264	1.60	411
P-18 Jacks Loop	500	561	0.89	509
P-19 The Reserve	57	26	1.00	27
P-20 Hawks Bay	538	468	1.70	551
P-21 Meadows / West Mountain	868	731	1.54	869
P-25 Poison Creek	660	316	2.09	661
P-35 Buttercup	51	261	0.15	56
P-36 Little Lane	295	349	0.54	328
P-37 Grasmick	391	483	3.58	398
P-38 Smiling Julie	153	382	0.28	165
P-40 Westwoods	85	217	0.39	89

As shown, P-4 Big Smoky, P-6 WW Lake X-ing, P-10 Mountain Shadows, and P-19 The Reserve all exceed 15% difference in runtime. P-4, P-7, and P-10 are all lift stations that are influenced by multiple lift stations upstream of their respective basins. After applying significant factors to decrease the flow in each basin (>70% reduction), it was determined that altering the factors directly upstream of the lift station would not produce enough reduction to match the observed runtimes. As such, for these portions of the system, the model is considered to be conservative capturing observed worse case conditions experienced from upstream basins. To increase model accuracy, additional SCADA data and flow monitoring is recommended.

The total model output was then compared to the planning criteria for max day loading. The model produces 1.80 MGD, compared to the planning criteria target max day flow of 1.91 MGD. It should be noted that flows produced by the City of Donnelly were not included in the model, which accounts for approximately 0.15 MGD of flow. Because the planning criteria included flow from Donnelly, the model is slightly conservative, and considered calibrated for max day.

3.3. COLLECTION SYSTEM EVALUATION CRITERIA

Keller Associates used the following planning criteria to evaluate the existing collection system:

- Depth over diameter (d/D): For gravity pipelines within the system, a good indicator of pipeline capacity is the maximum flow depth as it relates to the pipeline, or depth over diameter (d/D). For interceptor pipelines, if the d/D of a pipeline exceeds 0.75 during peak hour flow conditions, a pipe upsize project should be considered.
- Surcharging: Surcharging refers to when the water level in a manhole rises above the top invert of the ingoing or outgoing pipe. If surcharging is occurring, it is usually indicative of insufficient pipe capacity downstream. As a rule of thumb, no surcharging should be occurring in gravity sewer pipelines.
- Lift station firm capacity: Firm capacity refers to a lift station's pumping capacity with its largest pump offline. The lift station firm capacity should be capable of handling peak hour flows into the lift station. This ensures that the lift station has redundancy and can handle peak flows in the event of a pump failure. In duplex systems, a station exceeds its firm capacity if both pumps must run to convey flows into the lift station. The same applies to a triplex lift station if all three of its pumps are required to run.
- Maximum velocities in forcemains: In forcemains, it is important to keep velocities less than 10 fps. Exceeding this velocity means that headlosses can become very large, reducing the efficiency and capacity of the pump station. Additionally, high velocities can cause water hammering when valves open or close, which can cause damage to infrastructure. A high forcemain velocity is generally indicative of an undersized forcemain or an oversized pump. For longer forcemains, maximum velocities of 5 to 7 fps may be preferred to minimize headloss and long-term pumping costs.

3.4. CURRENT CAPACITY LIMITATIONS

The model was used to assess the effects of the existing and future max day flows on the existing system. Figure 3-2 in Appendix B illustrates the potential surcharging sites and gravity pipe capacity limitations identified by the model analysis during the existing system peak hour flow model scenario. The figure is color-coded to show a gradation of pipes based on utilized capacity, represented by depth of flow over diameter of the pipe (d/D) (e.g., red = flowing at >100% capacity, orange = flowing at 85-99% of d/D, yellow = flowing at 75-84% d/D, etc.). When assessing pipeline capacity, a pipe was assumed to be undersized when the d/D exceeded 0.75. The pipelines and manholes shown in red experience surcharging and represent the greatest risk for backing up services and possible overflow sites. Because undersized pump stations can create "upstream" surcharging and mask "downstream" concerns, the model was exercised using "Ideal" pumps (where all flow in is pumped out at the same rate), so the capacity of the gravity pipelines could be assessed absent of bottlenecks caused by undersized lift stations.

As shown in Figure 3-2, the system experiences surcharging in the 10-inch trunkline upstream of P-4 Big Smoky lift station. Additionally, small portions of the 10-inch trunkline upstream of P-6 WW Lake Crossing and P-7 Day/Wagon experience a d/D ratio of greater than 0.75, without surcharging the pipe. Surcharging in the system can lead to buildup of solids within laterals and increased risk of flooding and public health concerns. It should be noted that flows in these areas were considered to be conservative (i.e. higher than observed conditions) during model calibration efforts, suggesting that there still may be some additional capacity. Keller Associates recommends that additional flow monitoring be completed in these areas of concern to better assess remaining capacity and timing of future improvements. However, as shown in the future system evaluations, the existing system bottlenecks only become increasingly at risk with higher "upstream" flows coming from new developments. Alternatives to address this deficiency is presented in Chapter 7.

The remainder of the gravity lines appear to have enough capacity to handle existing flows.

Additionally, the pump stations and forcemains were checked for capacity issues. First, the pump stations' firm capacities were checked versus their peak modeled inflows to assess the stations' ability to convey flow. Second, the pressure mains' peak velocities were checked to assess if they were adequately sized for the stations' flows. The pump station capacity analysis can be found in Table 3-2, and the forcemain velocity analysis can be found in Table 3-3, both of which are included at the end of the chapter and include analysis of the two additional scenarios presented in Sections 3.5 and 3.6.

As shown in Table 3-1, several of the pump stations experience peak inflows higher than their respective firm capacities. These include P-6 Lake Crossing, P-7 Day/Wagon, P-10 Mountain Shadows, P-14 Mountain Meadows, and P-15 Church Camp. As such, these pumps are considered undersized to handle existing day flows. It is recommended that the District continue to monitor runtimes and perform flow monitoring to determine the need for short-term upgrades at these stations. SCADA trending of pump on/off status will be particularly important in confirming if all the lift station pumps are being called on at any given time.

For the forcemain analysis, it should be noted that the Poison Creek forcemain, which starts and the Tamarack Ski Resort and pumps through dual 10-inch forcemains, has many other lift stations flowing into it. As such, the velocity in Table 3-3 for the Poison Creek lift station is representative of its entire length of the forcemain, while the individual station numbers that pump into the shared forcemain with Poison Creek only represent their individual tributary forcemains prior to tying into the dual forcemains. Additionally, all modeling efforts assumed that both 10-inch forcemains were operable and had regular interties. The results presented in Table 3-2 represent the model output at each station. In the event that the lift station pumps were not capable of pumping the peak influent flow rate, the table represents maximum velocities within the forcemain assuming the peak inflow at the station was pumped through the station.

As shown in Table 3-3, none of the forcemains exceed a velocity of 10 feet per second, indicating adequate sizing for their pumps. The Poison Creek forcemain produces velocities in excess of 6 fps after it interties with the Big Smoky forcemain, but is considered acceptable for existing conditions.

3.5. COMMITTED DEVELOPMENT CAPACITY LIMITATIONS

The District provided Keller Associates with a list of developments throughout the study area where the District had annexed in developments and committed to provide service. Using this information and the planning criteria, Keller developed loads for the undeveloped portions of these developments and incorporated them into the model. It should be noted that the number of EDUs the District has committed to serving exceed the planning criteria for 20-year growth; the committed plus existing EDUs equal 7,211 EDUs (or 20,075 people) and the planning criteria lists 5,122 EDUs (or 14,238 people) as the 20-year projection. However, given the existing commitments, Keller Associates recommended completing this analysis in addition to the build-out analysis. Figure 3-3 in Appendix B shows the locations of the EDUs the District has committed to service. It should be noted that this figure does not depict the additional buildout of EDUs the District is committed to serve in existing subdivisions.

The capacity of the gravity pipelines in the system is shown in Figure 3-4 in Appendix B. The issues displayed in the existing system are exacerbated in the committed model, with the trunklines upstream of P-6 WW Lake Crossing, and P-7 Day/Wagon now surcharging. Alternatives to address these deficiencies are presented in Chapter 7 of this report.

Additionally, a review of the lift station shows that ten additional stations have incoming peak flows higher than their firm capacities. These include P-2 Ponderosa, P-4 Big Smoky, P-5 Rex/Morning, P-11 Arrowhead, P-12 DS Lake Crossing, P-17 Fir Grove, P-18 Jacks Loop, P-20 Hawks Bay, P-25 Poison Creek, and P-38 Smiling Julie. Upgrades to each of these stations and those identified in the existing system evaluation are recommended prior to buildout of their respective committed upstream developments.

For all lift stations, when the time comes to replace these pumps, it is recommended that the pumps installed be capable of a larger capacity so anticipated future flows do not exceed firm capacity. Keller further recommends that the SCADA system be upgraded to monitor and report lift station runtimes and flow data where available. Once lift station pump runtimes exceed approximately 10 hours per day (on max day), additional evaluation/monitoring may be warranted.

As shown in Table 3-3, the Poison Creek forcemain experiences velocities of greater than 10 fps, and thus is considered undersized downstream of the Big Smoky forcemain intersection. All other lengths prior to the intersection do not have velocities above 9 fps. Undersized forcemains can lead to an excess of head and power usage for the system's lift stations. Alternatives to address forcemain deficiencies are presented in Chapter 7.

3.6. BUILDOUT(50-YEAR) DEVELOPMENT CAPACITY LIMITATIONS

Keller Associates utilized the planning criteria and growth projections to calculate loads for the 50-year planning horizon (growth projection of 38,821 people to be serviced by the District). The incremental additional loads from the "committed" scenario to build-out was split into 4 areas, which are depicted in Figure 3-5 in Appendix B. Due to the topology of the District, some areas within the study area cannot be serviced by smaller gravity pipelines, and were assumed to be serviced by lift stations, which is also displayed in the figure.

The gravity system was analyzed, and the results are displayed in Figure 3-6 in Appendix B. As shown, the same problem pipeline displayed in committed scenario analysis has its issues exacerbated in the future system analysis. Additionally, the trunkline upstream of the Mountain Meadows station is considered undersized to handle buildout flows. Downstream trunklines that are undersized result in surcharging of many laterals that feed the trunklines.

Table 3-2 displays that two additional lift stations, P-19 The Reserve and P-13 Lake Forest, are also under capacity at buildout if buildout flows occur upstream of the lift stations. The capacity issues with the remainder of the lift stations experienced under the committed EDU peak inflow scenario are exacerbated at buildout peak inflow. Table 3-3 shows that the Poison Creek forcemain velocities increase and the pipe is undersized for buildout. Additionally, the P-14 Mountain Meadows lift station forcemain is undersized for buildout flows, as its velocity exceeds 10 fps. Velocities in the P-4 Big Smoky, P-6 Lake Crossing, and P-9 Camas forcemains exceed 8 fps, and should be monitored for increasing velocities as the system continues to build-out.

TABLE 3-2: LIFT STATION CAPACITY ANALYSIS

Lift Station	Firm Capacity (gpm)	Existing System Peak Inflow (gpm)	Committed Peak Inflow (gpm)	Buildout Peak Inflow (gpm)
P-1 Hillhouse	167	80	135	135
P-2 Ponderosa	222	170	365	540
P-3 - Margot	148	5	15	75
P-4 Big Smokey	658	520	1,100	1,490
P-5 Rex / Morning	36	15	90	90
P-6 WW Lake X-ing	399	475	920	1,300
P-7 Day / Wagon	219	290	560	860
P-8 Pebble Beach	176	20	30	30
P-9 Camas	239	40	70	70
P-10 Mtn Shadows	67	85	155	285
P-11 Arrowhead	115	75	115	180
P-12 DS Lake X-sing	186	100	195	390
P-13 Lake Forest	81	25	55	115
P-14 Mtn Meadows	69	100	330	500
P-15 FM Church Camp	31	35	215	275
P-17 Fir Grove	213	165	300	390
P-18 Jacks Loop	82	65	90	90
P-19 The Reserve	75	10	20	85
P-20 Hawks Bay*	130	75	240	300
P-21 Meadows / West Mountain	200	125	165	165
P-25 Poison Creek*	1,740	940	2,570	2,570
P-35 Buttercup	193	10	55	55
P-36 Little Lane	171	20	70	70
P-37 Grasmick	135	60	90	90
P-38 Smiling Julie	114	25	140	140
P-40 Westwoods	70	10	40	40

**Lift station is a triplex system. Firm capacity represents two pumps operating.*

TABLE 3-3: FORCEMAIN CAPACITY ANALYSIS

Lift Station	Existing System Peak Velocity (fps)	Committed Peak Velocity (fps)	Buildout Peak Velocity (fps)
P-1 Hillhouse	3.3	3.5	3.5
P-2 Ponderosa	6.6	6.6	6.6
P-3 - Margot	4.1	4.1	4.1
P-4 Big Smokey	5.8	7.0	9.5
P-5 Rex / Morning	2.1	2.3	2.3
P-6 WW Lake X-ing	3.7	5.9	8.3
P-7 Day / Wagon	3.0	4.5	6.3
P-8 Pebble Beach	4.2	4.2	4.2
P-9 Camas	8.5	8.4	8.2
P-10 Mtn Shadows	3.7	4.1	7.3
P-11 Arrowhead	3.3	3.7	5.4
P-12 DS Lake X-sing	3.6	4.3	5.7
P-13 Lake Forest	3.1	3.1	3.2
P-14 Mtn Meadows	3.0	8.4	11.7
P-15 FM Church Camp	3.6	5.5	6.9
P-17 Fir Grove	5.1	5.1	5.6
P-18 Jacks Loop	3.5	3.5	3.5
P-19 The Reserve	2.6	2.6	2.6
P-20 Hawks Bay	3.4	5.8	5.6
P-21 Meadows / West Mountain	3.2	4.2	4.2
P-25 Poison Creek	6.5	13.5	14.5
P-35 Buttercup	1.0	3.2	2.9
P-36 Little Lane	0.3	1.1	1.0
P-37 Grasmick	0.6	1.2	1.1
P-38 Smiling Julie	0.6	3.6	3.6
P-40 Westwoods	3.3	3.1	3.1

CHAPTER 4 - TREATMENT SYSTEM CONDITIONS

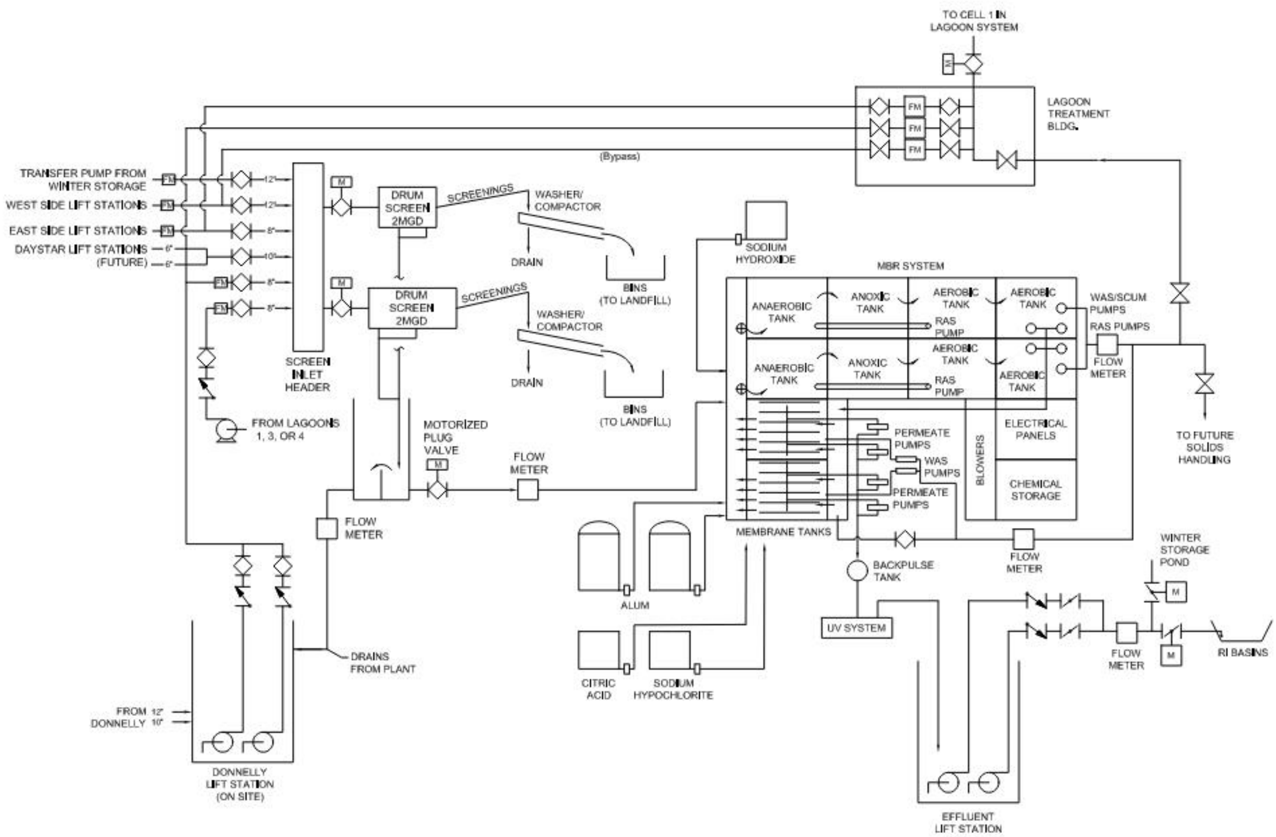
4.1. TREATMENT SYSTEM DESCRIPTION

The NLRSWD WWTP consists of two wastewater treatment systems: the lagoon system and the MBR system. The lagoon system includes two aerated treatments and one polishing treatment lagoons, two storage lagoons, and gas chlorination. The MBR treatment system includes headworks with influent screens and an MBR building housing the biological process basins and membrane treatment process. Biosolids from the MBR facility are pumped to the lagoon system for treatment and storage. Septage is also received and pumped to the lagoons. An aerial view of the WWTP is shown in figure 4-1.

FIGURE 4-1: WWTP AERIAL VIEW

A flow diagram for the MBR treatment system is shown in figure 4-2. Influent flow is screened in the headworks, and then flows to the MBR Building. The MBR treatment system includes a series of anaerobic, anoxic, and aerobic tanks followed by the membrane tanks. If the effluent is to be pumped to the RI basins, aluminum sulfate (alum) can be added upstream of the membrane tanks for additional phosphorus removal. Effluent (permeate) pumped from the membranes can be disinfected in an enclosed ultraviolet (UV) disinfection system or can go into Lagoon 5 and be disinfected with chlorine prior to being land applied. The alum dosing system and the UV disinfection system are not frequently used.

FIGURE 4-2: MBR WWTP PROCESS FLOW SCHEMATIC



4.2. WWTP CONDITIONS

4.2.1. Headworks

The headworks include influent flow monitoring, screening, influent sampling, and a splitter box. There is a flowmeter on each of the influent lines entering the Headworks Building. In addition, a flowmeter manhole west of the Headworks Building contains a magnetic flowmeter that continuously monitors the total screened flow routed to the MBR Building. The flow rate measured in this manhole is used to control the recycle rate within the MBR system, the permeate pumps, and the alum dosing pumps (when used). Continued maintenance of the flow meter is required to keep the meter calibrated. The vault that holds the flow meter can sometimes be full of water which needs to be removed.

Fine screening is required to protect the membranes in the MBR treatment. The original two screens experienced corrosion and frequently broke down. Two new 1-millimeter (mm) drum screens were installed this year and are shown in figure 4-3. One of the original screens was removed to make room for the new screens. The other original screen remains in place for redundancy. The original screens had a separate screening washer/compactor. In the new screens, the washing/compaction takes place within the screen unit. The washed and dewatered screenings are placed into a bagging system for disposal.

FIGURE 4-3: HEADWORKS DRUM SCREENS

Following the screens, the wastewater is piped to the splitter box. The splitter box provides flow splitting to the current and future MBR trains. An automatic refrigerated sampler located in the electrical room collects samples of influent wastewater from the splitter box. The headworks building has experienced extreme corrosion. Improvements to the HVAC system in the headworks would help ensure the equipment continues to last.

4.2.2. Septage Receiving

A septage receiving station is located near the lagoons, shown in figure 4-4. The station was installed in 2021 and the septage that exits the station is sent to Lagoon Cell 1. Since the station was installed approximately 1 million gallons (MG) of septage has received treatment at the plant.

FIGURE 4-4: SEPTAGE RECEIVING STATION

4.2.3. MBR Treatment

The MBR treatment process consists of a mixed liquor suspended growth biological reactor integrated with an ultrafiltration membrane system. The membranes are submerged in direct contact with the mixed liquor. Permeate pumps pull treated water through the membranes, and the solids remain in the MBR basins. In addition to housing the membrane tanks, the MBR Building houses process and membrane blowers, permeate pumps, UV disinfection equipment, effluent pumps, chemical dosing systems for phosphorus removal and membrane cleaning, return active sludge (RAS) pumps, waste activated sludge (WAS) pumps, scum pumps, and electrical power and control systems. figure 4-5 shows the inside of the MBR building, overlooking the process basins.

FIGURE 4-5: MBR TREATMENT BUILDING

The MBR treatment process consists of two treatment trains, each with an anaerobic tank, anoxic tank, and two aerobic tanks in series. The anaerobic and anoxic tanks serve as bioselectors to promote growth of specific types of microorganisms. Both the anaerobic and anoxic process tanks are equipped with submersible mixers for mixing the tank contents. Each mixer has an access port for removal of the mixer for maintenance, using a portable jib hoist crane. The bioselectors and aeration basins in each treatment train are instrumental in achieving the treatment goals. Mixed liquor is pumped to the membrane tanks by the RAS pumps and then sent back to the anaerobic tanks by gravity to keep the mixed liquor in the system.

A slide gate between the first aeration tank in each train allows for a hydraulic connection between the two trains to equalize the water depths in the two trains if both trains are used. This gate should be exercised to ensure the gate seals when needed. Each aerobic tank is equipped with a fine bubble diffuser system, which introduces compressed air from the process blowers into the bottom of the aeration basins. The purpose of the diffusers is to provide both mixing and oxygen transfer for aerobic treatment. The diffusers have not been inspected recently, which should occur annually.

Three positive displacement process blowers are utilized in a two duty and one standby configuration. The blowers are rated at a maximum output of 800 standard cubic feet per minute (SCFM) at 10.0 pounds per square inch gauge (psig). The blowers are each equipped with 100 horsepower (HP) motors. All blowers are housed in acoustic enclosures. Variable frequency drives (VFDs) are used to control airflow from the blowers by modulating the operating speed of the blower. The VFDs are controlled by a programmable logic controller (PLC-1). The PLC is also programmed to monitor the dissolved oxygen (DO) concentrations in the aerobic tanks and to adjust the blower speed to maintain a set point DO in the tanks. There is currently a resonance issue with one of the blowers when the blower is operating at low (~59-65%) and high (~97%) rates. Additional investigation of this issue was outside of the scope of the planning study. The simplest solution may be to program this blower to avoid operating at these speeds. The blowers will be nearing their expected life span during the 20-year period, and different blowers may save electricity.

Each train is equipped with two RAS pumps to lift flow up into the membrane tank distribution channel. The pumps are rail-mounted submersible pumps with VFDs to control the pump flow. Each pump is designed to deliver up to approximately 1,700 gpm. The membrane distribution channel splits the flow to the MBR basins that contain the membranes.

The membranes are submerged in the MBR basins, in direct contact with the mixed liquor. The membrane system is the Zenon ZeeWeed© system, which has cartridges consisting of a polymer membrane cast on the outside surface of a porous support fiber (average porosity 0.04 microns). Zenon is currently owned by Veolia. Hundreds of these hollow fibers are contained within bundles called a module. Modules are grouped together within cassettes. There are eight cassettes with room for four additional cassettes. All but two of the membrane cassettes have been replaced once. figure 4-6 shows a permeate pump and lines from the MBR basins.

FIGURE 4-6: MBR PERMEATE PUMP

The membrane modules in each basin are connected by a permeate header to a permeate pump for that individual basin. The permeate pump applies a vacuum to the membrane modules, which causes the treated water to pass through the wall of the hollow fiber membrane into the header at the top of the cassette to be pumped out by the permeate pump. Solids are retained at the surface of the membrane fibers. To enhance sloughing of the solids from the surface of the fibers, an air diffuser located at the base of each membrane module continually agitates the membranes. The membranes are able to move slightly when aerated to enhance the solids removal. Additional cleaning is achieved by regular backpulses, which consists of pumping collected permeate in the reverse direction, from the inside of the hollow fibers to the outside. The manufacturer recommends pulling the cassettes once a year to determine if aeration is sufficient to avoid sludging. A cassette was pulled in October 2022 for inspection and the cassette was quite clean, indicating that the aeration has been sufficient.

In addition to air scouring and backpulsing, the membranes can also be chemically cleaned through maintenance and recovery cleaning. The membrane modules are typically cleaned in place, one tank at a time. The cleaning chemicals typically used are sodium hypochlorite (for removal of organic foulants), and citric acid (for removal of inorganic contaminants). Maintenance cleaning is automatically initiated by the MBR control system at an operator-set frequency. Recovery cleaning is also performed periodically which is a deeper chemical cleaning.

FIGURE 4-7: MBR BLOWERS

Air from the membrane blowers is piped to diffusers beneath the membranes in the MBR basins to scour the membranes and provide oxygen for the biological process. There are three air scour blowers, two duty and one standby. The blowers are shown in figure 4-7. Except during chemical cleaning and relax modes, one membrane blower operates at all times. The membrane blowers are positive displacement blowers rated at a maximum output of 1,450 SCFM at 5.1 psig. The blowers are each equipped with 75 HP motors.

Permeate pumps provide suction on the membrane cartridges to create trans-membrane pressure (TMP) that removes the water from the mixed liquor. The flux (filter flowrate per square foot of membrane area) is regulated using VFDs on the permeate pumps. Four rotary lobe pumps serve as the permeate pumps. One pump pulls permeate from the cassettes in each basin. Permeate from the four permeate pumps is combined in a header that transports the flow to the backpulse tank, which is maintained to provide sufficient clean water for the backpulse and recovery cleanings. The recovery cleanings can run into problems if the backpulse tank level is too low. Veolia recommends observing the water level in the backpulse tank and supplementing it if necessary to ensure the recovery clean has sufficient water. Permeate flow is measured by a magnetic flowmeter in the discharge line of each pump. The TMP is also monitored, using a pressure gauge and transmitter. An increase in TMP may indicate that membrane cleaning is needed. Two low-range turbidimeters are located on the permeate lines to monitor membrane performance over time.

Overflow from the backpulse tank can flow into the UV reactors. There are four stainless steel enclosed low pressure, high intensity UV reactor chambers, with 32 lamps per chamber. The chambers are connected in parallel, with two chambers considered as a train. The effluent can also bypass the UV system and go directly into the effluent pump sump.

The effluent lift station is shown in figure 4-8. Two vertical turbine pumps with VFDs convey effluent from the effluent sump to the winter storage lagoon (Lagoon 5). The pumps can also be used to convey the flow to the RI basins. The pumps have a rated capacity of 700 gpm. The operating speed of the pumps is controlled to maintain a set level in the effluent sump. The plant SCADA (Supervisory Control and Data Acquisition) system monitors flow, line pressure and effluent destination (RI basins or Lagoon 5). Two utility water system pumps also pull from the effluent sump. The utility water pumps have a capacity of 130 gpm.

FIGURE 4-8 EFFLUENT LIFT STATION

Chemicals that can be used in the process include alum (for phosphorus removal), sodium hydroxide (for pH control), sodium hypochlorite and citric acid (for membrane cleaning). The chemical storage area in the MBR Building houses two 2,500-gallon insulated tanks for alum, and the chemical feed pumps for alum, sodium hypochlorite and citric acid. Sodium hypochlorite and citric acid are provided in totes. The MBR control panel automatically controls the chemical feed pumps and solenoid valves for the sodium hypochlorite and citric acid to feed these chemicals as needed for both the maintenance clean and the recovery cleaning. The alum dosing system has not been used and is already 15 years old. figure 4-9 shows the totes in the chemical room.

FIGURE 4-9: CHEMICAL ROOM

Sludge wasting is necessary to maintain good biological treatment and membrane performance. Acceptable operating values for the mixed liquor concentration in the membrane process ranges from 5,000 to 15,000 mg/L; however, Veolia recommends a target value less than 10,000 mg/L mixed liquor suspended solids (MLSS) to maximize membrane performance. Sludge is wasted from the RAS return channel downstream of the MBR basins. Two constant speed immersible screw centrifugal pumps, installed in the basement of the MBR Building, provide duty/standby for sludge wasting. A WAS pump is shown in figure 4-10. These WAS pumps are controlled through the MBR control panel, by the operator entering the volume of sludge to be wasted and when wasting is to begin. The PLC starts the pump at the designated time and runs it until the specified volume is wasted. Currently, the waste sludge is pumped to the lagoons. Two constant speed submersible scum pumps are installed in the scum pit adjacent to the aerobic basins in the MBR Building. Pump operation is controlled from the level in the scum box.

FIGURE 4-10: MBR WAS PUMP

Standby electrical power for the MBR treatment is provided by a 1,000-kW generator in the generator room of the MBR Building as shown in figure 4-11. In the event of a power outage, an automatic transfer switch switches the entire load for the plant to the generator. The load is automatically switched back to the grid when power is restored.

There are three main control systems for the MBR Building: the MBR control panel, a SCADA system, and the programmable logic controller (PLC) for the UV disinfection system. The control system provided by Zenon for the MBR system controls the operation of the entire MBR process. The plant SCADA computer is a laptop that can be operated from various locations. The plant SCADA system directly controls the headworks, scum pumps, effluent pumps and utility water system. The UV disinfection system is controlled by the PLC provided by Trojan, the UV supplier. The SCADA system has not been upgraded since it was installed. It is also difficult for the existing SCADA system to archive data and provide it to the operators. Since the systems are original, it is more difficult to get replacement components.

FIGURE 4-11: MBR STANDBY GENERATOR

There is a large amount of equipment associated with an MBR system. Due to the long delay for some parts, a spare parts inventory is recommended. This could include permeate pumps, permeate transmitters, membrane tank level transmitters, aeration isolation valves, permeate isolation valves, and permeate flow meters. Currently, one RAS pump and one mixer are missing from the process trains.

The RI basins require compliance with total nitrogen and total phosphorus requirements. The District does not have an oxidation-reduction potential (ORP) probe to analyze if anaerobic and anoxic conditions are occurring in the basins, which would be helpful for targeting nitrogen and phosphorus removal. Purchasing a probe for routine checks would be beneficial. Additionally, the original design also included an additional recycle pump in the biological trains to move mixed liquor from the anoxic zone back to the anaerobic zone. This recycle pump would further support further biological nutrient removal.

The District does have a laboratory inside the MBR Building. Currently, samples are shipped out to other labs for analysis.

4.2.4. Lagoons

The lagoon treatment facility consists of two complete mix aerated lagoons, followed by one polishing lagoon. Lagoons 4 and 5 act as winter storage lagoons. A treatment building houses flow metering, four positive displacement blowers for the first two lagoons, chlorination disinfection equipment, and land application irrigation pumps. During the irrigation season, effluent is drawn from Lagoons 4 and 5 and disinfected prior to land application. The effluent is dosed with chlorine at the head end of the chlorine contact chamber (a 500-foot long 30-inch pipe) and pumped to the irrigation system. The lagoons have passed their previous seepage tests. Seepage testing was completed on Lagoons 4 and 5 in 2021. Seepage testing is scheduled for Lagoon 1 in 2025, and Lagoons 2 and 3 in 2026. Refer to table 4-1 for a summary of information about the lagoons. Lagoons 1-3 were originally used by the City of Donnelly. They are still owned by the City but are leased to the District. Lagoons 4 and 5 are owned by the District.

FIGURE 4-12: LAGOONS

TABLE 4-1: LAGOON SUMMARY

Lagoon Number	Description	Maximum Operating Volume (MG)	Surface Area (acres)	Year Seepage Test Performed	Liner Type
LG-070-01	Aerated, Complete Mix	3.50	1.00	2015	PVC with soil cover and rip rap on side slopes
LG-070-02	Aerated, Complete Mix	1.83	0.75	2016	PVC with soil cover and rip rap on side slopes
LG-070-03	Polishing	1.76	0.46	2016	PVC with soil cover and rip rap on side slopes
LG-070-04	Effluent Storage	10.97	2.39	2021	PVC with soil cover and rip rap on side slopes
LG-070-05	Effluent Storage	46.50	11.40	2021	PVC with soil cover and rip rap on side slopes; HDPE liner over PVC liner on vertical walls

There appears to be some diffusers in the lagoons that need to be replaced. Also, Lagoon 1 is nearing its solids holding capacity. Depending on the type of solids removal, a seepage test may be required following the removal. Also, a Solids Management Plan would be required. Duckweed has periodically been an issue at the lagoons, especially in the treatment and polishing lagoons. It can increase the need for solids removal and also cause issues with treatment and disinfection.

4.2.5. Disinfection

The primary method of disinfection at the plant is chlorination. Chlorine gas (99.5%) is added after Lagoons 4 and 5, prior to land application. Dosing is done via a Regal Model 210 chlorinator with a maximum capacity of 100 pound per day (ppd). According to plant staff, dosing during the irrigation season typically ranges from 40 to 70 ppd depending on flow and Total Coliform sampling results. The gas chlorine system is shown in figure 4-13.

Chlorine is added at the head of a 500-foot long 30-inch chlorine contact chamber. The volume of this chamber equates to 18,300 gallons. Therefore, the maximum flow in the chamber that can maintain a 15-minute contact time per Ten State Standards is 1,220 gallons per minute (gpm).

Chlorine gas is hazardous and poses a risk to operators. The District should ensure the gas cylinders are properly contained, leak alarms are working, and operators have proper protective equipment. The District may want to consider alternative disinfection methods, such as liquid chlorine, to ensure operator safety.

The only current method to disinfect the effluent to the RI basins is with UV. Since the UV system has not frequently been used and is already 15 years old, improvements may be needed to ensure long-term performance and permit compliance.

FIGURE 4-13: GAS CHLORINE SYSTEM

4.2.6. Land Application

There are two irrigation pumps in the Lagoon Blower Building to pump to the land application areas. Each pump has a capacity of 350 gpm. A magnetic flow meter is used to measure the pumping rate and total pumped volume for monitoring purposes. MU-07001 is a 104-acre grass hay field and timber field south of the WWTP owned by the Eld family. The field is sometimes planted with oats. MU-07002 is a 65-acre grass hay field north of the WWTP. The open fields are irrigated with wheel lines; however, a 66-acre portion of MU-07001 which has timber and grass pasture is irrigated with stationary handlines that are not moved. The permit only allows water to be land applied during the growing season from May 1 through October 15.figure 4-14 provides a map of the land application and RI basin sites.

FIGURE 4-14: LAND APPLICATION AND RI BASIN SITE MAP

4.2.7. RI Basins and Effluent Pipeline

High quality disinfected effluent can be pumped to the RI basins through a 3-½ mile long, 14-inch HDPE pipeline for disposal. The pipeline has four air release stations at high points in the line. At the bridge crossing, the pipe is reduced to 8 inches to meet clearance requirements, and the pipe (heat traced, insulated, and jacketed) is suspended under the bridge. The pipe is purple to indicate it is carrying reclaimed water, and valve boxes and above ground appurtenances are also marked in purple.

The RI basins are located north of Roseberry Road and east of Norwood Road on the Parks Ranch property. These facilities consist of shallow earthen basins, valves, and basin inlet and overflow structures. There are fourteen RI basins to provide dose/drain cycles, and to allow for routine maintenance. Ramps allow access into the basins for periodic disking of the surface crust, and to remove plants and other maintenance needs. The distribution line runs down the center of the access road between the west and east basins, and tees into each basin. Each basin inlet has a manual valve. The dikes between basins have a riprapped spillway to allow overflow if the water level exceeds 2 feet. One of the RI basins is shown in figure 4-15.

FIGURE 4-15: RAPID INFILTRATION BASIN

There are groundwater monitoring wells around the RI basins. These are referenced in and are to be monitored in accordance with the reuse permit (Appendix A). Suggested loading cycles for the RI basins are 1 to 3 days application followed by 4 to 5 days drying in the summer and 1 to 3 days application followed by 5 to 10 days drying in the winter. The RI basins have not been used extensively since they were built, although they were used during some maintenance activities at the WWTP and from March 2017 through June 2017 because of concerns the storage lagoons could overflow due to substantial snowmelt. The RI basins require maintenance to avoid growth of trees and other vegetation. Similarly, the valves require regular operation and some repair. The fence around the RI basins and the vegetation on the RI basins also require regular inspection and repair or removal.

4.3. FINANCIAL STATUS OF EXISTING FACILITIES

Financial information for the NLRSWD is provided in Appendix C for the year 2022. Operating revenue during the 2022 fiscal year was $1,859,975. This includes both sewer and water. Annual costs to operate and maintain the wastewater system, separated by type of expense, are also shown in Appendix C. Total operating expenses for the 2022 fiscal year was $1,790,300. Capital revenue for 2022 was $322,500.00.

4.4. WATER/ENERGY/WASTE AUDITS

No water, energy, or waste audits have been conducted by the District.

4.5. SYSTEM CLASSIFICATION

Both the Collection System and WWTP are classified as Class IV systems. Classifications are determined by the components of the system and the number of people they service. The recycled wastewater that is land applied is permitted as Class C. The permit requirements for the RI basins are outlined in Chapter 1.

CHAPTER 5 - TREATMENT SYSTEM PERFORMANCE

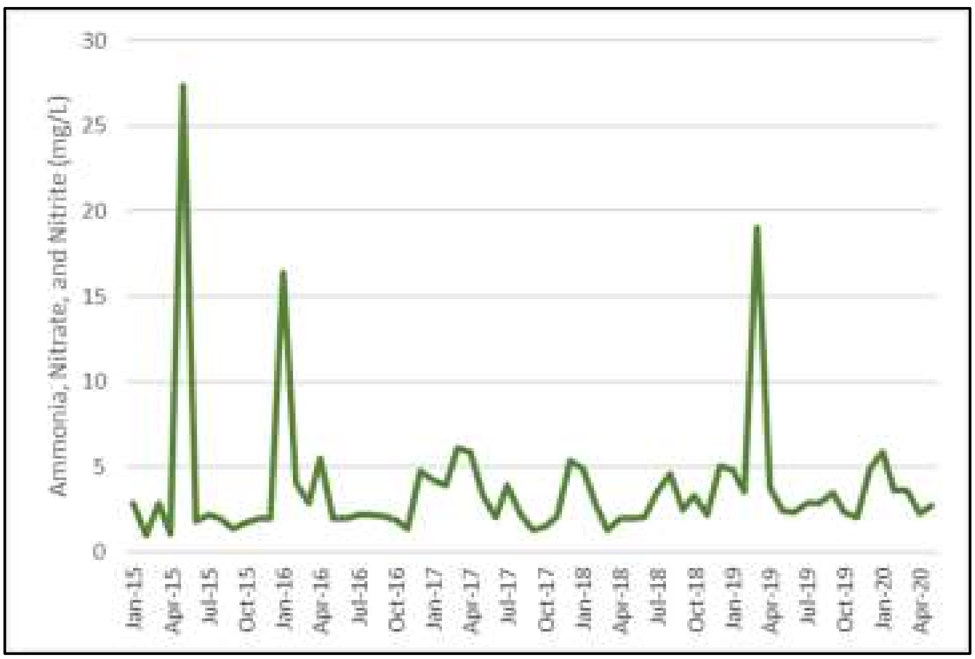
5.1. WWTP PERFORMANCE

This section discusses the effluent quality observed through sampling. The permit requires the effluent water to be applied to the land application sites not exceeding the maximum nitrogen and chemical oxygen demand (COD) loading rates. For the RI basins, the effluent needs to not exceed total nitrogen, total phosphorus, and TSS limits. Both the land application and RI basins have the same limits for total coliform organisms. Annual reports were completed in 2020 and 2021 that summarized these values. The District also monitors the MBR permeate through the SCADA system. A summary for the different constituents is provided below.

5.1.1. Total Nitrogen

As shown in Chapter 1, if the RI basins were used, the monthly average total nitrogen limit is 10 mg/L. Figure 5-1 shows the sum of the monthly average effluent ammonia, nitrate, and nitrite concentrations from January 2015 through May 2020. Although the organic nitrogen is not measured, if the organic nitrogen is less than 5 mg/L, it appears the effluent total nitrogen concentration would be less than the 10 mg/L limit with the exception of three events. The three events occurred during the early part of the year, and it is assumed that the storage lagoons could be used during future similar events if necessary.

FIGURE 5-1: EFFLUENT AMMONIA, NITRATE, AND NITRITE (MONTHLY AVERAGE)



The permit also includes a nitrogen loading for the land application system of 150% of the typical crop uptake. For 2022, a typical nitrogen uptake of 41.3 lb./acre was assumed for oats, 67 lb./acre for the grass pasture and timber area, and 59.2 lb./acre for the mixed pasture grass. The total nitrogen loading was below the permit limit even with some of the water coming out of the lagoon treatment system.

5.1.2. Total Phosphorus

Total phosphorus does not have a limit for the land application sites, but the RI basins have a maximum loading limit of 8.3 kg/month. The average concentration of total phosphorus in the wastewater effluent was between approximately 1 and 4 mg/L in the data provided (January 2015 through May 2020). At the current average flow (0.237 MGD), and assuming a concentration of 4 mg/L, the loading would be approximately 110 kg/month, which is much more than the maximum loading limit for the RI basins. It is likely that without additional treatment targeted for phosphorus removal, such as dosing alum or another coagulant ahead of the membranes, the WWTP will be unable to achieve compliance with the phosphorus limit.

5.1.3. Total Suspended Solids and Turbidity

There is a permit limit for TSS to the RI basins; however, the effluent TSS from the MBR has historically not been measured. Although not a permitted limit, the MBR system is designed to have very low turbidity, and turbidity can sometimes be used to approximate TSS levels. The MBR effluent turbidity values provided by the District (January 2015 through May 2020) were consistently under 0.2 Nephelometric Turbidity Units (NTU). Based on the turbidity values, it is anticipated that the effluent TSS to the RI basins would be in compliance with the TSS limit.

5.1.4. Chemical Oxygen Demand

The permit limits the maximum COD loading to the land application fields to 50 lb./acre-day. The COD loading has historically been well below this daily permit. The maximum estimated daily COD loading ranged from approximately 0.9 to 1.3 lb./acre-day in 2020, 1.54 to 2.87 lb./acre-day in 2021, and 1.71 to 2.84 lb./acre-day in 2022.

5.1.5. Coliform Organisms

The 5-day median total coliform limit set by the permit is 23 coliform organisms per 100 mL. The single sample limit is 230 coliforms per 100 mL. The effluent exceeded the 5-day median and single sample limit three times in 2020 at the beginning of the sampling period. The operators were able to adjust the dosing to maintain compliance through the rest of 2020 and 2021. Another event occurred in August 2022 when a plug on an abandoned line from Lagoon 1 to the chlorine contact chamber failed. The abandoned line was re-plugged and the chamber was jetted and cleaned. After these actions the effluent has been within permit limits. Sampling of the MBR effluent for coliform did not occur during this period as the effluent is normally sent to the land application areas.

5.2. WWTP CAPACITY

This section provides a summary of the capacity of the existing WWTP. The headworks facility, MBR treatment, lagoon treatment and storage, disinfection system, RI basin capacity, and land application are each addressed.

5.2.1. Headworks

The wastewater influent is combined in a common header and directed to one of the three fine screens. Each screen has a rated capacity of 2 MGD. The firm capacity of the headworks screening is 4 MGD (peak flow the headworks can handle with one screen out of service), which is much more than is needed for the 20-year planning period (1.46 MGD). An electromagnetic flowmeter measures the influent flow prior to the MBR Building. The 12-inch flowmeter has sufficient capacity for the planning period. The septage receiving station has a rated capacity of almost 1 MGD (650 gpm), which should be sufficient for receiving a truck at a time.

5.2.2. MBR Treatment

The manufacturer-rated treatment capacity of the MBR can be analyzed by comparing design values to projected loadings. TABLE 5-1 summarizes the design values compared to future loading projections. Future loadings are predicted to be beyond the design values. However, in discussions with Veolia, and based on calculations, it is likely that the plant can treat the 2042 loads. Additionally, as discussed in Chapter 1, these loadings are based on estimates rather than actual data. Further sampling may indicate lower loadings, which can delay the need for improvements.

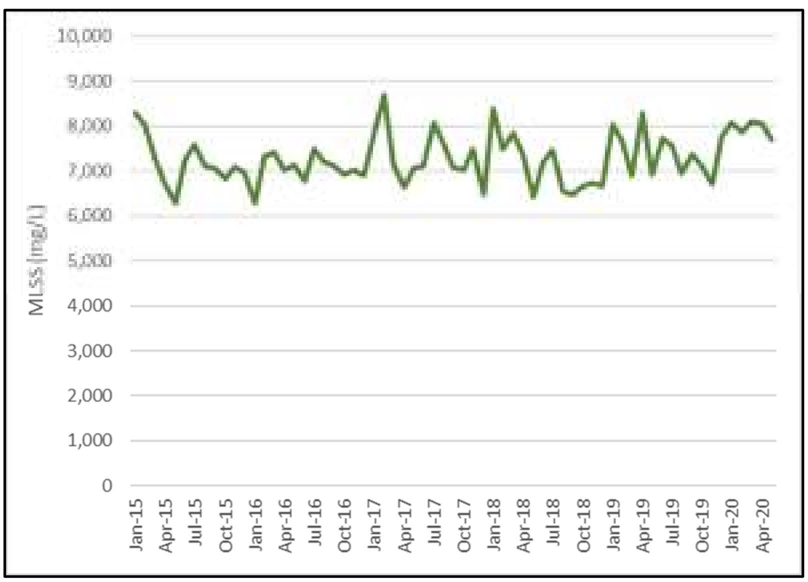
TABLE 5-1: DESIGN LOADING AND FUTURE PROJECTIONS

Element	Design Value	Current Value	2042 Value
Avg. Influent BOD_5 (ppd)	1,960	1,240	2,420
Avg. Influent TSS (ppd)	1,960	1,459	2,848
Avg. Influent Total Nitrogen (ppd)	480	263	427
Avg. Influent Total Phosphorus (ppd)	83	35	68

Biological treatment occurs in the anaerobic, anoxic, and aeration basins. Each anaerobic and anoxic train is designed to have a mixer to mix the tanks, although currently one mixer is missing. The process blowers are each rated for a maximum output of 800 SCFM. The firm capacity of the positive displacement blowers is 1,600 SCFM with one blower out of service. Based on the 2042 loads in Chapter 1, it is expected that the blowers may be approaching their capacity in the 20-year planning period. However, as discussed above, these loadings are estimates and further sampling may indicate lower loadings, which can delay the need for additional blower capacity.

One critical factor in the operation of an MBR process is the MLSS concentration. Normally, it is desirable to maintain a MLSS concentration between 5,000 mg/L – 15,000 mg/L. Higher mixed liquor concentrations can be used but additional air scour (resulting in increased energy cost) and increased wear and tear on the membrane are factors to consider. The concentrations also depend on the season. In the winter the desire is to carry a little more solids for operation. Veolia recommends a target value less than 10,000 mg/L to maximize membrane performance. The actual operating MLSS concentration has been fairly consistent throughout the years, with values between 6,000 and 8,000, which is in the acceptable range. A graph summarizing the monthly average MLSS concentrations January 2015 through May 2020 is shown in Figure 5-2.

FIGURE 5-2: MLSS CONCENTRATIONS (MONTHLY AVERAGE)



Each train is equipped with two RAS pumps to lift flow up into the membrane tank distribution channel. The design flow for each of the four existing RAS pumps is approximately 1,700 gpm at 8 feet of total dynamic head. Thus, the total maximum flow from the pump station is approximately 6,800 gpm (9.8 MGD). Normally, the mixed liquor flow from the aeration basins to the MBR basins is four to six times the influent flow to help avoid too high of MLSS concentrations in the MBR basins. The RAS pumping capacity is more than sufficient for the 20-year period. For example, with one pump in use, the RAS pumping would be greater than five times the ADF in 2042.

There are eight membrane cassettes with room for four additional cassettes in the MBR basins. The original installation included 46 modules in each cassette with 340 ft2 of effective membrane surface area per module (125,120 ft2 total surface area). Six of the eight cassettes now have 48 modules in each cassette and also the modules have greater effective surface area per module (370 ft2; 137,840 ft2 total surface area). TABLE 5-2 provides a summary of the projected flows compared to the manufacturer-rated membrane capacity. Veolia has not re-rated the membrane capacity of the installation due to temperature concerns. The current membrane capacity is sufficient for the 20-year planning period.

TABLE 5-2: PROJECTED FLOWS & MEMBRANE CAPACITY

Description	Design Membrane Capacity	Buildout Membrane Capacity	Current Flows	2032 Projected Flow	2042 Projected Flow
Average Day (MGD)	0.80	1.00	0.237	0.331	0.462
Maximum Month (MGD)	1.00	1.25	0.390	0.545	0.762
Peak Day (MGD)	2.00	2.50	0.497	0.695	0.971

The membrane blowers are rated at a maximum output of 1,450 SCFM. The blowers are each equipped with 75 HP motors. The blowers were designed to have sufficient capacity to provide air scouring for the buildout membranes.

Four (4) 20 HP permeate pumps with VFDs were designed to each handle approximately 215-430 gpm of permeate and 680 gpm at backpulse. However, in looking at the data sheet for the pumps, they may be limited to 130-340 gpm. Therefore, the maximum flow is 0.50 MGD for each pump or approximately 2.0 MGD total. With one pump out of service, the permeate pumping capacity is approximately equal to the 2042 projected peak hour flow.

Two (2) screw centrifugal pumps are used for WAS and for draining the tanks. The WAS pumps were designed for 1,100 gpm. Two (2) submersible non-clog pumps, with a capacity of 75 gpm are used to pump scum. The scum and WAS are pumped to the lagoons. The estimated waste sludge flow in 2042 is approximately 30,000 gallons per day, which is much less than the capacity of the WAS pumps. To provide better wasting control and to maintain better characteristics for dewatering equipment, a switch to positive displacement pumps for the WAS pumps is recommended. The existing WAS pumps could continue to remain in place for draining the tanks.

5.2.3. Lagoons and Land Application

The lagoon system functions as an alternative treatment train and storage for winter flows until the irrigation season. The lagoons can store approximately 64.5 MG or 198 acre-feet of water. A water balance was performed to determine if the storage capacity is sufficient through the planning period. For the water balance, the 2022 farming operations were utilized. In 2022, the 66-acre portion of MU-07001 had timber and grass pasture, the 38-acre portion of MU-07001 had oats, and the 43-acre MU-07002 had mixed pasture grass. As discussed in the 2022 Reuse Annual Report, the theoretical irrigation water requirement (IWR) for the mixed pasture grass on MU-07002 was estimated using net irrigation water requirement (Pdef) reported by the Evaporation and Consumptive Irrigation Water Requirements for Idaho (ET Idaho) published by the University of Idaho.

For MU-07001, ET Idaho does not have published IWR values for oats; therefore, an IWR of spring grain was assumed for the oats. Based on the water balance, the lagoons do not have enough volume to store the water through the planning period. In fact, the winter storage this year is currently insufficient and the District is planning to use the RI basins.

As shown in the 2022 Reuse Annual Report, the water application periodically exceeded the crop IWR. Also, supplemental water was not applied in 2022. This shows that the land application area is at capacity. The firm capacity of the irrigation pumps is 350 gpm (with one pump out of service). The current maximum pumping day is approximately 715 gpm, so the current pumps are approximately at their capacity, but there is no redundancy. A spare pump on the shelf would be helpful to avoid long lead time delays.

Lagoon 1 is used to store and treat wasted solids from the MBR facility. The lagoon is nearing its storage capacity, which has resulted in poor treatment throughout the rest of the lagoons. The District has noted that the effluent from the lagoon system struggles to be land applied due to the lack of treatment caused by the reduced volume in the lagoons. It is recommended to dredge and dispose of the solids in Lagoon 1 as soon as possible. Additionally, dredging the lagoon will allow the existing diffusers to be replaced.

5.2.4. Disinfection

The District uses the chlorine dosing system at the lagoons to disinfect the effluent prior to the irrigation system. The chlorine contact chamber is a 30-inch wide, approximately 500-feet long pipe. At the current maximum required pumping rate of 715 gpm, the contact time would be approximately 25 minutes. This contact time is greater than the recommended 15 minutes by Ten State Standards (Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environment Managers, 2014). The disinfection system is estimated to dose 7 mg/L or 70 ppd currently. As mentioned earlier in this chapter, the District has been able to achieve the required total coliform limit except during upset conditions mentioned previously. The disinfection system has a capacity of 100 ppd. If the land application area increases, the chlorine dosing and contact system may exceed its capacity.

The only current means of disinfection prior to the RI basins is with the UV system. The manufacturer-rated capacity of the UV system is 1,740 gpm (2.5 MGD). Although the capacity is sufficient for the 20-year planning period, since the UV system is already 15 years old and has not been frequently used, improvements may be needed to ensure long-term performance.

5.2.5. Rapid Infiltration

The RI basins are available to be used for effluent disposal year-round. There are 14 basins, totaling 9 acres. Assuming a maximum disposal rate of 0.2 ft3/ft2 per day, the allowable disposal rate would be approximately 0.59 MGD. The ADF in 2042 is 0.51 MGD, therefore, the RI basins would have capacity to handle the plant effluent without utilizing the land application system.

The effluent lift station following the MBR has two pumps, each with a capacity of 700 gpm. Therefore, the firm pumping capacity is approximately 700 gpm or 1 MGD, which should be sufficient for the 20-year planning period especially if the land application system is still in operation.

It is recommended that the effluent be rotated between each RI basins to limit the hydraulic loading rate. As the basins have not been used since they were built, it is first recommended that the basins be cleared of plants that may have grown. Improvements to the UV are recommended to ensure compliance with the total coliform limits. Also, chemical addition will need to be initiated at the MBR WWTP to reduce the phosphorus load to the RI basins.

CHAPTER 6 - NEED FOR SYSTEM IMPROVEMENTS

Concerns surrounding health, sanitation, security, aging infrastructure, and reasonable growth should be addressed to meet the needs of the system throughout the planning period. This chapter summarizes the deficiencies based on the existing facility evaluation.

6.1. HEALTH, SANITATION, AND SECURITY

Idaho's Recycled Water Rules (IDAPA 58.01.17) provides primary procedures and requirements for the issuance and maintenance of permits for reuse facilities. The recycled water must meet Class C requirements as noted in the District's Reuse Permit No. LA-000070-04. The permit specifies the required buffer zones, disinfection requirements, growing season hydraulic loading rates, and maximum nutrient loading rates. The reuse permit can be found in Appendix A. In addition, groundwater and soil constituents are monitored to evaluate potential impacts. The District generally has not experienced issues maintaining compliance with the permit requirements. The permit expired on December 20, 2015, but has been administratively extended.

Overflows are a public health and sanitation concern as they involve events when untreated or undertreated wastewater overflows onto the ground or is discharged to surface water. There have not been any overflows at the WWTP. The WWTP is surrounded by a fence to address security concerns. The land application areas and RI basins are also fenced with signs posted designating the areas.

6.2. AGING INFRASTRUCTURE

The District's MBR treatment facility began operating in 2008, but some of the other equipment in the system is older. Improvements are needed to update the equipment. The SCADA system has not been upgraded since 2008 and it is difficult to archive data and provide it to the operators. Similarly, the plant PLCs are a risk since they are no longer manufactured.

6.3. SYSTEM DEFICIENCIES

The system deficiencies discussed in previous chapters are summarized below:

<u>Collection System</u>

- Lack of pump redundancy at following pump stations:
- Big Smoky
- Rex/Morning
- Day/Wagon
- Hawks Bay
- The Reserve
- Ponderosa
- FM Church Camp
- Tamarack
- All or nearly all pump stations are lacking:
- Safety and security measures such as fencing, fall protection, and locks

- Flow meters
- Pressure gauges
- Air release valves
- SCADA connection
- Backup power is not available at 11 pump stations.
- WW Lake Crossing force main does not have adequate capacity to convey 20-year flows.

<u>WWTP Headworks</u>

- The WWTP lacks a dedicated grit removal system. The fine screen is the only solids removal process upstream of the MBR.
- The HVAC system needs to be improved to limit future corrosion in the headworks.

<u>MBR Treatment</u>

- There is a resonance issue for one of the process blowers at certain speeds.
- The process basins and blowers will be near capacity at the end of the 20-year planning period. However, additional influent loading data may indicate lower than projected loadings.
- The permeate pumps will be near their firm capacity at the end of the 20-year planning period. A spare pump could reduce the risk of a long lead time if a pump fails.
- Similarly, spare parts on other equipment would help avoid similar long lead time risks.
- Currently one RAS pump and one mixer are missing from the process basins.
- The WAS pumps are oversized, which makes it difficult to control the amount of WAS pumped. Replacement of these pumps could be part of a sludge dewatering project.
- An ORP probe and recycle pumps are recommended to monitor conditions in the process basins and assist with additional biological nutrient removal for discharge compliance at the RI basins.
- The blowers will be nearing their expected life span during the 20-year period. Rather than replacing the blowers with the same type, higher efficiency blowers are recommended.

<u>Biosolids</u>

- The biosolids are currently sent to Lagoon 1, which is at its solids storage capacity. This lagoon needs to be dredged to remove and dispose of the solids.
- A Biosolids Management Plan will be needed prior to disposing of the biosolids. Biosolids may require land fill disposal unless a biosolids treatment process is added in the future.

<u>Lagoons</u>

- The winter storage capacity in the lagoons is not sufficient. Without additional storage lagoons and land application area, the RI basins will need to be used for effluent disposal.
- The firm capacity for the irrigation pumps is not sufficient.
- Based on the aeration pattern there appears to be some lagoon diffusers that need to be replaced.

Disinfection

- Gas chlorine disinfection of the lagoon effluent is a safety hazard.
- If additional land application area is added and the irrigation pumps increase, the chlorine dosing and contact system may exceed its capacity.
- UV disinfection system is approximately 15 years old and needs to be upgraded during the planning period.

SCADA

- The SCADA system is outdated and presents difficulties archiving data.
- Similarly, the plant PLCs are reaching their expected life and should be updated.

Rapid Infiltration

- The RI basins require maintenance to avoid vegetation growth. Similarly, the valves for each basin require operation and some repair.
- Phosphorus removal needs to be enhanced prior to discharging to the RI basins and the dosing system updated.

6.4. REASONABLE GROWTH

Wastewater facility improvements are needed to stay ahead of population growth and new construction. Chapter 1 of this report discussed population growth projections including customers served, along with the wastewater flows associated with this growth. Additionally, the District will serve commitments to many developments and infrastructure needs to be maintained and/or upgraded to meet these commitments.

CHAPTER 7 - COLLECTION SYSTEM ALTERNATIVES

This chapter discusses project alternatives to correct the existing collection system deficiencies discussed in Chapter 3, and to prepare the system for future sewer loads. General capacity and condition upgrades are discussed along with specific alternatives that were explored in more detail with District staff. Where recommended improvements appeared relatively straightforward, no additional improvements were explored. Costs of recommended alternatives are included in the Capital Improvement Plan in Chapter 9 and individual project summary sheets are shown in Appendix E. Cost estimates for the major alternatives discussed are presented in Appendix G.

7.1. EXISTING DEFICIENCY CAPACITY ALTERNATIVES

As stated in Chapter 3 of this report, the gravity trunkline upstream of the Big Smoky lift station presents the primary capacity concern in the existing system. As pipelines approach their capacity, action must be taken to ensure that manhole surcharging and sanitary sewer overflows do not occur. The following subsection presents the alternatives for addressing capacity concerns. All of the alternatives evaluated take place along the same corridor; a visual representation is shown in Figure 7-1. Table 7-1 presents a comparison of benefits and drawbacks of each alternative. Prior to proceeding with either alternative, it is recommended that the District CCTV this section of pipe and install a temporary flow metering device to monitor actual flow.

7.1.1. Big Smoky Trunkline Alternatives

- Alternative 1: Increase the size of the existing trunkline

  The first alternative the District could pursue would be to increase the size, and thus the capacity, of the existing 10-inch gravity trunkline upstream of the Big Smoky lift station. To handle the future flows, the pipeline should be upsized to an 18-inch, which allows for conveyance of buildout flows and also provides a factor of safety for additional unexpected growth. This option utilizes existing right of ways.

- Alternative 2: Extend the existing 8-inch forcemain from the WW Lake Crossing Lift Station to Big Smoky Lift Station

  The second alternative considered was to extend the existing 8-inch WW Lake Crossing forcemain along the same corridor and have it discharge directly to the Big Smoky lift station. The primary advantage to this alternative is that pressure mains have smaller diameters, and can be constructed near the surface, meaning reduced excavation and material costs. Based on preliminary calculations, the extended length of the forcemain does not produce enough friction head to overcome the natural drop in elevation head that the pressure main would experience. As such, upsizing the WW Lake Crossing pumps may not be required as part of this alternative. That being said, this option also may lead to more complex pump station operation and the addition of several air release valves due to the pumps releasing at a lower elevation than the existing discharge. With the Big Smoky Lift Station flows diverted, the existing 10-inch trunkline has the capacity to take future and existing flows from the Rex Morning lift station and the existing connections along the trunkline, and will not require upsizing if this alternative is pursued.

FIGURE 7-1: CORRIDOR OF PIPELINE IMPROVEMENTS

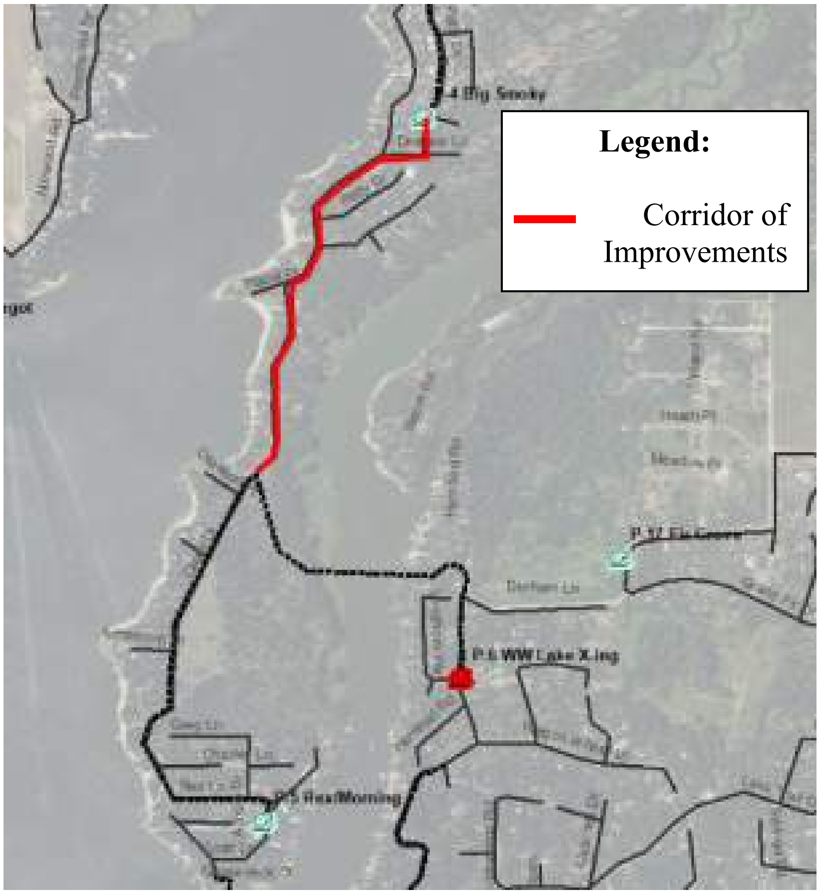


TABLE 7-1: PIPELINE IMPROVEMENT ADVANTAGES AND DISADVANTAGES

Alternative	Advantages	Disadvantages	40-Year Life Cycle Cost
Alternative 1: Increase the size of the existing trunkline	• Could utilize existing pipeline routing, manhole locations • Simpler operations; less complexity	• Higher capital cost • May require additional bypass pumping during construction if new pipeline goes within existing pipeline corridor	$3,872,000
Alternative 2: Extend the existing 8-inch force main from the WW Lake Crossing Lift Station to Big Smoky Lift Station	• Can continue to use existing gravity mains for conveyance during construction • More flexibility with force main alignment • Lower capital cost	• Potential interference with existing infrastructure or services • Increased complexity and risk associated with pumping "downhill" • May require lift station upgrade and control upgrades	$2,566,000

Recommendation

The recommended alternative is to extend the existing 8-inch forcemain from the WW Lake Crossing Discharge to the Big Smoky Lift Station. The option is more cost effective for a 40-year life cycle and allows the District to continue utilizing its gravity trunkline. This alternative allows the District to service out to 20-year and buildout flows.

7.1.2. Pipeline Replacement Alternatives

As pipelines and manholes approach the end of their useful life, the District will need to look into replacement, rehabilitation, and repair options for all of its aging infrastructure. Aging infrastructure increases the chance of failure and sanitary sewer overflows, and the amount of infiltration into the system generally increases. The District has two main options to address pipeline and manhole condition issues: reconstruct the pipelines and manholes through a traditional open cut construction approach or rehabilitate them utilizing trenchless technologies. These alternatives are discussed briefly here.

- Alternative 1: Replace with Traditional Open Cut Technology

  As the collection system infrastructure approaches the end of their useful life, they could be replaced with new pipelines and manholes using traditional open cut installation. This alternative would extend the useful life of the pipeline by the life span of a new pipe/manhole. The District could also choose to increase pipe size or correct pipeline grades as they replace the pipelines. Depending on site constraints (pipe depth, surface restoration, sewer bypass requirements, services, groundwater, soil conditions, existing pipe size and grade, etc.), this alternative may be a preferred approach.

- Alternative 2: Utilize Trenchless Technology for Repair

  Alternatively, the District could utilize trenchless rehabilitation technologies such as pipe bursting, cured-in-place-pipe installation, or slip lining for pipelines and applying special coatings to manholes. Under the right circumstances, these approaches can be less costly than the open cut construction approach. Spot repairs can also be a means of extending the life of a pipeline segment and under certain conditions can be completed without open cut trenching.

  Recommendation

  Keller Associates recommends that each pipeline segment be evaluated to assess the preferred replacement / rehabilitation strategy as part of an ongoing collection system replacement program. This effort includes a careful review of CCTV conditions and other site constraints, and should be completed as part of the concept or pre-design phase of pipeline rehabilitation / replacement projects. Recommended annual collection system replacement budgets are discussed in Chapter 9.

7.2. COMMITTED DEFICIENCY CAPACITY ALTERNATIVES

Based on the analysis in Chapter 3, there are several lift station, gravity trunkline, and forcemain deficiencies in the committed scenario evaluated (which corresponds to a population slightly beyond the 20-year planning period). Deficiencies that have a singular straightforward solution are presented in the CIP in chapter 9. The following subsections evaluate the alternatives to address the deficiencies.

7.2.1. WW Lake Crossing and Day/Wagon Trunkline Alternatives

As shown in Chapter 3, the trunklines upstream of the WW Lake Crossing and the Day and Wagon lift stations are undersized and experience surcharging in this planning period. The following subsection presents the alternatives for addressing capacity concerns. A visual representation of the alternatives is presented in Figure 7-2, and Table 7-2 presents a summary comparison of benefits and drawbacks for each alternative.

- Alternative 1: Upsize Day/Wagon and WW Lake Crossing Trunklines

  The first alternative is to upsize the existing trunklines and increase the pumping capacity at the WW Lake Crossing and Day/Wagon lift stations. Increase the trunkline size from a 10-inch to a 15-inch for both these pipelines allows conveyance for committed and anticipated buildout flows. As a potential cost-saving measure, it may be possible to pipe-burst the trunkline.

- Alternative 2: Create Regional Lift Station to the WWTP

  The second alternative is to construct a regional lift station that collections flow from the Fir Grove subbasin and the DS Lake Crossing Discharge, and pumps flows directly to the WWTP. According to modeling, this alternative would circumvent the need to upsize the existing pipelines. The pumps in the Day/Wagon and WW Lake Crossing lift stations may still require upgrades as they may be undersized in the existing condition (Table 3-1 in Chapter 3), but the upgrades would be less significant due to having to convey less flow. For alternative 2 and 3, one advantage is that this alternative provides additional infrastructure to convey future build-out flows that may want to use the same forcemain to the plant. Additionally, it results in energy efficiencies as wastewater will not have to be pumped over and over ahead in downstream lift stations as it makes its way to the WWTP.

- Alternative 3: Extend DS Lake Crossing forcemain to WWTP

  A third alternative evaluated includes extending the existing DS forcemain all the way to the forcemain. Similar to Alternative 2, the existing trunklines do not need to be upsized in the 20-year period should the DS Lake Crossing forcemain extend to the WWTP. Additionally, the Day/Wagon and WW Lake Crossing lift stations would require less significant upgrades. To reduce head and the scale of lift station upgrades at the WW Lake Crossing, the extension of the forcemains may be a larger size.

FIGURE 7-2: 20-YEAR SOUTHERN CONVEYANCE ALTERNATIVES

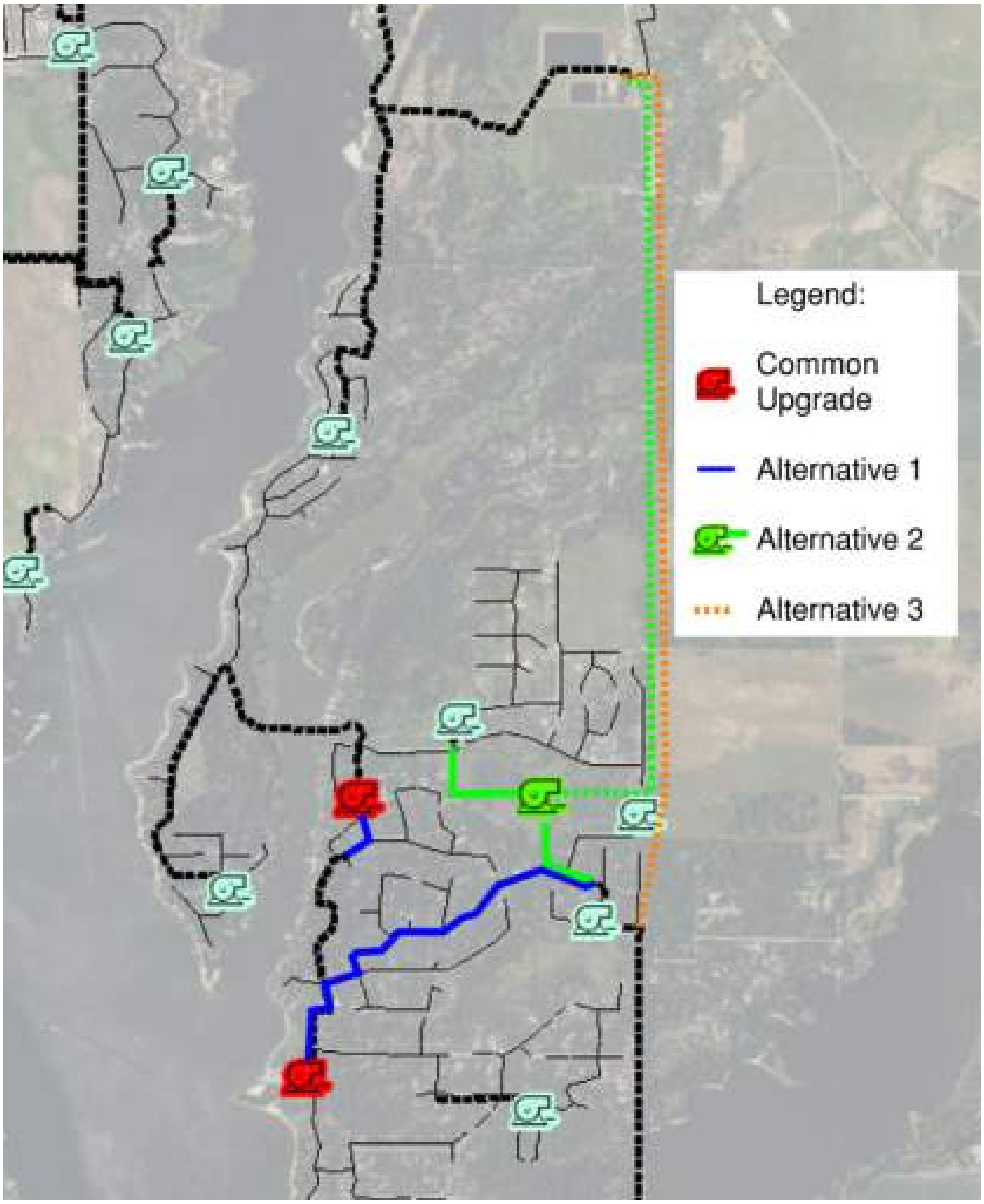


TABLE 7-2: SOUTHERN COLLECTION IMPROVEMENT ADVANTAGES AND DISADVANTAGES

Alternative	Advantages	Disadvantages	40-Year Life Cycle Cost
Alternative 1: Upsize Day/Wagon and WW Lake Crossing Trunklines	• May utilizes existing pipeline routing and manholes • May be possible to use trenchless technology to reduce costs • Can convey buildout flows	• May require additional bypass pumping during construction if new pipeline goes within existing pipeline corridor	$5,324,000
Alternative 2: Create Regional Lift Station to the WWTP	• Eliminate the need to upsize existing pipelines • Potential to take Fir Grove, Camas, and RR Village pump stations offline • Smaller upgrades required at Day/Wagon and Lake Crossing • New forcemain to plant could more efficiently accommodate and deliver build-out flows.	• Increased OM with a larger pump station • May interfere with wetlands/farmland depending on forcemain alignment • Cost of land purchasing/ easement acquiring	$9, 637,000
Alternative 3: Extend DS Lake Crossing forcemain to WWTP	• Eliminate the need to upsize existing pipelines • Smaller upgrades required at Day/Wagon and Lake Crossing • New forcemain to plant could more efficiently accommodate and deliver build-out flows.	• Similar permitting/easement challenges as Alternative 2	$6,404,000

Recommendation

The recommended alternative is to upsize the existing trunklines from 10-inch pipe to an 15-inch pipe. This alternative allows the District to service committed and buildout flows, and does not require construction of an additional lift station and/or forcemain at this time (although additional lift stations and forcemains will be required to accommodate the build-out service area).

Additionally, it is recommended that the District monitor flows within the existing trunkline upstream of these lift stations to assess appropriate timing of improvements. Due to unknowns with phasing of developments, it is recommended these alternatives be re-evaluated and refined prior to proceeding with these improvements to better coordinate existing and future needs.

7.3. FUTURE SHARED FORCEMAIN ALTERNATIVES

As discussed in Chapter 3, a portion of the Poison Creek forcemain exceeds its trigger velocity for improvement within the committed growth planning period. However, this trigger is only exceeded when the Big Smoky flows are introduced to the Poison Creek trunkline. This can be resolved with a recommended additional parallel pipeline from the Big Smoky/Poison Creek forcemain intersection and the WWTP. This upgrade is recommended for all the alternatives presented below.

However, as more flow is conveyed through the major dual 10-inch forcemains beyond the currently committed flows, the head within the pipe increases and impacts the performance of the pump stations that share this forcemain. At buildout, without any improvements beyond the recommended parallel pipeline above, it is anticipated the Poison Creek lift station will have to be able to pump approximately 450 feet of head (compared to existing head of 190 feet)to accommodate peak hour conditions, leading to larger pumps and power requirements. This in turn, results in higher head pumps being required at many downstream lift stations who share the forcemain.

Additionally, there is the added complication of designing pump stations to convey both flow at head at peak conditions and also during lower average conditions. The following alternatives were considered to alleviate this issue:

- Alternative 1: Upsize all lift stations that pump into the shared forcemain

  The first alternative considered is to upgrade all the pump stations to be able to convey through the forcemains simultaneously. The main advantage is that this alternative utilizes the existing infrastructure. However, this will result in larger pumps with higher energy requirements and may leave portions of the existing forcemain undersized for optimum flow conditions.

- Alternative 2: Construct additional parallel forcemain with regular interties

  The second alternative is to construct additional forcemains parallel to the existing forcemains, or upsizing the existing parallel forcemain. This alternative would reduce head requirements of the pump stations and would provide adequate sized pipes for buildout flows. However, utilizing the existing 10-inch dual forcemain layout means the pipeline will have to share existing corridors (some of which are very tight, such as a narrow land-bridge crossing) with other infrastructure, which may cause complications.

- Alternative 3: Construct a new lift station to break head and re-pump

  The final alternative is to construct a new lift station or upgrade an existing lift station along the pipeline corridor where we can break head in the Poison Creek forcemain, and re-pump water to the WWTP. This alternative could provide significant benefits to the head gain of pumps and could reduce upgrade requirements at a number of lift stations. Additionally, an existing lift station site, such as the Meadows lift station, could be re-purposed for the new lift station. However, construction and maintenance of a new lift station would be costly.

TABLE 7-3 SHARED FORCEMAIN ALTERNATIVES

Alternative	Advantages	Disadvantages
Alternative 1: Upgrade all lift stations along shared forcemain	• Utilizes existing infrastructure	• Upgrades anticipated at lift stations along shared forcemain • Additional O&M cost from power requirements • May leave portions of forcemain undersized
Alternative 2: Construct additional parallel forcemains with regular interties	• Properly size forcemains for anticipated buildout flow • Can potentially utilize existing trenches and rights-of-way	• Potential complications with existing utility corridor constraints
Alternative 3: Construct a new lift station to break head and re-pump	• Can potentially eliminate the need for upsizing pumps at some lift stations • May be able to reuse existing lift station site	• May leave portions of forcemain undersized • Additional O&M with a new lift station

Recommendation

The recommended alternative is to upsize the pumps as necessary within the 20-year planning period. However, it should be noted that these major improvements may not be required within the 20-year planning period. The viability of each of these alternatives will heavily depend on the rate and location of developments. It is recommended that the City continue to monitor lift station runtimes and flows through the lift stations along the shared forcemain, and the recommended alternative be re-evaluated in the future to determine which provides the most benefit.

7.4. RECOMMENDED ALTERNATIVES GENERAL IMPACT SUMMARY

The potential environmental impacts of the recommended alternatives are summarized in the following section. A summary of the impacts is shown in

Table 7-4.

- Land Use / Prime Farmland / Formally Classified Lands

  No anticipated changes.

- Floodplains / Wetlands

  None of the recommended alternatives would create new obstructions to the flood plain or be located in wetland areas.

- Cultural, Biological, and Water Resources

  The improvements being recommended are on previously disturbed lands and it is not anticipated that they will interfere with cultural, biological, or water resources.

- Socio-Economic Conditions

  Alternatives are not anticipated to have a disproportionate effect on any segment of the population (economic, social, or cultural status). The main economic effect is the cost of the alternatives.

- Land Requirements

  It is not anticipated that the District would need to purchase land for any of the alternatives. It is anticipated that alternatives would take place within existing roadways and easements.

- Potential Construction Challenges

  The depth of the water table may affect the construction of the alternatives. Subsurface investigations were not within the scope of this project. Construction techniques to effectively manage excavation, dewatering, and sloughing issues should be required of any construction plans. Construction plans for any of the alternatives should also include provisions to control dust and runoff.

- Sustainability Considerations

  Sustainable utility management practices include environmental, social, and economic benefits that aid in creating a resilient utility. None of the alternatives are anticipated to impact the sustainability of the system, with Alternative 1 extending the useful life of the existing infrastructure by replacing it.

TABLE 7-4: EXPECTED GENERAL ENVIRONMENTAL IMPACTS

Environmental Criteria	Existing Big Smoky Pipeline Increase	20-Year Southern Trunklines Pipeline Increase	Buildout Shared Forcemain Pump Upgrades
Land Use/ Prime Farmland / Formally Classified Lands	No Impact	No Impact	No Impact
Floodplains/ Wetlands	No Impact	No Impact	No Impact
Cultural, Biological, and Water Resources	No Impact	No Impact	No Impact
Socio-Economic Conditions	May impact user rates	May impact user rates	May impact user rates
Land Requirements	No Impact	No Impact	No Impact
Potential Construction Problems	No Impact	No Impact	No Impact
Sustainability Considerations	Increase collection system lifespan	Increase collection system lifespan	Increase collection system lifespan

CHAPTER 8 - WASTEWATER TREATMENT ALTERNATIVES

There are many different alternatives to meet the wastewater facility deficiencies listed in Chapter 6. The alternatives in this chapter were discussed with the District and selected for evaluation. The goals of the alternatives were to:

- Find solutions that are practical and cost-effective
- Provide facilities capable of reliably meeting expected permit limits into the future
- Maximize use of existing facilities
- Select facilities that can be constructed without unacceptably impacting effluent quality
- Identify solutions that could be phased to reduce debt and minimize user rate increases

If a WWTP deficiency discussed in the previous chapters had one clear preferred solution (such as upgrading the HVAC system, PLCs, replacing pumps, etc.), then the solution is not discussed here, but is included in the capital improvement plan in Chapter 9 and the individual project summary sheets found in Appendix E.

The advantages, disadvantages, and comparative costs of the alternatives are presented in this chapter. The cost estimates are a Class 5 cost opinion, as defined by the Association for the Advancement of Cost Engineering. They include estimated construction costs with markups of 10% for general conditions, a contingency of 30%, 15% contractor overhead and profit (OH&P), and engineering services including construction of 25% (based on total construction cost).

In addition to project capital costs, annual O&M costs are compared to arrive at a more complete picture of the alternative costs. A 20-year life-cycle cost analysis is provided for most of the alternatives, based on a real discount rate (inflation removed) of 2.0%. The equipment (unless a short-lived asset) is assumed to have a 20-year useful life so no depreciation or salvage value is included for comparing the alternatives. An average rate of $0.08 per kWh was used for estimating power costs and an average labor cost of $60 per hour was used to estimate maintenance costs.

8.1. EFFLUENT DISPOSAL ALTERNATIVES

The District stores treated effluent in Lagoons 4 and 5 for land application in the summer. Additionally, the District owns RI basins northwest of the WWTP that are available for discharge year-round. The lagoons and land application areas were at their capacity periodically in 2022. The RI basins have rarely been used and require maintenance. Two alternatives were chosen by the District and Keller to evaluate, 1) Status Quo - Continued Focus on Land Application; and 2) Utilize the RI Basins.

8.1.1. Status Quo – Continued Focus on Land Application

This alternative would continue to focus on land application without using the RI basins. A new storage lagoon would be constructed for the wintertime flows and additional reuse fields would be added for land application. To accommodate the expected increase in flow during the 20-year planning period an additional 63-million-gallon (MG) winter storage lagoon is included for this alternative. A pipeline would be constructed from Lagoon 5 to the new winter storage lagoon. New transfer structures and piping to the effluent structure are also included to enable water movement to and from the lagoon.

As mentioned, the land application is periodically at capacity. For this alternative an additional 120-acre pasture field was included to handle the flows through 2042. This land was assumed to be within a 1-mile area of the WWTP. To transport water to the new reuse site, a new pipeline will be installed. The irrigation pumps will also need to be replaced to increase the flow capacity.

8.1.2. Utilize the RI Basins

This alternative would use the RI basins more than they have in the past. The land application system would still operate to provide discharge flexibility, but no additional winter storage or land application area would be added. A spare irrigation pump is included in this alternative for redundancy. In this alternative, the District would perform rehabilitation on the RI basins. The RI basins need to be cleared of brush and trees for proper infiltration. This is to ensure that water will infiltrate properly for hydraulic loading considerations. Additionally, the valves on each of the pipelines should be exercised to ensure proper operation, and if necessary, replaced.

Testing when using the RI basins is different than to the land application system, as discussed in Chapter 1 and as outlined in the permit (Reuse Permit LA-000070-04; Appendix A). Constituent limits include a maximum phosphorus loading of 8.3 kilograms per month, 10 mg/L total nitrogen concentration, and 100 mg/L as a 30-day average for TSS. The disinfection requirement is a median number of total coliform organisms less than or equal to 23 per 100 mL, based on the last five days of sampling, with no sample exceeding 230 organisms per 100 mL. As noted in previous chapters, the District will need to remove additional phosphorus to meet the discharge water quality requirements. For this alternative, it was assumed that the existing aluminum sulfate (alum) dosing system would be able to be used to support phosphorus precipitation. Phosphorus removal is discussed in more detail in this chapter. The UV disinfection system is assumed to be upgraded as part of this alternative due to the age of the system.

8.1.3. Alternatives Comparison

A summary of the advantages and disadvantages of these two alternatives are shown in Table 8-1.

TABLE 8-1: EFFLUENT DISPOSAL ADVANTAGES AND DISADVANTAGES

Alternative	Advantages	Disadvantages
Alternative 1 – Status Quo – Continued Focus on Land Application	• Does not require chemicals for phosphorus removal • Provides storage security	• High capital cost • Large area needed for lagoon and land application
Alternative 2 – Utilize the RI Basins	• Much lower capital cost • Uses existing system – does not require additional land • Provides flexibility to utilize both RI basins and land application system	• Higher O&M costs to add chemicals for phosphorus removal and to pump the additional distance to the RI basins • Additional monitoring and additional risk for RI basin discharge compliance

A preliminary 20-year life cycle cost comparison of the alternatives is summarized in Table 8-2. The annual O&M costs are associated with effluent disposal only. O&M associated with the operation of the lagoons or MBR, that are not directly associated with the disposal (e.g., aeration, screening, etc.) were not included.

TABLE 8-2: EFFLUENT DISPOSAL COST COMPARISON (2023)

Item	Alt. 1 - Status Quo - Land App	Alt. 2 - Utilize the RI Basins
New Lagoon	$ 3,845,000	$ -
New Land Application Equipment	$ 200,000	$ -
Pipes and Appurtenances	$ 1,260,000	$ -
New Pump(s)	$ 250,000	$ 50,000
Disinfection System Improvements	$ 250,000	$ 200,000
Dosing System Piping	$ -	$ 50,000
RI Basin Refurbishment	$ -	$ 200,000
Electrical and Controls	$ 60,000	$ 25,000
Improvements Subtotal	**$ 5,865,000**	**$ 525,000**
General Conditions	$ 587,000	$ 53,000
Subtotal	**$ 6,452,000**	**$ 578,000**
Contingencies	$ 1,936,000	$ 174,000
Subtotal	**$ 8,388,000**	**$ 752,000**
Contractor OH&P	$ 1,259,000	$ 113,000
Construction Cost	**$ 9,647,000**	**$ 865,000**
Engineering and Construction Services	$ 2,412,000	$ 217,000
Land Purchase	$ 4,500,000	$ -
Total Project Cost	**$ 16,559,000**	**$ 1,082,000**
Electricity	$ 4,000	$ 9,000
Chemicals	$ 9,000	$ 65,000
Disposal	$ -	$ -
Parts	$ 11,000	$ 14,000
Personnel	$ 16,000	$ 16,000
Estimated Annual O&M	**$ 40,000**	**$ 104,000**
20-Year Life Cycle Cost	**$ 17,220,000**	**$ 2,790,000**

Recommendation

The recommended alternative is to utilize the RI Basins (Alternative 2). This alternative requires the least capital cost and does not require additional land.

8.2. PHOSHPORUS REMOVAL ALTERNATIVES

The permit limits the effluent total phosphorus loading to 8.3 kg/month to the RI basins. As discussed in Chapter 5, with current flows, the WWTP would struggle to meet the phosphorus discharge limits without additional phosphorus removal. To reliably achieve the phosphorus limits, chemical addition is recommended. The coagulants will target the soluble reactive phosphorus to form particles that can be removed through the MBR membranes. Since iron can stain components, ferric chloride and ferric sulfate were not included in this evaluation. Two different chemicals will be analyzed: aluminum sulfate (alum) and rare earth.

8.2.1. Aluminum Sulfate (Alum)

The addition of alum to wastewater produces a metal hydroxide precipitate. These precipitates stick together to form flocs which can bind phosphate to its surface by an adsorption mechanism. The reaction for the precipitation of phosphorus using aluminum sulfate (alum) is as follows:

- Al3+ + HnPO43-n ⇔ AlPO4 + nH+

Based on this equation, one mole of aluminum will precipitate one mole of phosphate. However, chemical reactions are influenced by other competing reactions as well as factors such as pH, mixing, chemical dose, soluble phosphorus concentration, and age of the metal precipitate. Bench or full-scale testing provides more site-specific information to determine required dosages. Dose rates can be as high as 10-30 moles of aluminum per mole of phosphorus to achieve <0.5 mg/L-P.

The WWTP is already set-up to use alum for phosphorus removal. There are two 2,500-gallon insulated tanks and chemical feed pumps for alum within the MBR building. There is also an injection line installed at the aeration basins. The addition of alum will increase the amount of sludge produced as the metals form precipitates. Additional sludge removal costs are included in the cost comparison.

8.2.2. Rare Earth

Rare earth is another coagulant that can be added to wastewater to removal phosphorus. Rare earth elements such as Lanthanum (La) and Cerium (Ce) are typically provided in a chloride solution. When combined with phosphate, the solution forms a metal phosphate precipitate called rhabdophane. The reaction for the phosphorus precipitation using rare earth (RE) is as follows:

- $RE^{3+} + PO_4^{3-} \rightarrow REPO_4 \cdot H_2O$

Rare earth elements have a high affinity for phosphates; rare earth is typically dosed at a 1:1 mole ratio to achieve phosphorus levels as low as 0.05 mg/L-P. Rare earth does not typically drop the pH as much as alum since the chemical solution pH is 3-4 compared to alum's pH which is near 2. Also, the effluent performance is typically more reliable than with alum.

A similar MBR system by Veolia in Park City, Utah (Jordanelle Special Service District) switched from alum to rare earth. The Jordanelle Special Service District's phosphorus effluent limit is similar to the District's, and they were able to achieve their limit while using much fewer chemicals. Also, it does not appear that rare earth caused fouling of the membranes.

Rare earth chlorides are typically dosed at the same location as alum. For this analysis, it was assumed that the rare earth solution would be delivered in totes. Minor piping and pump upgrades may be needed to the MBR system to adjust for the new chemical. Since less rare earth is needed than alum, the amount of sludge produced is less.

8.2.3. Alternatives Comparison

A summary of the advantages and disadvantages of the two coagulants is shown in Table 8-3.

TABLE 8-3: PHOSPHORUS REMOVAL ADVANTAGES AND DISADVANTAGES

Alternative	Advantages	Disadvantages
Alternative 1 – Aluminum Sulfate	• Familiar chemical • Lower cost per gallon	• Higher chemical usage • Can decrease pH more than rare earth if insufficient alkalinity • Produces higher volume of sludge
Alternative 2 – Rare Earth	• Lower chemical use • More reliable reduction of phosphorus • Does not drop pH as drastically as alum • Less sludge production • Has lower freezing point	• Higher cost per gallon • Familiarization with a new chemical • Potential supply chain issues

A preliminary 20-year life cycle cost comparison of the alternatives is summarized in Table 8-4. Life cycle costs include anticipated sludge production to provide a more complete cost comparison.

TABLE 8-4: PHOSPHORUS REMOVAL COST COMPARISON (2023)

Item	Alt. 1 - Alum	Alt. 2 - Rare Earth
Dosing System and Piping	-	$ 50,000
Improvements Subtotal	**$ -**	**$ 50,000**
General Conditions	$ -	$ 5,000
Subtotal	**$ -**	**$ 55,000**
Contingencies	$ -	$ 17,000
Subtotal	**$ -**	**$ 72,000**
Contractor OH&P	$ -	$ 11,000
Construction Cost	**$ -**	**$ 83,000**
Engineering and Construction Services	$ -	$ 21,000
Total Project Cost	**$ -**	**$ 104,000**
Electricity	$ 1,000	$ 1,000
Chemicals	$ 63,000	$ 55,000
Disposal	$ 4,000	$ 1,000
Parts	$ 3,000	$ 3,000
Personnel	$ 8,000	$ 8,000
Estimated Annual O&M	**$ 79,000**	**$ 68,000**
20-Year Life Cycle Cost	**$ 1,292,000**	**$ 1,216,000**

Recommendation

A thorough analysis of the two coagulants is difficult without bench/pilot testing. The District plans to pilot test rare earth in 2023 to determine how the system performs and the actual costs through dosing optimization. It may be beneficial from a supply chain perspective to have provisions to use either coagulant.

8.3. BIOSOLIDS HANDLING ALTERNATIVES

Currently, biosolids from the MBR are sent to Lagoon 1, which is nearing capacity. The District would ideally like to produce Class A biosolids. Class A biosolids are acceptable for human contact and can be used almost anywhere; however, they require extensive sampling and treatment (pathogen and vector attraction reduction).

Alternatives for biosolids handling were discussed with the District. The following were selected for evaluation: 1) Status Quo – Continue to Use Lagoon, 2) Mechanical Dewatering, 3) Mechanical Drying, and 4) Composting. The first two alternatives would not produce Class A biosolids, but mechanical drying and composting are two alternatives that would produce Class A biosolids.

8.3.1. Status Quo – Continue to Use Lagoon

Under this alternative, the District would elect to make no improvements to the solids handling method. The District would coordinate with DEQ to allow a contractor to dredge and haul solids out of Lagoon 1 and coordinate the disposal at a landfill. With this alternative, it was assumed that dredging would occur three times over the 20-year planning period to avoid overloading the lagoon. A direct quote from a contractor that includes the contractor's markups (e.g., general conditions and overhead and profit) has been included in the cost estimate in Table 8-6. Based on discussions with landfills in the region, it was estimated that disposal would need to occur near Boise at the Simco Road Landfill. Hauling costs were assumed to be included in the dredging cost.

8.3.2. Mechanical Dewatering

Dewatering is a physical process in which water is removed from the biosolids to reduce volume and weight. Several dewatering technologies are available for dewatering biosolids, and each has its own advantages and disadvantages. For this alternative, it was assumed that a screw press would be utilized. A screw press uses a slowly rotating tapered screw, surrounded by a perforated plate or wedge wire screen, to convey the sludge through a screen basket. There is a gravity drain zone and a pressure zone to compress and dewater the solids. The screw and screen are enclosed in a stainless-steel assembly as shown in Figure 8-1. Polymer is added prior to the screw press for flocculation. Dewatered solids are discharged from the end of the screw. Filtrate is discharged at the bottom of the unit. Screw presses operate at low speeds, can start, and stop unattended, have sensors to stop automatically, and are capable of 24/7 operation.

FIGURE 8-1: SCREW PRESS

It is highly recommended that the screw press would be located inside a building. One screw press is intended to be installed initially, with provisions for a second one in the future. Lagoon 1 could be utilized as a backup when only one screw press is installed. To dispose of the dewatered solids, a truck could be purchased by the District. Hauling is estimated to be to the Simco Road Landfill. According to the landfill, the solids will need to be tested approximately quarterly for solids percentage, ignitability, metals, volatile organic compounds, and pesticides/dioxins.

The dewatered biosolids would likely not achieve Class A requirements without additional treatment. Typical additional treatment processes include lime and steam injection, drying, and composting.

8.3.3. Mechanical Drying

Several drying technologies are available that would meet Class A requirements. For this alternative, it was assumed that a belt dryer would be utilized. Drying is based on the removal of water from dewatered solids, which accomplishes both volume and weight reduction. Dewatered solids from the screw press would be conveyed to the belt dryer where most of the water is removed via evaporation, resulting in approximately 90% solids. An example of a belt dryer is shown in Figure 8-2.

FIGURE 8-2: BELT DRYER

A belt dryer is referred to as a “direct” dryer, where hot air flows through a process vessel and comes into direct contact with the wet solids. This contact allows the transfer of thermal energy and evaporation. During drying, a significant amount of energy is needed to evaporate the water and heat the solids. The entire dryer system includes the dryer, materials handling equipment, heat generation and transfer equipment, air movement and distribution equipment, emissions control equipment, and ancillary control systems. The dryer system equipment would be located inside a building.

To provide redundancy, it was assumed that Lagoon 1 would be used as a backup for sludge holding if the dryer system was down. Therefore, the cost for only one dryer is included in the cost estimate. For this alternative, sludge dewatering would need to occur prior to drying. A screw press was assumed to provide the dewatering. It was assumed that the dried biosolids would be taken by the community therefore eliminating any sludge disposal costs.

8.3.4. Composting

Composting is another method to produce Class A biosolids (Section 40 of the Code of Federal Regulations Part 503 (40 CFR 503)). Similar to the belt dryer, composting would occur after dewatering has been completed. Composting requires a bulking agent, generally a woody material. Although this does create another feedstock demand, it can also be a sustainable solution to find beneficial use of green waste.

There are a wide variety of composting technologies available. Below is a summary of the main types:

- Turned Windrow (both aerated and unaerated) – Mostly a manual operation with large equipment doing the turning. Product is processed in large windrows which are periodically turned and mixed to get adequate curing and processing.
- Aerated Static Pile (ASP) – A form of thermophilic composting accelerated and managed through the pushing or pulling of air through the compost pile. Pipes connected to a blower deliver air into the bottom of the pile in timed cycles. Aeration facilitates the stabilization process and provides temperature control.
- Fabric Covered ASP – A form of the aerated static pile process that uses breathable fabric covers over the piles. These covers capture and filter odors while keeping additional moisture away from the piles. Because they have fabric covers these facilities generally do not have buildings or roofs over the piles, which decreases the capital cost.
- Agitated Bay – Aerated concrete bays with a mechanical agitation machine that advances the material through the active composting phase. Raw material enters at one end and compost ready for curing exits at the other end.
- Tunnel – Process in which batches of raw composting material are placed in air-tight vessels. The material is aerated at a high rate with a blend of recirculated air and fresh air.

For this evaluation, Fabric Covered ASP was selected for further review since it would eliminate some of the odors and would have relatively modest capital and operational costs. The fabric covered system is broken up into three phases for a total of eight weeks in the process (Phase 1 – 4 weeks; Phase 2 – 2 weeks; and Phase 3 – 2 weeks). The composting operation would occur in a three-sided bunker with a fabric cover. The material is moved to a new bunker at the start of each phase. The movement agitates the material releasing moisture and redistributing the microbes and biosolids. Each of the three-sided bunkers also has an aeration system with trenches in the floor under the compost for pipes to carry the air to the compost. There is no foul air collection system included as the covers provide a relatively good amount of odor control. An example of bunkers used for fabric cover composting is shown in Figure 8-3.

FIGURE 8-3: FABRIC COVER ASP COMPOSTING

Prior to composting, the biosolids will be mixed with a bulking agent. The bulking agent provides a source of carbon vital to the process and provides porosity for air distribution to the biosolids. Additionally, the bulking agent provides a drying material. This is vital for proper composting and to achieve time and temperature set points. Therefore, it is important to protect the bulking agent from excess moisture (rain and snow). For this alternative, it was assumed that the District is able to use access bulking material from their reuse sites and other yard waste donations.

To accomplish the mixing, it is proposed the facility will use a mixer truck. This specialized equipment has a large hopper in the base with mixing screws or paddles. The truck will also have a built-in scale for proper metering of the biosolids and bulking agents and a side discharge conveyor. The mixing truck will generally be parked at the dewatering building where biosolids can be discharged directly from dewatering into the truck. It will then go to the screening/bulking agent storage area where a bulking agent will be added by a front-end loader. The truck will blend the material and discharge it in front of the compost pile.

8.4. ALTERNATIVES COMPARISON

A summary of the advantages and disadvantages are shown in Table 8-5.

TABLE 8-5: BIOSOLIDS HANDLING ADVANTAGES AND DISADVANTAGES

Alternative	Advantages	Disadvantages
Alternative 1 – Status Quo – Continue to Use Lagoon	• Does not require new infrastructure	• High dredging and disposal costs • Does not produce Class A biosolids • Dredging frequency will increase throughout planning period
Alternative 2 –Mechanical Dewatering	• Can be part of a future Class A system • Can operate unattended • Provides volume reduction • Lower life-cycle cost than status quo	• Additional treatment is needed to produce Class A biosolids • Treatment of filtrate is required
Alternative 3 – Mechanical Dryer	• Produces Class A biosolids • Can operate unattended • Volume and mass reduction • Reuse benefit to the public • Potential revenue • May be effective against future contaminants of concern	• High capital costs • Energy intensive • Requires new permitting and footprint expansion • Reliance on public demand for disposal • Dust and fire hazards
Alternative 4 – Composting	• Produces Class A biosolids • Reuse benefit to the public • Potential revenue	• Labor intensive • High capital costs • Requires bulking material • Odors can be a concern • Requires new permitting and footprint expansion • Reliance on public demand for disposal

A preliminary 20-year life cycle cost comparison of the alternatives is summarized in Table 8-6. The annual O&M costs are associated with the biosolids handling only. O&M associated with the operation of the lagoons or MBR, that are not directly associated were not included. The cost for dredging is assumed to be by a contractor, so there was no annual O&M cost associated with disposal.

TABLE 8-6: BIOSOLIDS HANDLING COST COMPARISON (2023)

Item	Alt. 1 - Status Quo - Lagoon	Alt. 2 - Mechanical Dewatering	Alt. 3 - Mechanical Dryer	Alt. 4 - Composting
Lagoon Sludge Removal	$ 2,515,000	$ -	$ -	$ -
Site Work	$ -	$ 110,000	$ 150,000	$ 160,000
Screw Press	$ -	$ 304,000	$ 304,000	$ 304,000
WAS Pumps	$ -	$ 60,000	$ 60,000	$ 60,000
Belt Dryer	$ -	$ -	$ 1,150,000	$ -
Compost Structures	$ -	$ -	$ -	$ 343,000
Bulking Agent Screen and Storage	$ -	$ -	$ -	$ 266,000
Compost System	$ -	$ -	$ -	$ 763,000
Building	$ -	$ 300,000	$ 800,000	$ -
Pipes and Appurtenances	$ -	$ 60,000	$ 60,000	$ 60,000
Electrical and Controls	$ -	$ 90,000	$ 340,000	$ 170,000
Improvements Subtotal	**$ 2,515,000**	**$ 924,000**	**$ 2,864,000**	**$ 2,126,000**
General Conditions	$ -	$ 93,000	$ 287,000	$ 213,000
Subtotal	**$ 2,515,000**	**$ 1,017,000**	**$ 3,151,000**	**$ 2,339,000**
Contingencies	$ 755,000	$ 305,000	$ 946,000	$ 702,000
Subtotal	**$ 3,270,000**	**$ 1,322,000**	**$ 4,097,000**	**$ 3,041,000**
Contractor OH&P	$ -	$ 199,000	$ 615,000	$ 457,000
Construction Cost	**$ 3,270,000**	**$ 1,521,000**	**$ 4,712,000**	**$ 3,498,000**
Engineering and Construction Services	$ 164,000	$ 381,000	$ 1,178,000	$ 875,000
Total Project Cost	**$ 3,434,000**	**$ 1,902,000**	**$ 5,890,000**	**$ 4,373,000**
Electricity and Fuel	$ -	$ 3,000	$ 61,000	$ 15,000
Chemicals	$ -	$ 13,000	$ 12,000	$ 12,000
Disposal	$ -	$ 33,000	$ -	$ -
Parts	$ -	$ 4,000	$ 42,000	$ 13,000
Personnel	$ -	$ 30,000	$ 60,000	$ 120,000
Estimated Annual O&M	**$ -**	**$ 83,000**	**$ 175,000**	**$ 160,000**
20-Year Life Cycle Cost	**$ 3,434,000**	**$ 3,260,000**	**$ 8,752,000**	**$ 6,990,000**

Recommendation

The recommended alternative is to install mechanical dewatering (Alternative 2). This alternative has the lowest 20-year lifecycle cost. The District has expressed interest in Class A treatment of biosolids and mechanical dewatering would be a helpful step towards a Class A treatment process.

8.5. RECOMMENDED ALTERNATIVES GENERAL IMPACT SUMMARY

The potential environmental impacts of the recommended alternatives are summarized in the following section. A summary of the impacts is shown in Table 8-7.

- Land Use / Prime Farmland / Formally Classified Lands

No anticipated changes.

- Floodplains / Wetlands

None of the alternatives would create new obstructions to the flood plain or be located in wetland areas.

- Cultural, Biological, and Water Resources

The improvements being evaluated are on previously disturbed lands and it is not anticipated that they will interfere with cultural, biological, or water resources. Phosphorus removal will improve the quality of the effluent.

- Socio-Economic Conditions

Alternatives are not anticipated to have a disproportionate effect on any segment of the population (economic, social, or cultural status). The main economic effect is the cost of the alternatives.

- Land Requirements

It is not anticipated that the City would need to purchase land for any of the alternatives. New developments would be on District owned land.

- Potential Construction Problems

The depth of the water table may affect the construction of the alternatives. However, subsurface investigations were not within the scope of this project. Construction techniques to effectively manage excavation, dewatering, and sloughing issues should be required of any construction plans. Construction plans for any of the alternatives should also include provisions to control dust and runoff.

- Sustainability Considerations

Sustainable utility management practices include environmental, social, and economic benefits that aid in creating a resilient utility. Additional solids treatment at the WWTP would require additional energy but improve the quality of the solids disposed.

TABLE 8-7: EXPECTED GENERAL ENVIRONMENTAL IMPACTS

Environmental Criteria	WWTP Alternatives		
	Alum	Mechanical Dewatering	Utilize the RI Basins
Land Use/ Prime Farmland / Formally Classified Lands	No Impact	No Impact	No Impact
Floodplains/ Wetlands	No Impact	No Impact	No Impact
Cultural, Biological, and Water Resources	Improve effluent water quality	No Impact	No Impact
Socio-Economic Conditions	May impact user rates	May impact user rates	May impact user rates
Land Requirements	No Impact	No Impact	No Impact
Potential Construction Problems	No Impact	No Impact	No Impact
Sustainability Considerations	No Impact	Increase in energy requirements	No Impact

CHAPTER 9 - CAPITAL IMPROVEMENT PLAN

The alternative evaluations conducted in Chapters 7 and 8 for collections and treatment, respectively, helped the District make decisions for the wastewater system deficiencies. Additionally, findings from the conditions assessment presented in Chapters 2 and 4 for the collection and treatment systems, respectively, were used to identify additional capital improvements and make recommendations for ongoing maintenance/replacement budgets. This chapter discusses the recommended plan to address the wastewater system deficiencies and is called the Capital Improvement Plan (CIP).

9.1. PRELIMINARY PROJECT DESIGN

9.1.1. COLLECTION SYSTEM

Priority 1

Projects for the collection system should be completed within the next five years. These projects include:

- Completion of a SCADA Master Plan
- Replacing pumps to meet redundancy and existing system flow firm capacity requirements
- Increasing pipeline capacity to meet existing system flow d/D requirements
- Replacing broken equipment such as check valves and level sensors
- Improving site safety and security with fencing, locks, fall protection,
- Other necessary measures intended to extend the life of equipment

Priority 2

Projects for the collection system should be updated as growth occurs and budget allows, within the next 20 years. These projects include:

- Parallel force main construction to increase conveyance to WWTP
- Gravity line improvements to increase capacity for future flows
- Installation of flow meters, gauges, air release valves, and transfer switches to improve operations and reliability at pump stations
- Upgrading pumps to meet future system flow firm capacity requirements

9.1.2. TREATMENT SYSTEM

Priority 1

Priority 1 projects for the WWTP includes items that should take place early in the 20-year planning period. These projects include:

- Removing the solids and replacing the diffusers in Lagoons 1 and 2,
- A sludge dewatering system to avoid future emergency cleanouts of the lagoons
- Headworks building upgrades including a grit removal system and HVAC improvements
- RI basin maintenance
- A new chemical dosing system for phosphorus removal
- A spare parts inventory
- SCADA/PLC upgrades
- Conversion of the land application disinfection from chlorine gas to liquid chlorine

Priority 2

Priority 2 improvements are items to improve the WWTP operations but are not needed during the 20-year planning period. These projects include:

- Additional membranes and permeate pumps to fully populate the membrane basins
- Upgraded blowers for energy efficiency and capacity
- Solids drying to achieve Class A biosolids

9.2. PERMIT REQUIREMENTS

The District's current permit expired on December 20, 2015 but has been administratively extended. The District has applied to renew the Permit and is currently waiting for DEQ. The recommendations set forth in the CIP are designed to keep the District in compliance with the permit.

9.3. ENGINEER'S OPINION OF PROBABLE COST

The summary of the collection and treatment system improvement costs are shown in Table 9-1and Notes: The cost estimate herein is concept level information only based on our perception of current conditions at the project location and its accuracy is subject to significant variation depending upon project definition and other factors. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. This cost opinion is in 2023 dollars and does not include escalation to time of actual construction. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

Table 9-2, respectively. Individual project sheets with additional details are included in Appendix D and E. Costs shown are planning-level estimates (Class 5 cost opinion by the Association for the Advancement of Cost Engineering) and can vary depending on market conditions. For the most part, the project line items in the CIPs include estimated construction costs with markups of 10 percent for general conditions, a contingency of 30 percent, 15 percent contractor overhead and profit, and engineering services including construction of 25 percent (based on total construction cost). These costs should be updated as the projects are further refined in the design phases.

TABLE 9-1: COLLECTIONS 20-YEAR CAPITAL IMPROVEMENT PLAN

Project ID #	Project Name	Primary Purpose	Total Estimated Cost (2023 Dollars) [1]
Priority 1 Improvements (Prior to 5 years)			
1.1	Pump Station SCADA Improvements	Data information collection and tracking	$1,210,000
1.2	Downstream WW Lake Crossing Gravity Line Improvement	Increase pipeline capacity	$3,872,000
1.3	WW Lake X-ing Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$160,000
1.4	Day/Wagon Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$260,000
1.5	Mtn Shadows Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$140,000
1.6	Mtn Meadows Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$180,000
1.7	Ponderosa Pump Station Upgrades	Correct existing pump redundancy deficiency	$60,000
1.8	Big Smoky Pump Station Upgrades	Correct existing pump redundancy deficiency	$80,000
1.9	Rex/Morning Pump Station Upgrades	Correct existing pump redundancy deficiency	$70,000
1.10	Hawks Bay Pump Station Upgrades	Correct existing pump redundancy deficiency	$69,000
1.11	The Reserve Pump Station Upgrades	Correct existing pump redundancy deficiency	$77,000
1.12	FM Church Camp Pump Station Upgrades	Correct existing pump redundancy deficiency	$30,000
1.13	Tamarack (Discovery, Upper) Pump Station Upgrades	Correct existing pump redundancy deficiency	$25,000
1.14	Pump Station Safety and Security Improvements	Improved system safety and security	$580,000
1.15	Little Lane Pump Station Upgrades	Improved efficiency and operation	$32,000
1.16	Grasmick Pump Station Upgrades	Improved efficiency and operation	$52,000
1.17	Smiling Julie Pump Station Upgrades	Improved efficiency and operation	$16,000
1.18	Camas Pump Station Upgrades	Prevention of backflow	$14,000
1.19	Margot Pump Station Upgrades	Prevention of backflow	$30,000
1.20	Jack's Loop Pump Station Upgrades	Improved level control	$7,000
1.21	Poison Creek Pump Station Upgrades	Improved level control and lifespan	$16,000
1.22	Steelhead Pump Station Upgrades	Improved level control and lifespan	$10,000
		Total Collections Priority 1 Improvements (rounded)	**$6,990,000**
Priority 2 Improvements (Prior to 20 years)			
2.1	Parallel Force Main to WWTP	Increase conveyance capacity to WWTP	$2,244,000
2.2	Upstream WW Lake Crossing Lift Station Gravity Line Improvement	Increase pipeline capacity	$996,000
2.3	Upstream Day/Wagon Lift Station Gravity Line Improvement	Increase pipeline capacity	$5,324,000
2.4	Pump Station Air Release Valve Improvements	Improve pipe pressures	$150,000
2.5	Pump Station Flow Monitoring Improvements	Improved efficiency, operation, and management	$1,400,000
2.6	Pump Station Gauge Improvements	Improved efficiency and operation	$180,000
2.7	Pump Station Backup Power Improvements (Transfer Switches Only)	Improved reliability and emergency coverage	$620,000
2.8	20-Yr WW Lake X-ing Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$1,750,000
2.9	20-Yr Ponderosa Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$220,000
2.10	20-Yr Big Smoky Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$1,750,000
2.11	20-Yr Rex/Morning Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.12	20-Yr Jack's Loop Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.13	20-Yr Hawks Bay Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$208,000
2.14	20-Yr Poison Creek Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$894,000
2.15	20-Yr Smiling Julie Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.16	Fir Grove Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$144,000

Project ID #	Project Name	Primary Purpose	Total Estimated Cost (2023 Dollars) [1]
2.17	Day Star Lake X-ing Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$122,000
2.18	Arrowhead Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$20,000
2.19	Hillhouse Pump Station Upgrades	Replacement of worn components	$46,000
2.20	RR Village Pump Station Upgrades	Replacement of worn components	$11,800
2.21	Lake Forest Pump Station Upgrades	Improved efficiency and operation	$3,000
2.22	Meadows (West Mtn) Pump Station Upgrades	Improved efficiency and operation	$15,000
		Total Collections Priority 2 Improvements (rounded)	**$16,427,800**

Notes: The cost estimate herein is concept level information only based on our perception of current conditions at the project location and its accuracy is subject to significant variation depending upon project definition and other factors. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. This cost opinion is in 2023 dollars and does not include escalation to time of actual construction. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

TABLE 9-2: TREATMENT 20-YEAR CAPITAL IMPROVEMENT PLAN

Project ID#	Project Name	Primary Purpose	Total Estimated Cost (2023 Dollars) [1]
Priority 1 Improvements			
1.1	Lagoon Sludge Removal and Diffuser Replacement	Operations	$1,280,000
1.2	Dewatering System	Operations, Capacity	$1,902,000
1.3	Headworks (Grit Removal, HVAC Upgrade)	Operations	$1,190,000
1.4	RI Basin Maintenance	Operations, Capacity	$978,000
1.5	Phosphorus Removal	Permit Compliance	$104,000
1.6	Miscellaneous Items including Spare Parts	Operations, Capacity, Redundancy	$455,000
1.7	SCADA and PLC Upgrades	Operations	$474,000
1.8	Convert Disinfection from Gas to Liquid Chlorine	Safety, Capacity	$707,000
	Total WWTP Priority 1 Improvements (rounded)		**$7,090,000**
Priority 2 Improvements			
2.1	Blower Upgrade	Power Savings, Capacity	$2,879,000
2.2	Belt Dryer	Operations	$5,058,000
2.3	Additional Membranes and Permeate Pumps	Capacity	$572,000
		Total WWTP Priority 2 Improvements (rounded)	**$8,509,000**
		TOTAL TREATMENT PLANT IMPROVEMENT COSTS (rounded)	**$15,599,000**

Notes: The cost estimate herein is concept level information only based on our perception of current conditions at the project location and its accuracy is subject to significant variation depending upon project definition and other factors. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. This cost opinion is in 2023 dollars and does not include escalation to time of actual construction. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

9.4. PROJECT SCHEDULE

9.4.1. Collection System

An estimated schedule for the collection system Priority 1 improvements over the next 5 years is shown in Table 9-3. In order to provide a more affordable project, Priority 1 improvements may need to be phased over a multi-year project to maximize grant funds through multiple application cycles. In the table, gray lines assume 20% of project costs are spent in the year before to cover permitting, engineering, and other preconstruction costs. Actual costs may vary depending on market conditions and should be updated as projects are further refined in the pre-design and design phases.

TABLE 9-3: COLLECTION PRIORITY 1 CIP SCHEDULE (2023 DOLLARS)

CIP ID	Capital Improvement Item	Total Cost (2023 dollars)	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1.1	Pump Station SCADA Improvements	$1,210,000		$242,000	$968,000		
1.2	Downstream WW Lake Crossing Gravity Line Improvement	$3,872,000			$774,400	$3,097,600	
1.3	WW Lake X-ing Pump Station Upgrades	$160,000	$160,000				
1.4	Day/Wagon Pump Station Upgrades	$260,000	$260,000				
1.5	Mtn Shadows Pump Station Upgrades	$140,000		$140,000			
1.6	Mtn Meadows Pump Station Upgrades	$180,000		$180,000			
1.7	Ponderosa Pump Station Upgrades	$60,000		$60,000			
1.8	Big Smoky Pump Station Upgrades	$80,000		$80,000			
1.9	Rex/Morning Pump Station Upgrades	$70,000			$70,000		
1.10	Hawks Bay Pump Station Upgrades	$69,000			$69,000		
1.11	The Reserve Pump Station Upgrades	$77,000			$77,000		
1.12	FM Church Camp Pump Station Upgrades	$30,000			$30,000		
1.13	Tamarack (Discovery, Upper) Pump Station Upgrades	$25,000			$25,000		
1.14	Pump Station Safety and Security Improvements	$580,000				$116,000	$464,000
1.15	Little Lane Pump Station Upgrades	$32,000					$32,000
1.16	Grasmick Pump Station Upgrades	$52,000					$52,000
1.17	Smiling Julie Pump Station Upgrades	$16,000					$16,000
1.18	Camas Pump Station Upgrades	$14,000	$14,000				
1.19	Margot Pump Station Upgrades	$30,000	$30,000				
1.20	Jack's Loop Pump Station Upgrades	$7,000					$7,000
1.21	Poison Creek Pump Station Upgrades	$16,000					$16,000
1.22	Steelhead Pump Station Upgrades	$10,000					$10,000
Total Capital Costs		**$6,990,000**	**$464,000**	**$702,000**	**$2,013,400**	**$3,213,600**	**$597,000**

Note: Gray lines assume 20% of project costs spent in the year before to cover permitting and engineering

9.5. TREATMENT SYSTEM

An estimated schedule for the treatment system Priority 1 improvements over the next 5 years is shown in TABLE 9-4.

TABLE 9-4: TREATMENT PRIORITY 1 CIP SCHEDULE (2023 DOLLARS)

CIP ID#	Capital Improvement Item	Total Cost (2023 dollars)	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1.1	Lagoon Sludge Removal and Diffuser Replacement	$ 1,280,000	$ 1,280,000	$ -	$ -	$ -	$ -
1.2	Dewatering System	$ 1,902,000	$ -	$ 380,000	$ 1,331,000	$ 191,000	$ -
1.3	Headworks (Grit Removal, HVAC Upgrade)	$ 1,190,000	$ -	$ 238,000	$ 833,000	$ 119,000	$ -
1.4	RI Basin Maintenance	$ 978,000	$ 196,000	$ 685,000	$ 97,000	$ -	$ -
1.5	Phosphorus Removal	$ 104,000	$ 3,000	$ 9,000	$ 92,000	$ -	$ -
1.6	Miscellaneous Items including Spare Parts	$ 455,000	$ 455,000	$ -	$ -	$ -	$ -
1.7	SCADA and PLC Upgrades	$ 474,000	$ -	$ -	$ 474,000	$ -	$ -
1.8	Convert Disinfection from Gas to Liquid Chlorine	$ 707,000	$ 85,000	$ 622,000	$ -	$ -	$ -
Total Capital Costs		**$ 7,090,000**	**$ 2,019,000**	**$ 1,934,000**	**$ 2,827,000**	**$ 310,000**	**$ -**

9.6. SUSTAINABILITY CONSIDERATIONS

9.6.1. Water & Energy Efficiency

The North Lake Recreational Sewer and Water District is making improvements to management-based sustainability initiative efforts, including plans to implement a capital budget that is funded and supported by a CIP (accomplished with this Facility Plan), and implement sustainable use of biosolids. This is forthcoming and will be implemented following the upgrade to their treatment facility. Software will be selected during the design and construction phase of the project.

9.6.2. Green Infrastructure

Improvements to headworks biosolids handling and dewatering at the District's wastewater treatment plant will be addressed with the WWTP upgrade project. Improvements may include energy efficient building design and reduced energy expenditure for biosolids disposal.

9.6.3. Green Project Reserve (GPR)

Technology based sustainability initiative efforts that are anticipated to be addressed with this project include:

- High-efficiency lighting/lighting controls at the WWTP headworks and dewatering building and with onsite WWTP lighting.
- VFD pumps at the WWTP.
- Energy efficient motors that meet National Electrical Manufacturers Association (NEMA) Premium specification.
- Aeration improvements, such as energy efficient VFD blowers
- SCADA system installation at the WWTP.

9.7. OPERATOR AND STAFFING REQUIREMENTS

Currently, the District's existing collection system and WWTP are classified as Class 4 facilities. There is no anticipated need for additional license classes upon the completion of these improvements. With the addition of multiple processes, the operators will need to be trained to operate the new equipment. Additional staffing for the new solids handling system will be required when that project is completed. It is recommended that the District monitor staffing needs as additional staff may be necessary during the planning period.

9.8. FUNDING ALTERNATIVES

Many of the CIP projects will be funded by development as growth occurs and new facilities are needed to meet increasing demands. Methods of funding are available should the District choose to investigate, including the following:

9.8.1. Cash Funding

The District could consider raising rates to cash finance the improvements. This would require the least total cash outlay; however, the rates would be higher than if they were spread out over a long-term loan, which could be a significant hardship.

9.8.2. Idaho Department of Environmental Quality (State Revolving Fund (SRF))

The SRF program is funded by a combination of repayment of loans previously made by DEQ and grant money supplied by EPA. Owners of public wastewater systems can apply for SRF funds annually through a competitive application process. Applications are ranked by state officials based on need, sustainability, water quality improvements, and other criteria. Davis-Bacon Wage Act and Build America, Buy America (BABA) requirements will apply. Applicants may qualify for principal forgiveness or other subsidy programs. DEQ is required to commit a significant percentage of available loan funds to sustainable, energy efficient, and "green" infrastructure improvements. Consequently, elements that meet the "green" infrastructure qualifications may receive priority for funding. Voter approval in a bond election or through judicial confirmation is required for this funding source.

9.8.3. Idaho Department of Commerce and Community Development Block Grants (CDBG)

The Idaho Department of Commerce offers several grant programs for public wastewater system improvements. Eligibility for these funds is dependent on economic development. Grants up to $500,000 are available through community programs. Applicants must secure the services of a certified grant administrator to administer grant money and follow other grant requirements. There is an annual application window for applying for these funds.

9.8.4. United States Department of Agriculture-Rural Development (USDA-RD)

USDA-RD offers a grant and loan program for improvements to wastewater systems that serve rural communities which are defined as systems that serve less than 10,000 people. Grants up to 45% of the project cost are eligible depending on user rates. Applicants can apply for USDA-RD funds anytime during the year. Funds have many program requirements including the completion of a short-lived asset inventory, approved engineering report, and others. Voter approval in a bond election or through judicial confirmation and interim financing are required with this funding source.

9.8.5. United States Army Corps of Engineers (Section 595)

The USACE can sometimes offer money for water-related infrastructure projects to supplement funding from DEQ or USDA-RD. Funding availability depends on an appropriation from Congress and varies from year to year. Costs are shared with a 25 percent local match required.

9.8.6. Idaho Bond Bank

A bond bank is a state level entity which lends money to local governments within the state, with the goal of providing funds for their infrastructure needs and access to the capital markets at competitive interest rates. Under the Idaho Bond Bank program "IBBA", a municipality obtains a loan from the Bond Bank secured by either the municipality's bond or a loan agreement with the Bond Bank. The Bond Bank pools several loans to municipalities into one bond issue. The municipalities then repay the loan, and those repayments are used to repay the revenue bonds. The Bond Bank can obtain better credit ratings, more attractive interest rates, and lower underwriting costs than municipalities could achieve individually. The Bond Bank is able to pledge certain state funds as additional security for its bonds, further reducing interest costs. Additionally, the Idaho Bond Bank Authority can open doors to municipalities that were previously barred from the capital markets due to the high costs of financing or challenging credit situations.

9.8.7. Local & Private

In addition to federal and state funding programs, there are local and private funding sources available to communities to fund. Some of these include a local improvement district (LID), the municipal bond market with voter approval or judicial confirmation, a business improvement district (BID), urban renewal district, connection fees, development agreements with developers, and others.

9.9. ANNUAL BUDGET CONSIDERATION UPDATES

In November 2020 Keller Associates completed a user rate study to make recommendations for sewer rate increases that would address the requirements of the District (Appendix H). The District anticipates a combination of developer funded and District funded projects and the rate study will be revisited annually.

KELLER ASSOCIATES

100 E Bower St., Suite 110 | Meridian, ID 83642 | (208) 288-1992

APPENDIX A

Reuse Permit No. LA-000070-04

A. Permit Certificate

MUNICIPAL
WASTEWATER REUSE PERMIT
LA-000070-04

North Lake Recreational Sewer & Water District, P.O. Box 729, Donnelly, Idaho 83615 WITH FACILITIES IN **Township 16 North, Range 3 East, Section 9 (Rapid Infiltration Site) and Section 15 (Wastewater Treatment Facilities and Slow Rate Application Sites)** IS HEREBY AUTHORIZED TO CONSTRUCT, INSTALL, AND OPERATE A WASTEWATER REUSE SYSTEM IN ACCORDANCE WITH THE WASTEWATER REUSE RULES (IDAPA 58.01.17) AND THE WASTEWATER RULES (IDAPA 58.01.16), THE GROUND WATER QUALITY RULE (IDAPA 58.01.11), AND ACCOMPANYING PERMIT, APPENDICES, AND REFERENCE DOCUMENTS. THIS PERMIT IS EFFECTIVE FROM THE DATE OF SIGNATURE AND EXPIRES ON **DECEMBER 20, 2015**.

Pete Wagner
Boise Regional Office Administrator

12/20/2010
Date

DEPARTMENT OF ENVIRONMENTAL QUALITY
Boise Regional Office
1445 N. Orchard
Boise, ID 83706-2239
(208) 373-0550

POSTING ON SITE RECOMMENDED

B. Permit Contents, Appendices, and Reference Documents

Appendices

1. Environmental Monitoring Serial Numbers
2. Site Maps

References

1. Plan of Operation (Operation and Maintenance Manual) for Slow Rate System
2. Plan of Operation (Operation and Maintenance Manual) for Rapid Infiltration System
3. Waste Solids Management Plan – CA-070-03
4. Grazing Management Plan (contained in Permit Application, Appendix E)

The Sections, Appendices, and Reference Documents listed on this page are all elements of Wastewater Reuse Permit LA-000070-04 and are enforceable as such. This permit does not relieve North Lake Recreational Sewer & Water District, hereafter referred to as the permittee, from responsibility for compliance with other applicable federal, state or local laws, rules, standards or ordinances.

C. Abbreviations, Definitions

BMP or BMPs	Best Management Practices
BOD or COD	Biological or Chemical Oxygen Demand
DEQ or the Department	Idaho Department of Environmental Quality
Director	Director of the Idaho Department of Environmental Quality, or the Directors Designee, i.e. Regional Administrator
GS	Growing Season – May 1 through October 15 (168 days).
GW	Ground Water
GWQR	IDAPA 58.01.11 "Ground Water Quality Rule"
Handbook or Guidelines	"Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater ", on DEQ website: http://www.deq.idaho.gov/water/permits_forms/permitting/guidance.cfm
HLRgs	Growing Season Hydraulic Loading Rate. Includes any combination of wastewater and supplemental irrigation water applied to land application hydraulic management units during the growing season. The HLRgs limit is specified in Section F. Permit Limits and Conditions.
HLRngs	Non-Growing Season Hydraulic Loading Rate. Includes any combination of wastewater and supplemental irrigation water applied to each hydraulic management unit during the non-growing season. The HLRngs limit is specified in Section F. Permit Limits and Conditions.
HMU	Hydraulic Management Unit (Serial Number designation is MU)
IWR	Irrigation Water Requirement – Any combination of wastewater and supplemental irrigation water applied at rates commensurate to the moisture requirements of the crop, and calculated monthly during the growing season (GS). Calculation methodology for the IWR can be found at the following website: http://www.kimberly.uidaho.edu/water/appndxet/index.shtml. The equation used to calculate the IWR at this website is: $IWR = (CU - P_e) / E_i$ CU is the monthly consumptive use for a given crop in a given climatic area. CU is synonymous with crop evapotranspiration P_e is the effective precipitation. CU minus Pe is synonymous with the net irrigation requirement (IR) E_i is the irrigation system efficiency. To obtain the gross irrigation water requirement (IWR), divide the IR by the irrigation system efficiency.
IDAPA	Idaho Administrative Procedures Act.
LG	Lagoon
lb/ac-day	Pounds (of constituent) per acre per day
MBR	Membrane Bio-Reactor
MG	Million Gallons (1 MG = 36.827 acre-inches)
MGA	Million Gallons Annually (per WRP Reporting Year)
NGS	Non-Growing Season – October 16 through April 30.
O&M manual	Operation and Maintenance Manual, also referred to as the Plan of Operation
RI	Rapid Infiltration
SMU	Soil Monitoring Unit (Serial Number designation is SU)
TDS	Total Dissolved Solids or Total Filterable Residue
Typical Crop Uptake	The median constituent crop uptake from the three (3) most recent years the crop has been grown. Typical Crop Uptake is determined for each hydraulic management unit. For new crops having less than three years of on-site crop uptake data, regional crop yield data and typical nutrient content values, or other values approved by DEQ may be used.
WRP	Wastewater Reuse Permit (or Program)
WRP Reporting Year	The reporting year begins with the non-growing season and extends through the growing season of the following year, typically November 1 through October 31. For example, the 2000 Reporting Year was November 1, 1999 through October 31, 2000.
WW	Wastewater applied to the land application treatment site

D. Facility Information

Legal Name of Permittee	North Lake Recreational Sewer & Water District (District)
Type of Wastewater	Class C Municipal Wastewater
Method of Treatment	• Slow rate system: Lagoon treatment, chlorine disinfection, and slow rate land application on private property owned by Eld and Stevens. • Rapid infiltration (RI) system: Membrane bioreactor (MBR) system, enhanced phosphorus removal, ultraviolet disinfection, and discharge to RI basin system or the lagoon system.
Type of Facility	Public
Facility Location	• Lagoon treatment and slow rate land application sites located on west side of Eld Lane, southwest of the City of Donnelly. • RI basin site located on the east side of Norwood Road between Nisula and West Roseberry Roads on the west side of the Lake Fork arm of Cascade Lake.
Legal Location	• Wastewater Treatment Facilities and Slow Rate Application Sites: Township 16N, Range 3E, Section 15 • RI Site: Township 16N, Range 3E, Section 9
County	Valley
USGS Quad	Donnelly
Soils on Site	• Slow Rate Sites: Donnel sandy loam, Melton loam, Roseberry coarse sandy loam • RI Site: Donnel sand loam, Kangas fine gravelly loamy coarse sand
Depth to Ground Water	• Slow Rate Sites: Depth to seasonal high ground water is 1 to 4 feet, depth to regional aquifer is approximately 100 feet. • RI Site: Depth to seasonal high ground water is 3 to 25 feet, depth of unconfined aquifer system 244 feet or less, confined aquifer deeper than 244 feet.
Beneficial Uses of Ground Water	Agriculture, Domestic
Nearest Surface Water	• Slow Rate Sites: Lake Fork arm of Cascade Lake, Boulder Creek, un-named drainage runs through site • RI Site: Mud Creek, Lake Fork arm of Cascade Lake
Beneficial Uses of Surface Water	Agricultural Water Supply, Wildlife Habitat, Industrial Water Supply, Primary Contact Recreation, Cold Water Aquatic Life, Salmonid Spawning
Facility Contact **Mailing Address** **Phone**	Ronald Zarbnisky, District Chairman (Responsible Official) Bill Eddy, District Manager (Facility Contact) 435 South Eld Lane, P.O. Box 729, Donnelly, Idaho 83615 (208) 325-8958

E. Compliance Schedule for Required Activities

The Activities in the following table shall be completed on or before the Completion Date unless modified by the Department in writing.

Compliance Activity Number **Completion Date**	**Compliance Activity Description**
CA-070-01 **District Agreement for Stevens Property** Draft for review due prior to January 1, 2013	Submit for DEQ review and approval, a draft version of the renewal Agreement with the property owner for the slow rate application system on the Stevens property. The Agreement shall be revised as necessary to make it consistent with the requirements of this permit. A copy of the final, executed Agreement shall be submitted to DEQ within 30 days of the execution date.
CA-070-02 **Waste Solids Management Plan** Prior to removal of any solids off site	Submit a Waste Solids Management Plan for the treatment and disposal of biosolids from the wastewater treatment facilities for DEQ review and approval. The Plan shall describe how waste solids generated by the wastewater treatment system (lagoon sludge and MBR generated sludge) will be treated and disposed of to meet the requirements of Item No. 5 in Section I of this permit and EPA regulation 40 CFR 503.
CA-070-03 **Flow Rate Monitoring** Six (6) months after permit issuance	Install effluent flow measuring devices for the slow rate system to determine the volume of effluent discharged to each hydraulic management unit (HMU). Reporting of the volume of supplemental irrigation water applied to each HMU is also required, but may be based on pump curves and run time if the calculation procedures are submitted to and approved by DEQ.
CA-070-04 **Runoff Management Plan** As specified	1. No runoff is allowed from any site or fields used for wastewater slow rate irrigation, except after a 25-year, 24-hour storm event or greater. The permittee shall evaluate the Eld and Stevens properties for compliance with this requirement and submit the evaluation to DEQ for review and approval. Complete within six (6) months of permit issuance. 2. If evaluation in Item No. 1 finds that the slow rate fields are not in compliance with the runoff prevention criteria, the permittee shall submit plans for the construction of control structures and other BMPs to contain the design storm event for DEQ review and approval. Complete within six (6) months of determination in Item No. 1. 3. Complete installation of runoff prevention facilities approved by DEQ in Item No. 2. Complete within six (6) months of DEQ approval date.

E. Compliance Schedule for Required Activities

Compliance Activity Number **Completion Date**	**Compliance Activity Description**
CA-070-05 **Cells 1-4 Seepage Test** Seepage Testing Protocol due January 1, 2013 Testing completed prior to December 2013	Submit a Seepage Testing Protocol that defines the approach and testing procedures to be used to conduct seepage testing on Lagoon Cells 1, 2, 3 and 4. The protocol shall be based upon methods approved for use by DEQ. Upon approval of the protocol, conduct testing in accordance with the approved protocol and submit results for DEQ review. The performance standard is 0.25 inches per day. If a properly tested lagoon leaks more than 0.25 inches per day, the permittee shall either 1) submit a plan and schedule to either retest, repair, replace or decommission structures not meeting this standard, or 2) develop a plan based on ground water sampling and analyses and/or modeling to determine the effect of the lagoon leakage on the local ground water. If actual or predicted impacts do not comply with IDAPA 58.01.11 as determined by DEQ, the permittee shall comply with 1) above.

F. Permit Limits and Conditions

The permittee is allowed to reuse reclaimed wastewater at locations prescribed in the tables below and in accordance with all other applicable permit conditions and schedules.

Category	Permit Limits and Conditions	
	Slow Rate System	**Rapid Infiltration System**
Type of Wastewater	Class C Municipal Wastewater	Class C Municipal Wastewater
Application Site Area	• Eld Field 1: 104 acres • Stevens Field 2: 65 acres	• Rapid Infiltration (RI) Site No. 1
Application Season	May 1 through October 15	Year-round
Reporting Year for Annual Report	January 1 through December 31	January 1 through December 31
Maximum Application Volume of Water, each HMU	The Growing Season (GS) Hydraulic Loading Rate shall generally follow the Irrigation Water Requirement (IWR) using data from the tables contained in the following University of Idaho web site: http://www.kimberly.uidaho.edu/water/appndxet/index.shtml. IWR is equal to the Mean IR data from these tables divided by the irrigation system efficiency. In lieu of these tables, current climatic and evaporation data, or 30-year average data may be used to calculate the IWR, as defined in the Guidelines. **This limit applies to reclaimed wastewater and supplemental irrigation water, if used.** **Non-growing season (NGS) application of water is not allowed.**	No limit
Maximum Nitrogen Loading Rate, pounds/acre-year, each HMU	150% of typical crop uptake from all sources including manure from grazing and supplemental fertilizers, or UI Fertility Guide – combined total for Growing and Non-Growing Season.	Not applicable
Maximum COD Loading, Growing Season Average in pounds/acre-day, each HMU	50 pounds/acre-day	Not applicable

F. Permit Limits and Conditions

Category	Permit Limits and Conditions	
	Slow Rate System	**Rapid Infiltration System**
Effluent, Total Nitrogen, mg/L	No limit	10 mg/L or less
Effluent, Total Phosphorus, kg/month	No limit	8.3 kg/month or less, based on the average monthly phosphorus concentration in the effluent
Effluent, Total Suspended Solids, mg/L	No limit	100 mg/L or less, as a 30-day average concentration
Buffer Zones	The following minimum distances shall be provided between the buffer objects listed below and reclaimed wastewater reuse areas: Homes: 300 feet Areas of Public Access: 50 feet Domestic Water Wells: 500 feet Municipal Water Wells: 1,000 feet Natural Surface water: 100 feet Irrigation ditches/canals: 50 feet	The following minimum distances shall be provided between the buffer objects listed below and the perimeter of the RI basin site: Domestic Water Wells: 500 feet Municipal Water Wells: 1,000 feet
Grazing Requirements	Grazing shall be managed in accordance with the DEQ-approved grazing management plan.	Not allowed.

Category	Permit Limits and Conditions Applicable to both the Slow Rate System and the Rapid Infiltration System
Wastewater Treatment System Effluent, Total Coliform Limit	The median number of total coliform organisms shall not exceed 23 per 100 milliliters, as determined from the results of the last five (5) days for which analyses have been completed. In addition, the number of total coliform organisms shall not exceed 230 per 100 milliliters in any confirmed sample.
Posting/Restricting Access	• Fencing is required around the perimeter of the land application sites and the RI Basin site. • Warning signs stating "Reclaimed Wastewater Facility, Do Not Drink" or equivalent every 500 feet around the perimeter of the land application sites and the RI Basin site.
Wastewater Treatment and Reuse System Operation	The wastewater treatment facilities and reuse systems shall be operated by personnel certified and licensed in the State of Idaho wastewater operator training program at the operator class level specified in IDAPA 58.01.16.203 of the *Wastewater Rules*, and properly trained to operate and maintain the system. Operation of the wastewater treatment system shall be monitored on a 24-hour basis for alarm conditions, including notification of the qualified operating personnel under alarm conditions.

F. Permit Limits and Conditions

Category	Permit Limits and Conditions Applicable to both the Slow Rate System and the Rapid Infiltration System
Waste Solids Management Plan	Waste solids shall be managed in accordance with the DEQ-approved Waste Solids Management Plan. See Compliance Activity CA-070-03 in Section E of this WRP.
Odor Management	The wastewater treatment plant, reuse facilities, and other operations associated with the facility shall not create a public health hazard or nuisance conditions, including odors.
Construction Plans	Prior to construction or modification of facilities associated with the wastewater treatment or reuse systems, plans and specifications shall be submitted to DEQ for review and approval. Within 30 days of completion of construction, the permittee shall submit as-built plans for review and approval.
Supplemental Irrigation Water Protection	For systems with reclaimed wastewater and fresh irrigation water interconnections, DEQ-approved backflow prevention devices are required for protection of fresh irrigation water sources.

G. Monitoring Requirements

1. The permittee shall monitor and measure parameters as stated in the Facility Monitoring Tables in this section. Unless otherwise agreed to in writing by the DEQ, data collected and submitted shall include, but not be limited to, the parameters and frequencies in the Facility Monitoring Tables.
2. Samples shall be collected at times and locations that represent typical environmental and process parameters being monitored.
3. Appropriate analytical methods, as approved by DEQ, shall be employed. An up-to-date description of sample collection methods, appropriate analytical methods, and QA/QC protocols shall be included in the Plan of Operation manual.
4. A Hydraulic Management Unit (HMU) is a pre-defined area or field(s) that, in as much as possible, have similar cropping practices, irrigation practices, and other management characteristics. The HMUs are defined in Appendix 1, "Environmental Monitoring Serial Numbers".
5. Ten (10) soil sample locations shall be selected for each Soil Monitoring Unit (SMU). Three (3) soil samples shall be collected at each sample location, one at 0-12 inches, one at 12-24 inches, and one at 24-36 inches. The soil samples collected at each depth shall be composited to yield three (3) samples for analysis from each soil monitoring unit.
6. The static water level in each ground water monitoring well shall be measured prior to purging and/or sampling ground water. Ground water monitoring wells shall be purged a minimum of three (3) casing volumes prior to obtaining a sample of ground water. Alternately, wells shall be continually purged until field measurements satisfy each of the following conditions: two consecutive temperature values measured at least five minutes apart are within one degree Celsius of each other, two consecutive pH measurements taken at least five minutes apart are within 0.2 units of each other, and two consecutive specific conductance values measured at least five minutes apart are within 10% of each other. Alternate procedures, such as low flow sampling, shall be submitted to DEQ for review and approval prior to implementation.
7. Annual reporting of monitoring requirements is described in Section H, Standard Reporting Requirements.
8. Monitoring locations are defined in Appendix 1, "Environmental Monitoring Serial Numbers".

Facility Monitoring Table, Slow Rate System

Frequency	Monitoring Point	Description and Type of Monitoring	Parameters
Influent Sewage			
Daily	Flow Meter	Sewer influent flow rate to lagoon system	Gallons per day
Reclaimed Wastewater			
Daily (when irrigating with reclaimed wastewater)	Flow Meter	Volume of Reclaimed Wastewater to slow rate irrigation	Gallon per day, gallons per month, and acre-inches/month applied, each HMU. See Note 4 above.
Weekly (each week when reclaimed wastewater is applied)	Following Disinfection Process	Grab Sample of Reclaimed Wastewater	Total Coliform

G. Monitoring Requirements

Frequency	Monitoring Point	Description and Type of Monitoring	Parameters
Monthly (each month when reclaimed wastewater is applied)	Following Disinfection Process	Grab Sample of Reclaimed Wastewater	Total Kjeldahl Nitrogen, Nitrate-Nitrogen, Total Phosphorus, Chemical Oxygen Demand
Supplemental Irrigation Water			
Daily (when using supplemental irrigation water)	Flow Meter or DEQ-approved equivalent	Volume of Supplemental Irrigation Water	Gallon per day, gallons per month, and acre-inches/month applied, each HMU
Ground Water			
Twice per year, April and October	Ground water monitoring wells GW-07001, 07002, 07003, and 07004	See Note 6 above.	Depth to Ground Water, Ground Water Elevation, Nitrate Nitrogen, Total Coliform, Total Phosphorus, Total Dissolved Solids, Chloride
Soil			
Annually (following completion of reclaimed wastewater application season)	Each SMU	Composite Soil Sample See Note 5 above.	Electrical Conductivity, Nitrate-N, Ammonium-N, pH, Plant Available Phosphorous Note: Use the Olsen method for soils with pH 6.5 or greater, use the Bray method if soil pH is less than 6.5
Miscellaneous Data and Calculations			
Annually	Each HMU	Acres used for the reuse of reclaimed wastewater	1. If all acres of a HMU are used, no site plan submittal is required. 2. If a portion of the HMU acreage is utilized, submit a site plan showing the areas used within the HMU and quantify the acres.
Annually	Each HMU	Calculate Irrigation Water Requirement	Volume (inches/acre and total gallons) for each month during application season.
Annually	Each HMU	Calculate total nitrogen loading from reclaimed wastewater	Pounds /acre-year
Annually	Each HMU	Calculate phosphorus loading from reclaimed wastewater	Pounds /acre-year
Annually	Each HMU	Calculate COD loading from reclaimed wastewater, growing season average	Pounds /acre-day
Annually	Each HMU	Calculate crop nitrogen and phosphorus removal	Total pounds/HMU and pounds/acre and provide basis for calculations

G. Monitoring Requirements

Frequency	Monitoring Point	Description and Type of Monitoring	Parameters
Annually	At Reclaimed Wastewater/ Supplemental Irrigation Water interconnections with the potential for contaminating the supplemental water supply	Backflow Prevention Device testing	Provide documentation of the testing of all backflow prevention devices.
Every two years, starting with first year of permit	Flow measurement devices	Calibration of flow meters used to measure flow rates to reuse areas.	Provide documentation for the calibration of all flow meters and pumps used directly or indirectly to measure all reclaimed wastewater and supplemental irrigation water flows applied to reuse areas.

Facility Monitoring Table, Rapid Infiltration System

Frequency	Monitoring Point	Description and Type of Monitoring	Parameters
Influent Sewage			
Daily	Flow Meter	Sewer influent flow rate to Membrane Bioreactor treatment system	Gallons per day
Reclaimed Wastewater System			
Daily	Flow Meter	Volume of Reclaimed Wastewater to rapid infiltration system	Gallons per day, rapid infiltration basin(s) used for discharge, total gallons per month
Daily	Flow Meter	Volume of Reclaimed Wastewater diverted	Gallons per day, diversion point, total gallons per year
Weekly, when producing reclaimed wastewater for delivery to RI Basins	Sample point following UV disinfection process	Grab Sample of Reclaimed Wastewater	Total Coliform, Total Phosphorus, Total Suspended Solids
Monthly	Sample point following UV disinfection process	Grab Sample of Reclaimed Wastewater	Total Kjeldahl Nitrogen, Nitrate - Nitrogen

G. Monitoring Requirements

Frequency	Monitoring Point	Description and Type of Monitoring	Parameters
Ground Water			
Monthly, for the twelve months after RI basins are put into operation	Ground water monitoring wells GW-07005, 07006, and 07007	See Note 6.	Depth to Ground Water, Ground Water Elevation, Nitrate Nitrogen, Total Coliform, Total Phosphorus, Total Dissolved Solids, Chloride
Quarterly, after initial monthly monitoring is completed	Ground water monitoring wells GW-07005, 07006, and 07007	See Note 6.	Depth to Ground Water, Ground Water Elevation, Nitrate Nitrogen, Total Coliform, Total Phosphorus, Total Dissolved Solids, Chloride
Miscellaneous Data and Calculations			
Annually	Each rapid infiltration basin (14 basins)	Calculation of volume of reclaimed wastewater to each basin	Gallons per year
Annually	Rapid infiltration system	Calculation of phosphorus mass discharged to the system	Mass of phosphorus per year
Every two years, starting with first year of permit	At flow measurement locations	Calibration of flow meter	Provide documentation for the calibration of the flow meter used to measure reclaimed wastewater production from the MBR system

H. Standard Reporting Requirements

1. The permittee shall submit an Annual Wastewater Reuse Site Performance Report ("Annual Report") prepared by a competent environmental professional no later than March 31 of each year which shall cover the previous year (see section F for reuse reporting period). The Annual Report shall include results for monitoring required in Section G, status of compliance activities, and an interpretive discussion of monitoring data (ground water, vadose zone, hydraulic loading, wastewater etc.) with particular respect to environmental impacts by the facility.

2. The annual report shall contain the results of the required monitoring as described in Section G. Monitoring Requirements. If the permittee monitors any parameter more frequently than required by this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the annual report.

3. The annual report shall be submitted to the Engineering Manager at the following address:

   Boise Regional Office
   1445 N. Orchard
   Boise, ID 83706-2239
   (208) 373-0550

4. Notice of completion of any work described in Section E. Compliance Schedule for Required Activities shall be submitted to the Department within 30 days of activity completion. The status of all other work described in Section E shall be submitted with the Annual Report.

5. All laboratory reports containing the sample results for monitoring required by Section G. Monitoring Requirements of this permit shall be submitted with the Annual Report.

I. Standard Permit Conditions: Procedures and Reporting

1. The permittee shall at all times properly maintain and operate all structures, systems, and equipment for treatment, operational controls and monitoring, which are installed or used by the permittee to comply with all conditions of the permit or the Wastewater Reuse Permit Regulations, in conformance with a DEQ approved, current Plan of Operations (Operations and Maintenance Manual) which describes in detail the operation, maintenance, and management of the wastewater treatment system. This Plan of Operations shall be updated as necessary to reflect current operations.

2. Wastewater(s) or recharge waters applied to the land surface must be restricted to the premises of the application site. Wastewater discharges to surface water that require a permit under the Clean Water Act must be authorized by the U.S. Environmental Protection Agency.

3. Wastewater must not create a public health hazard or nuisance condition as stated in IDAPA 58.01.16.600.03. In order to prevent public health hazards and nuisance conditions the permittee shall:

   a. Apply wastewater as evenly as practicable to the treatment area;
   b. Prevent organic solids (contained in the wastewater) from accumulating on the ground surface to the point where the solids putrefy or support vectors or insects; and
   c. Prevent wastewater from ponding in the fields to the point where the ponded wastewater putrefies or supports vectors or insects.

4. The permittee shall:

   a. Manage the wastewater reuse treatment site as an agronomic operation where vegetative cover is grown and harvested or grazed to utilize the nutrients and minerals in the wastewater, and,
   b. Not hydraulically overload any particular areas of the wastewater reuse treatment site.

5. All waste solids, including dredgings and sludges, shall be utilized or disposed in a manner which will prevent their entry, or the entry of contaminated drainage or leachate therefrom, into the waters of the state such that health hazards and nuisance conditions are not created; and to prevent impacts on designated beneficial uses of the ground water and surface water. The permittee's management of waste solids shall be governed by the terms of the DEQ approved Waste Solids Management Plan, which upon approval shall be an enforceable portion of this permit.

6. If the permittee intends to continue operation of the permitted facility after the expiration of an existing permit, the permittee shall apply for a new permit at least six months prior to the expiration date of the existing permit in accordance with the Wastewater Reuse Permit Regulations and include seepage tests on all lagoons per latest DEQ procedures.

7. The permittee shall allow the Director of the Idaho Department of Environmental Quality or the Director's designee (hereinafter referred to as Director), consistent with Title 39, Chapter 1, Idaho Code, to:

   a. Enter the permitted facility,
   b. Inspect any records that must be kept under the conditions of the permit.
   c. Inspect any facility, equipment, practice, or operation permitted or required by the permit.
   d. Sample or monitor for the purpose of assuring permit compliance, any substance or any parameter at the facility.

8. The permittee shall report to the Director under the circumstances and in the manner specified in this section:

   a. In writing thirty (30) days before any planned physical alteration or addition to the permitted facility or activity if that alteration or addition would result in any significant change in information that was submitted during the permit application process.
   b. In writing thirty (30) days before any anticipated change which would result in non-compliance with any permit condition or these regulations.

c. Orally within twenty-four (24) hours from the time the permittee became aware of any non-compliance which may endanger the public health or the environment at telephone numbers provided in the permit by the Director (see below)

DEQ Regional Office: see Permit Certification Page
Emergency 24 Hour Number 1-800-632-8000

d. In writing as soon as possible but within five (5) days of the date the permittee knows or should know of any non-compliance unless extended by the DEQ. This report shall contain:

   i. A description of the non-compliance and its cause;
   ii. The period of non-compliance including to the extent possible, times and dates and, if the non-compliance has not been corrected, the anticipated time it is expected to continue; and
   iii. Steps taken or planned to reduce or eliminate reoccurrence of the non-compliance.

e. In writing as soon as possible after the permittee becomes aware of relevant facts not submitted or incorrect information submitted, in a permit application or any report to the Director. Those facts or the correct information shall be included as a part of this report.

9. The permittee shall take all necessary actions to prevent or eliminate any adverse impact on the public health or the environment resulting from permit noncompliance.

10. The permittee shall determine (on an on-going basis) if any noxious weed problems relate to the permitted sites. If problems are present, coordinate with the Idaho Department of Agriculture or the local County authority regarding their requirements for noxious weed control. Also address these control operations in an update to the Operations and Maintenance Manual.

J. Standard Permit Conditions: Modifications, Violations, and Revocations

1. The permittee shall furnish to the Director within reasonable time, any information including copies of records, which may be requested by the Director to determine whether cause exists for modifying, revoking, re-issuing, or terminating the permit, or to determine compliance with the permit or these regulations.

2. Both minor and major modifications may be made to this permit as stated in IDAPA 58.01.17.700.01 and 02 with respect to any conditions stated in this permit upon review and approval of the DEQ.

3. Whenever a facility expansion, production increase or process modification is anticipated which will result in a change in the character of pollutants to be discharged or which will result in a new or increased discharge that will exceed the conditions of this permit, or if it is determined by the DEQ that the terms or conditions of the permit must be modified in order to adequately protect the public health or environment, a request for either major or minor modifications must be submitted together with the reports as described in I. *Standard Reporting Requirements*, and plans and specifications for the proposed changes. No such facility expansion, production increase or process modification shall be made until plans have been reviewed and approved by the DEQ and a new permit or permit modification has been issued.

4. Permits shall be transferable to a new owner or operator provided that the permittee notifies the Director by requesting a minor modification of the permit before the date of transfer.

5. Any person violating any provision of the Waste Water Reuse Permit Regulations, or any permit or order issued thereunder shall be liable for a civil penalty not to exceed ten thousand dollars ($10,000) or one thousand dollars ($1,000) for each day of a continuing violation, whichever is greater. In addition, pursuant to Title 39, Chapter 1, Idaho Code, any willful or negligent violation may constitute a misdemeanor.

6. The Director may revoke a permit if the permittee violates any permit condition or the Wastewater Reuse Permit Regulations.

7. Except in cases of emergency, the Director shall issue a written notice of intent to revoke to the permittee prior to final revocation. Revocation shall become final within thirty-five (35) days of receipt of the notice by the permittee, unless within that time the permittee request an administrative hearing in writing to the Board of the Department of Environmental Quality pursuant to the Rules of Administrative Procedures contained in IDAPA 58.01.23.

8. If, pursuant to Idaho Code 67-5247, the Director finds the public health, safety or welfare requires emergency action, the Director shall incorporate findings in support of such action in a written notice of emergency revocation issued to the permittee. Emergency revocation shall be effective upon receipt by the permittee. Thereafter, if requested by the permittee in writing, a revocation hearing before the Board of the Department of Environmental Quality shall be provided. Such hearings shall be conducted in accordance with the Rules of Administrative Procedures contained in IDAPA 58.01.23.

9. The provisions of this permit are severable and if a provision or its application is declared invalid or unenforceable for any reason, that declaration will not affect the validity or enforceability of the remaining provisions.

10. The permittee shall notify the DEQ at least six (6) months prior to permanently removing any permitted reuse facility from service, including any treatment, storage, or other facilities or equipment associated with the reuse site. Prior to commencing closure activities, the permittee shall: a) participate in a pre-site closure meeting with the DEQ; b) develop a site closure plan that identifies specific closure, site characterization, or cleanup tasks with scheduled task completion dates in accordance with agreements made at the pre-site closure meeting; and c) submit the completed site closure plan to the DEQ for review and approval within forty-five (45) days of the pre-site closure meeting. The permittee must complete the DEQ approved site closure plan.

Appendix 1
Environmental Monitoring Serial Numbers

HYDRAULIC MANAGEMENT UNITS

Serial Number	Description	Area (Acres)
MU-07001	Eld Field 1 (slow rate system)	104
MU-07002	Stevens Field 2 (slow rate system)	65
MU-07003	Rapid Infiltration Basins (14 cells)	NA

SOIL MONITORING UNITS

Serial Number	Description	Area (Acres)
SU-07001	Eld Field 1	104
SU-07002	Stevens Field 2	65

WASTEWATER SAMPLING POINTS

Serial Number	Description
WW-07001	Influent sewage to wastewater treatment systems
WW-07002	Disinfected effluent from lagoon treatment system
WW-07003	MBR effluent prior to disinfection
WW-07004	MBR effluent after disinfection

GROUND WATER MONITORING WELLS

Serial Number	Description	Location
GW-07001	MW-1, north boundary of Stevens Field 2	Upgradient well for Stevens property
GW-07002	MW-2, SW corner of Stevens Field 2	Downgradient well for Stevens property
GW-07003	MW-3, NE corner of Eld Field 1	Upgradient well for Eld property
GW-07004	MW-4, SW corner of Eld Field 1	Downgradient well for Eld property
GW-07005	MW-5, West of RI Basin site	Upgradient well for RI basin site
GW-07006	MW-6, East of RI Basin site	Downgradient well for RI basin site
GW-07007	MW-7, SE of RI Basin site	Downgradient well for RI basin site

LAGOONS

Serial Number	Description	Volume (MG)
LG-07001	Aerated Lagoon 1, Complete Mix	2.80
LG-07002	Aerated Lagoon 2, Complete Mix (aeration added in 2006)	1.40
LG-07003	Polishing Lagoon 3	1.54
LG-07004	Effluent Storage Lagoon 4	8.20
LG-07005	Effluent Storage Lagoon 5	52.6

Appendix 2
Site Maps

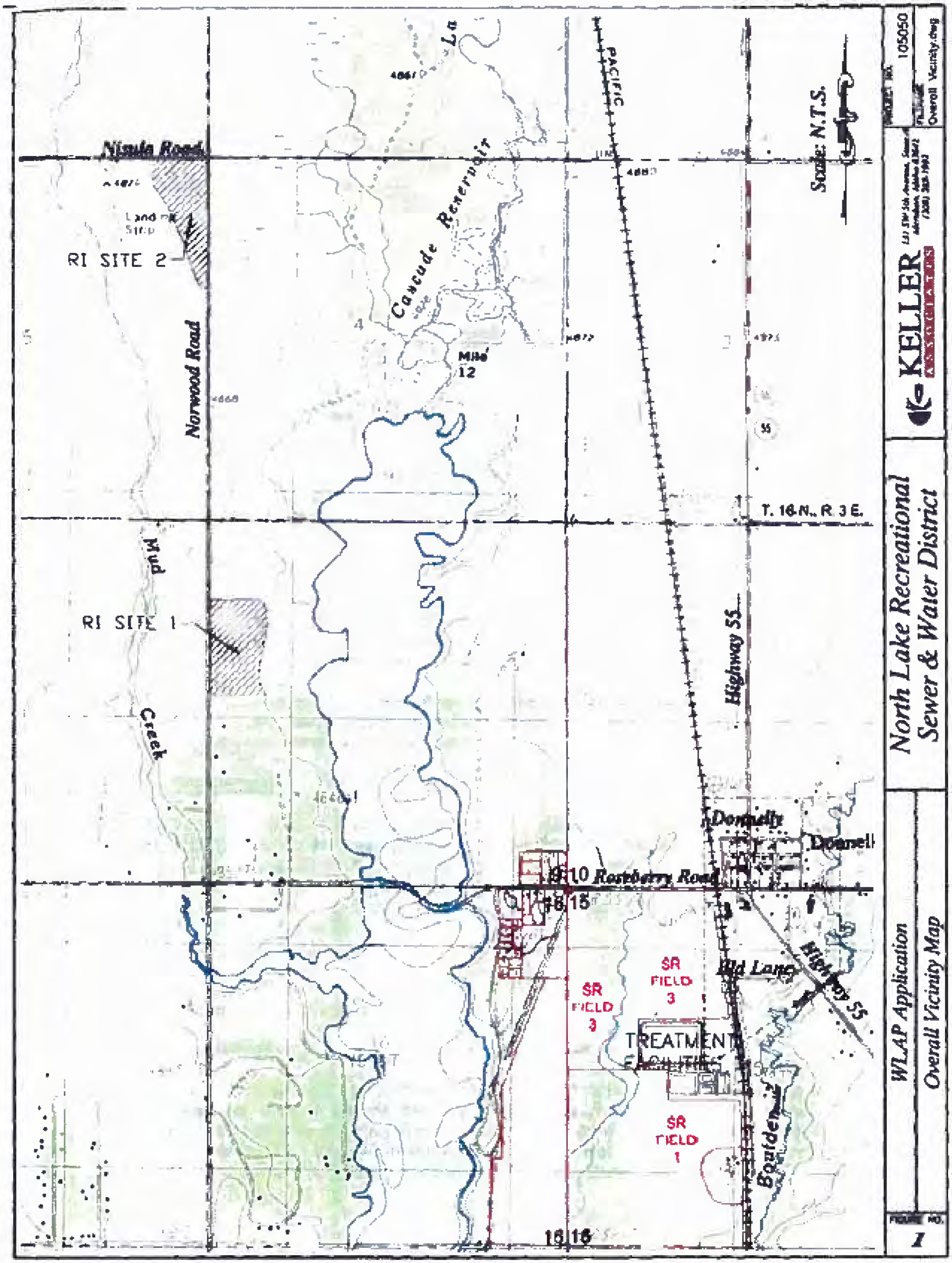


Figure A.1: Vicinity Map

Appendix 2
Site Maps

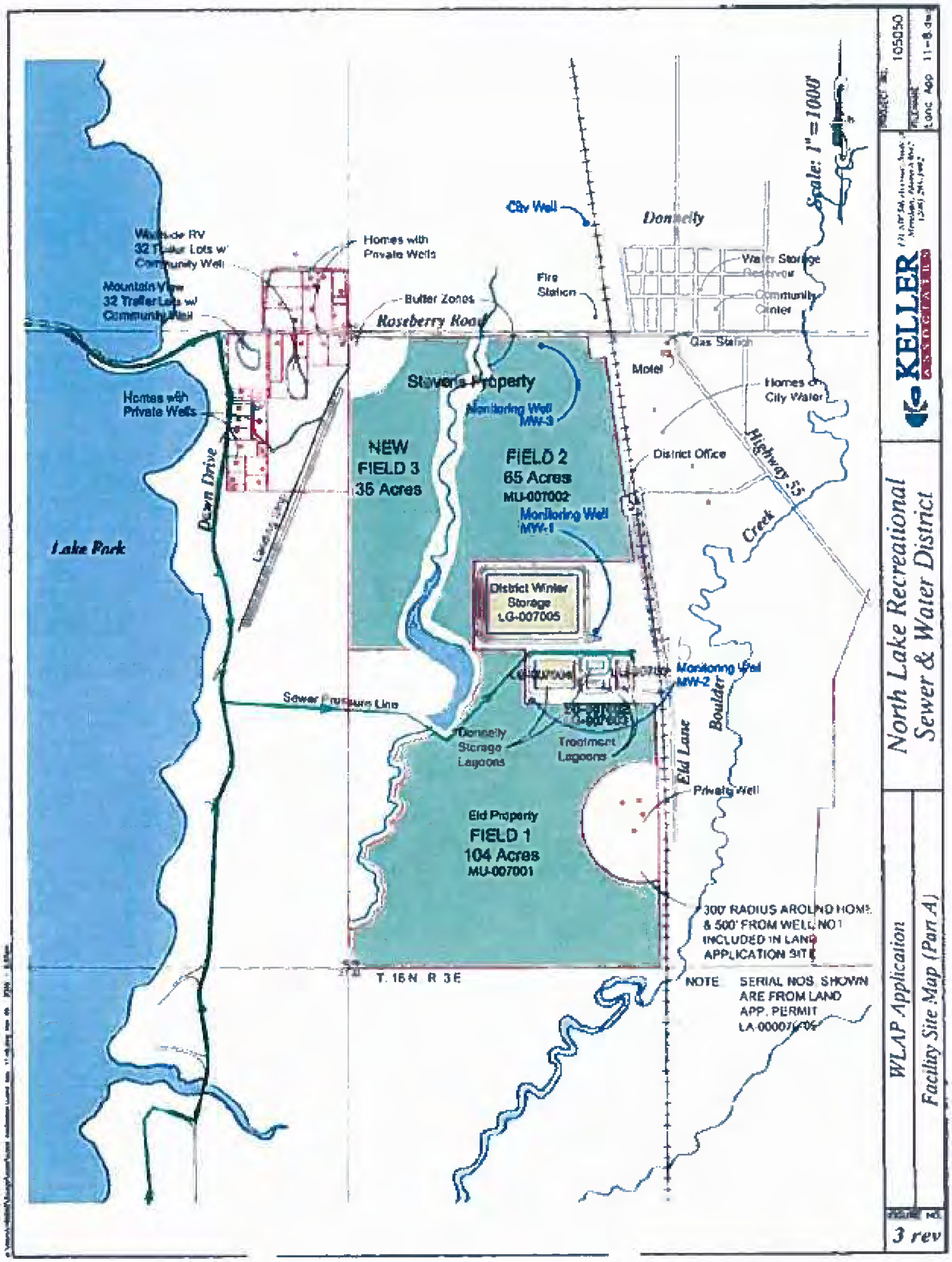


Figure A.2: Slow Rate Land Application Sites*
***Note: Field 3 is not currently permitted for use.**

Appendix 2
Site Maps

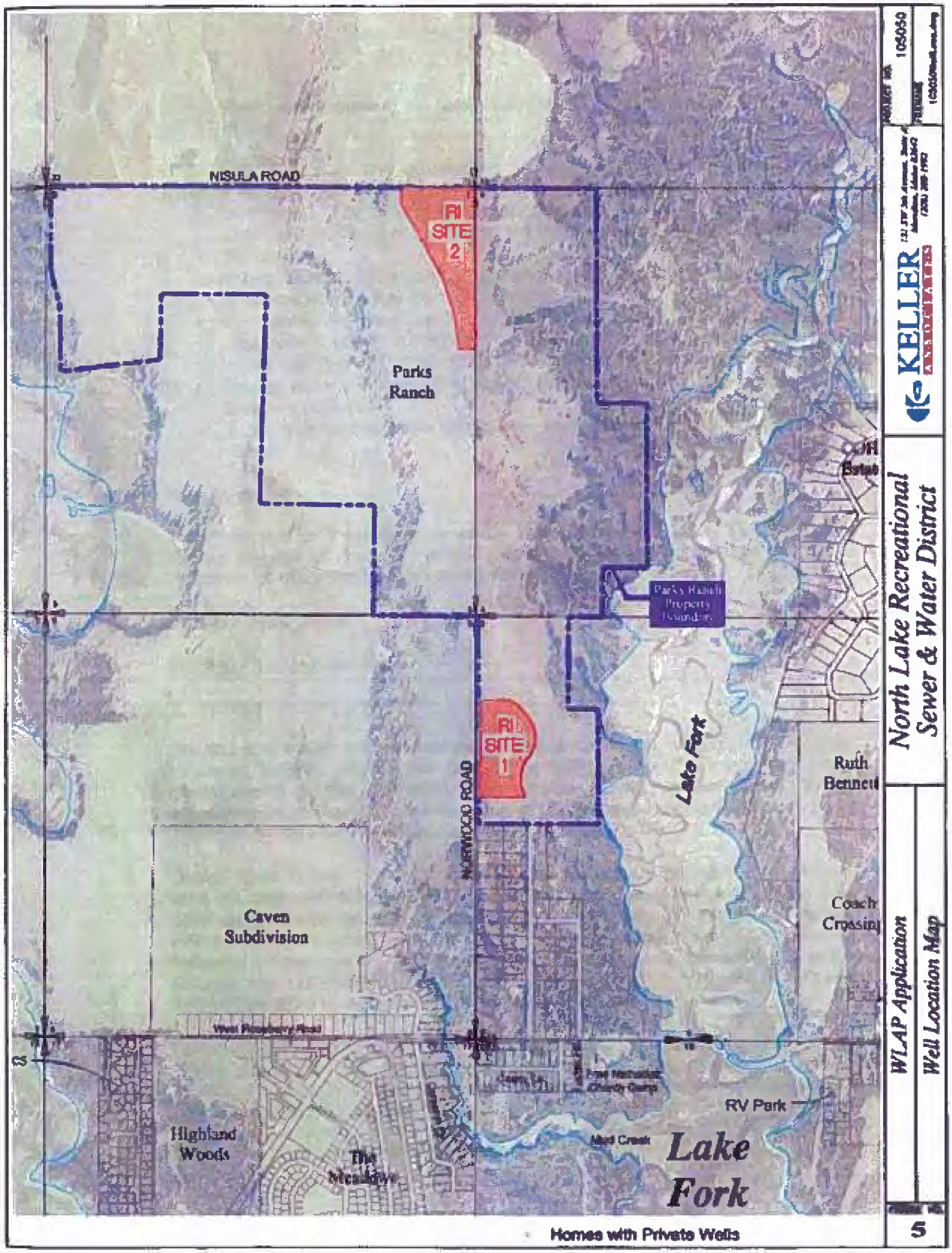
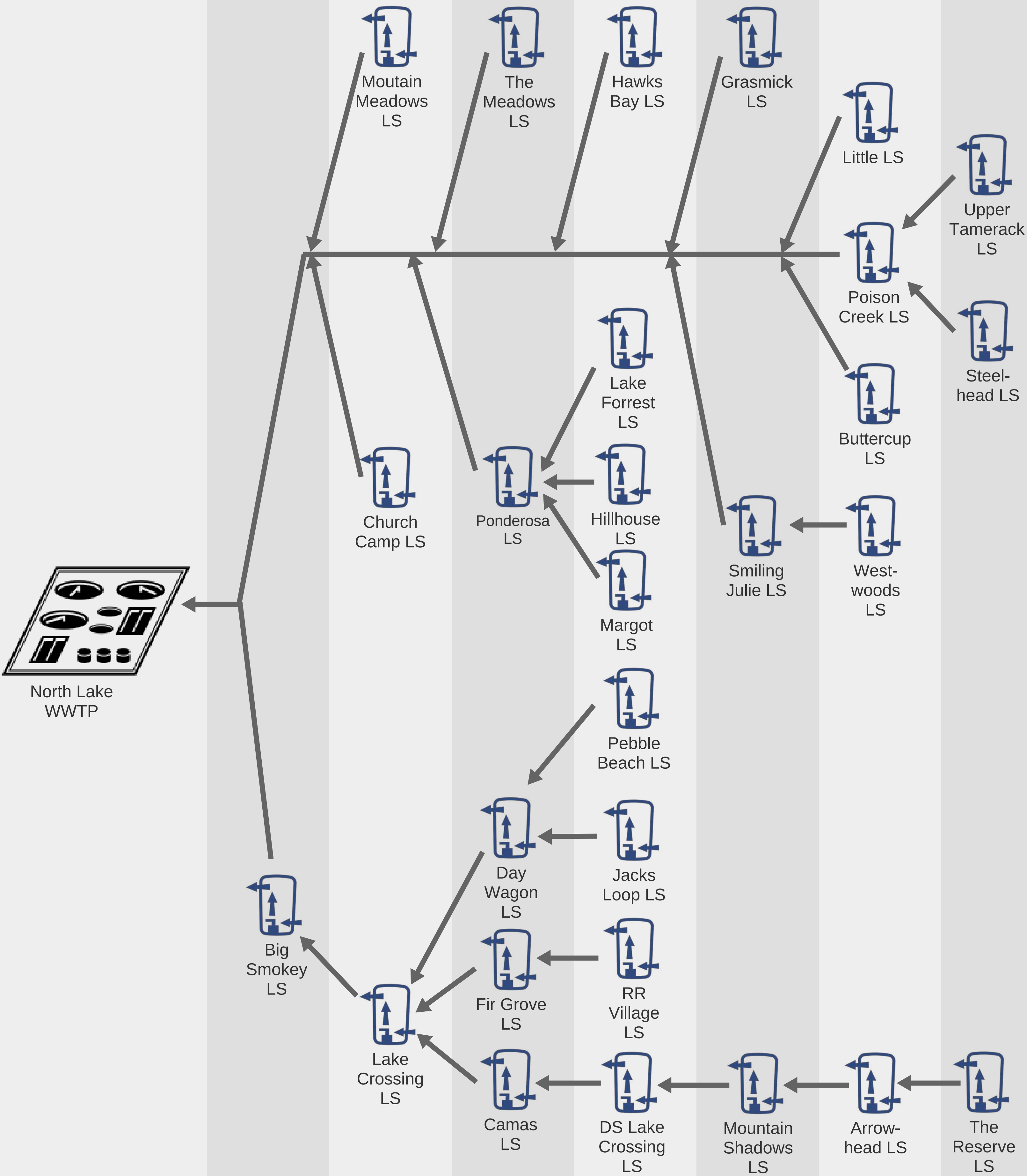


Figure A.3: Rapid Infiltration Basin Sites*
***Note: RI Site 2 is not currently permitted for use.**

APPENDIX B

Full Size Figures


Moutain Meadows LS
The Meadows LS
Hawks Bay LS
Grasmick LS
Little LS
Upper Tamerack LS
Poison Creek LS
Steel-head LS
Buttercup LS
Lake Forrest LS
Church Camp LS
Ponderosa LS
Hillhouse LS
Smiling Julie LS
West-woods LS
Margot LS
North Lake WWTP
Pebble Beach LS
Day Wagon LS
Jacks Loop LS
Big Smokey LS
Fir Grove LS
RR Village LS
Lake Crossing LS
Camas LS
DS Lake Crossing LS
Mountain Shadows LS
Arrow-head LS
The Reserve LS

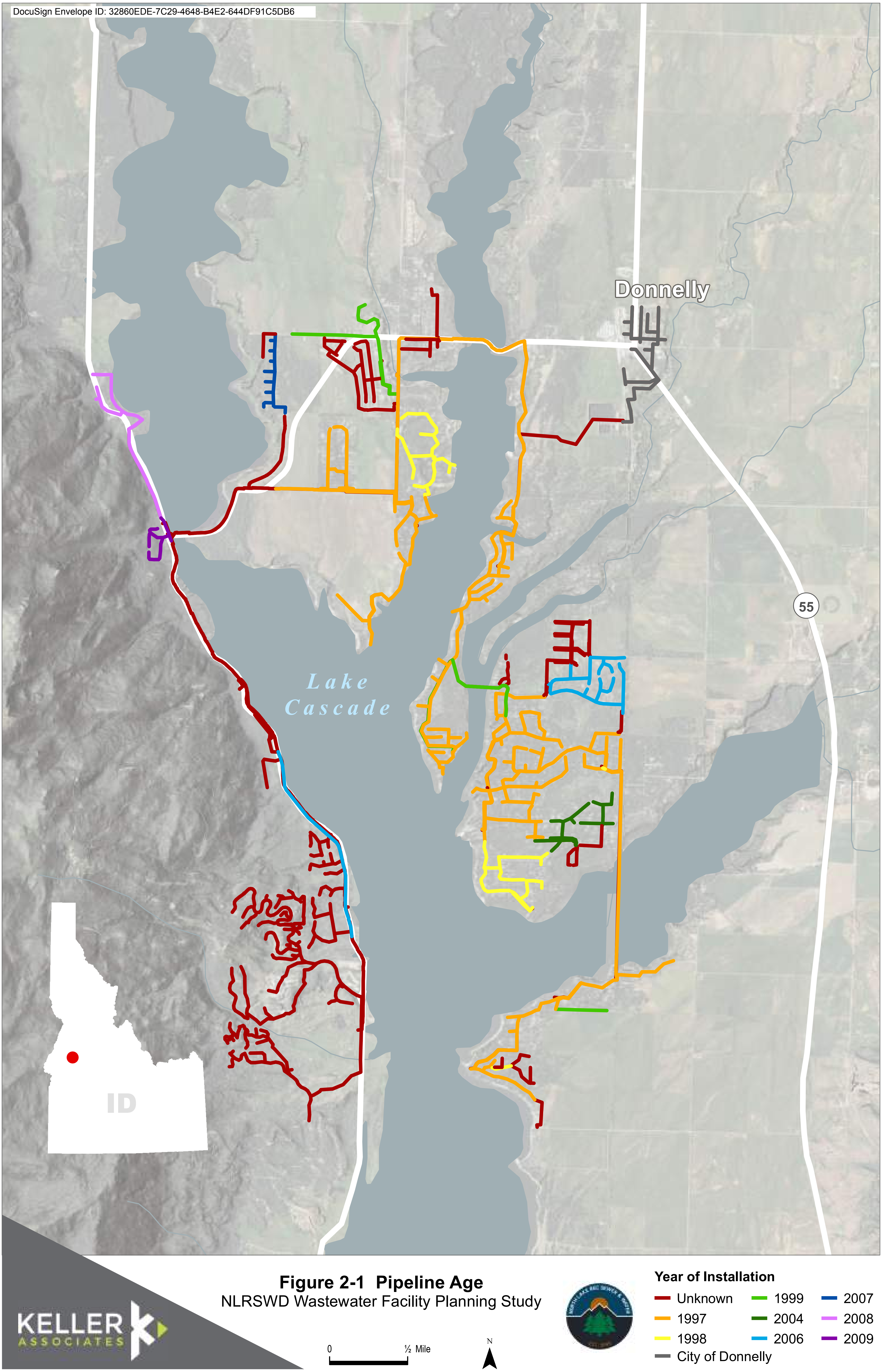


Figure 2-1 Pipeline Age
NLRSWD Wastewater Facility Planning Study

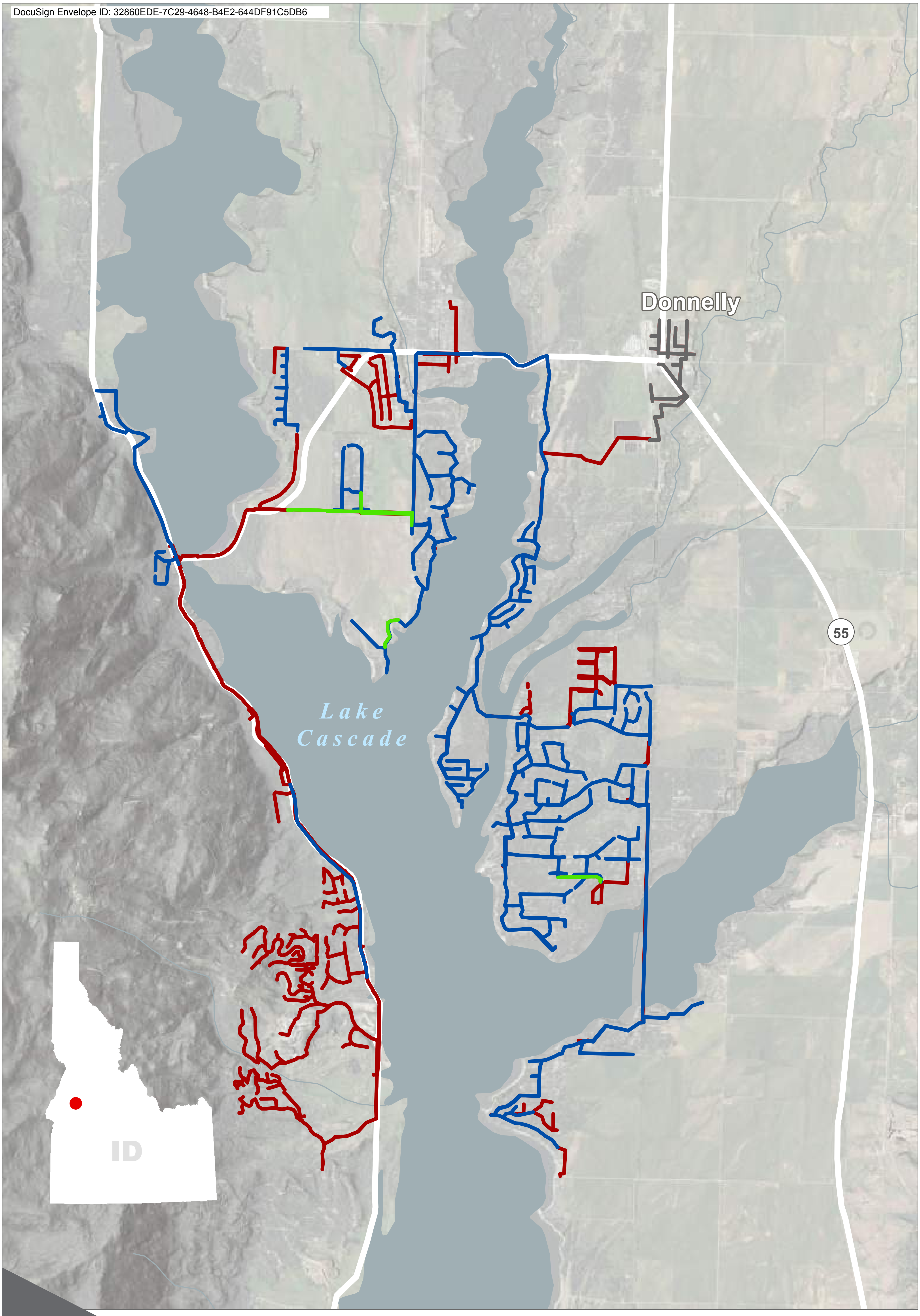


Figure 2-2 Pipeline Material
NLRSWD Wastewater Facility Planning Study

0 ½ Mile
N

Material
- Unknown
- DIP
- PVC
- City of Donnelly

KELLER ASSOCIATES

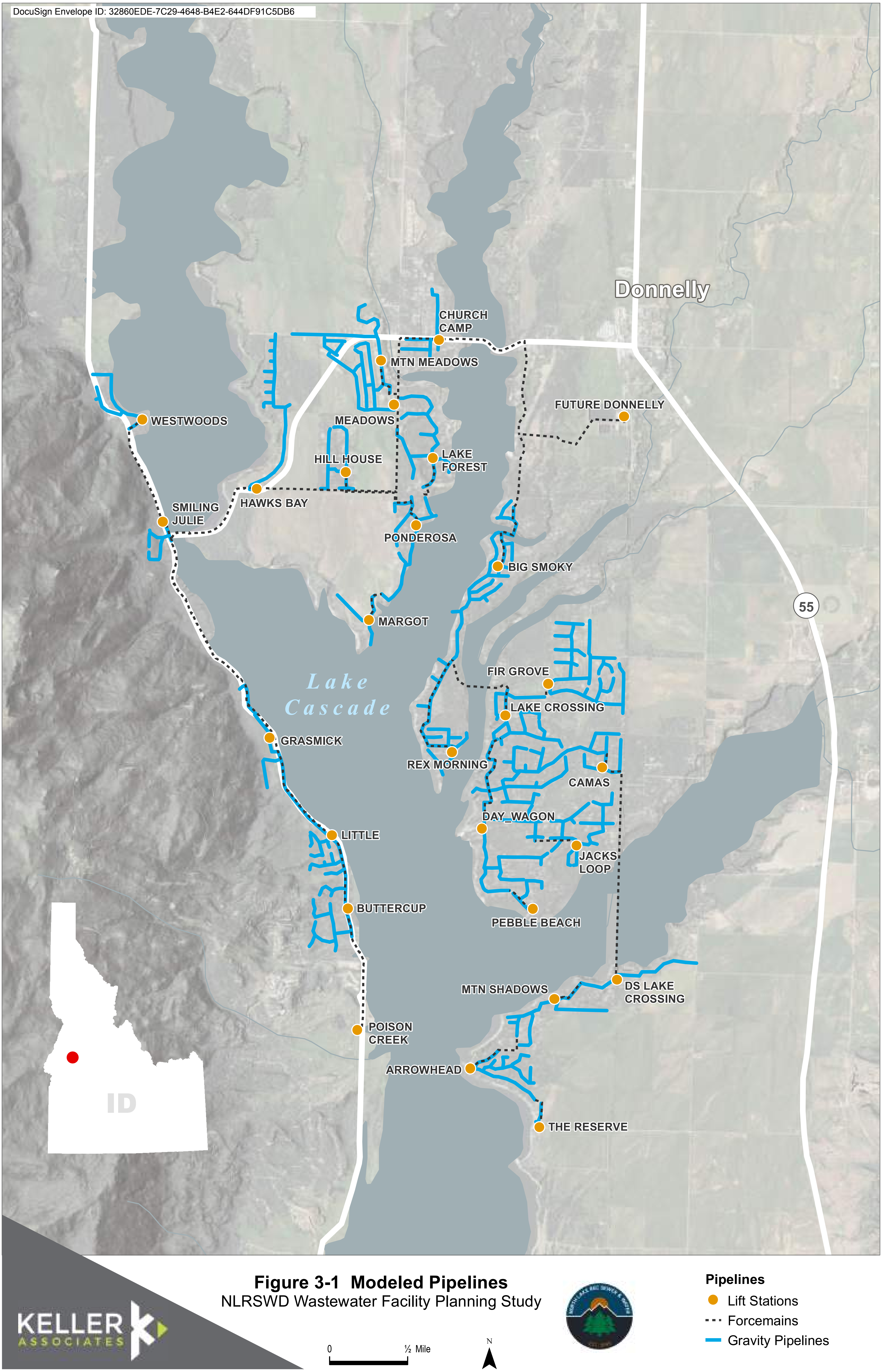


Figure 3-1 Modeled Pipelines
NLRSWD Wastewater Facility Planning Study

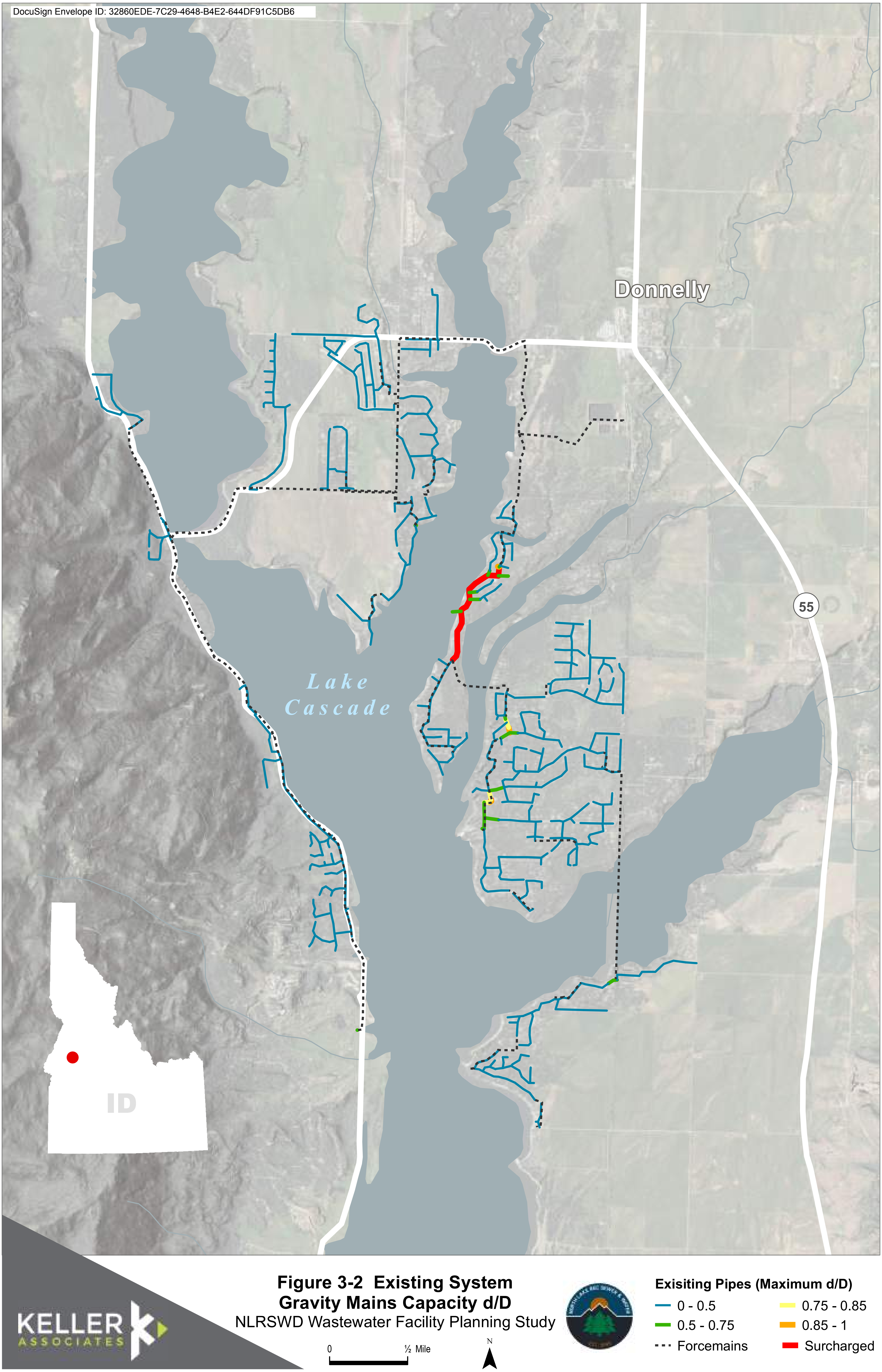


Figure 3-2 Existing System Gravity Mains Capacity d/D

NLRSWD Wastewater Facility Planning Study

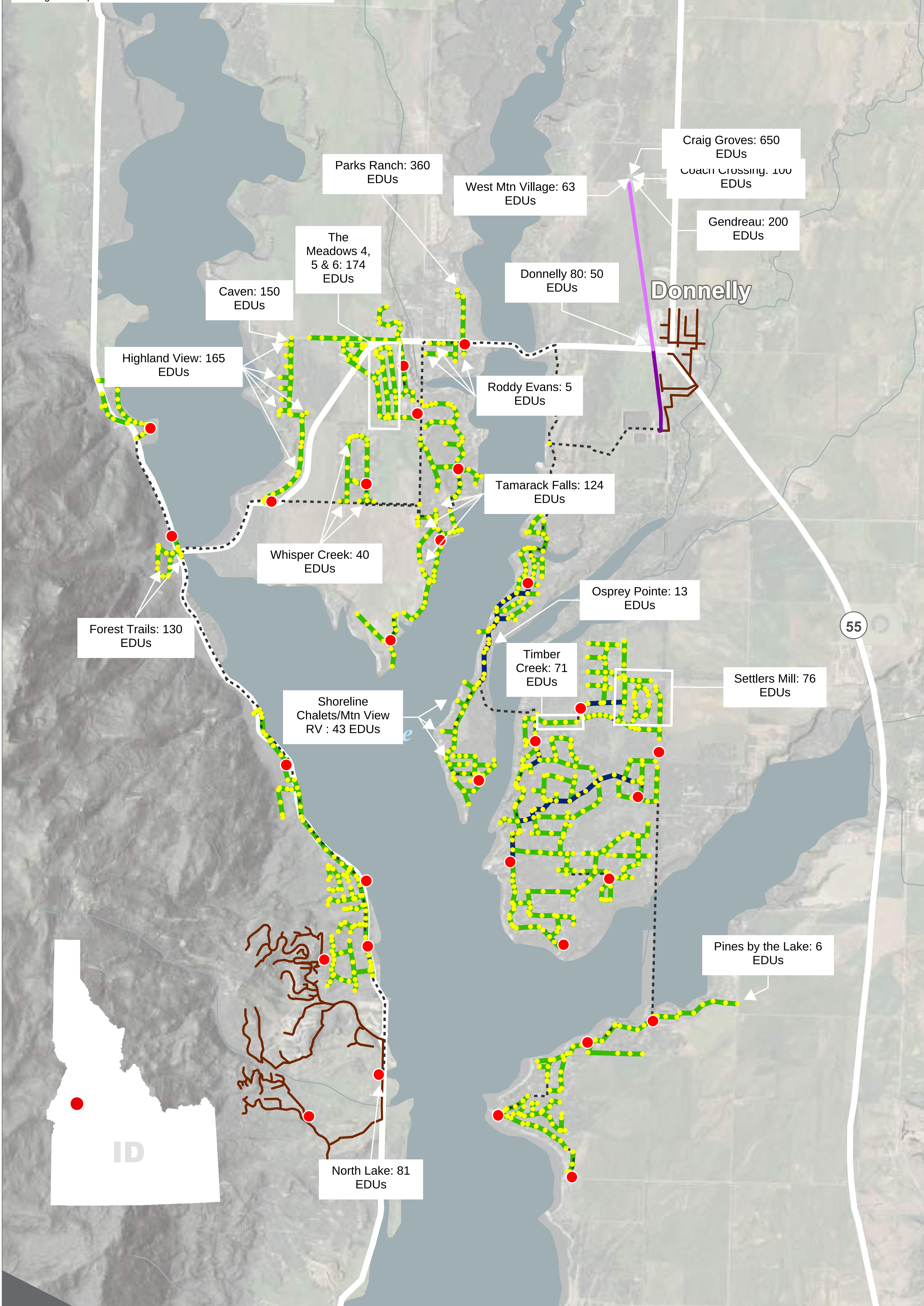


Figure 3-3 Commited Growth Areas
NLRSWD Wastewater Facility Planning Study

KELLER ASSOCIATES

0 ½ Mile

N

Pipelines
- 8"
- 10"
- 12"
- 18"
- Forcemains
- Private Pipeline
- Manhole
- Pump Station

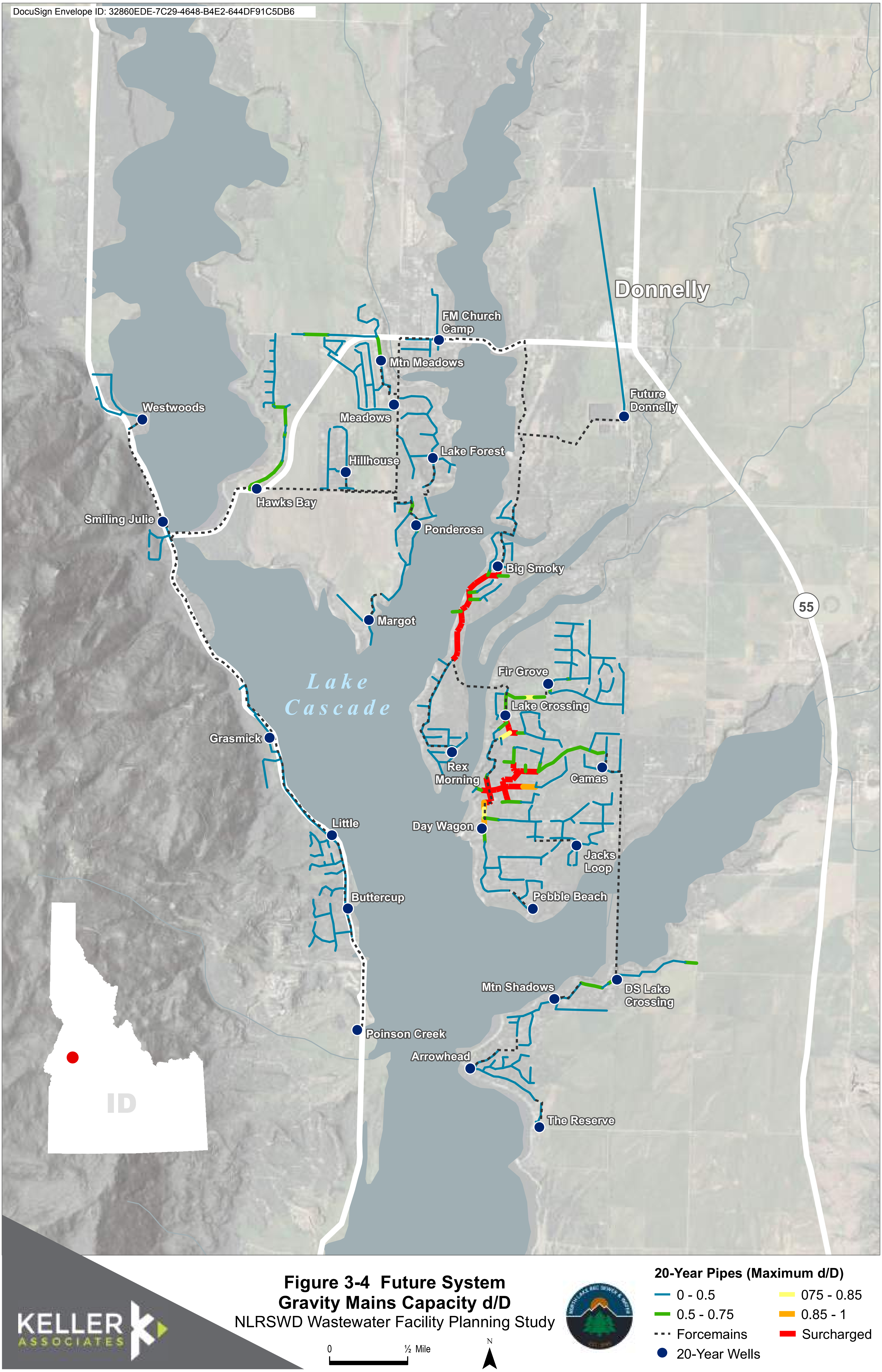


Figure 3-4 Future System
Gravity Mains Capacity d/D
NLRSWD Wastewater Facility Planning Study

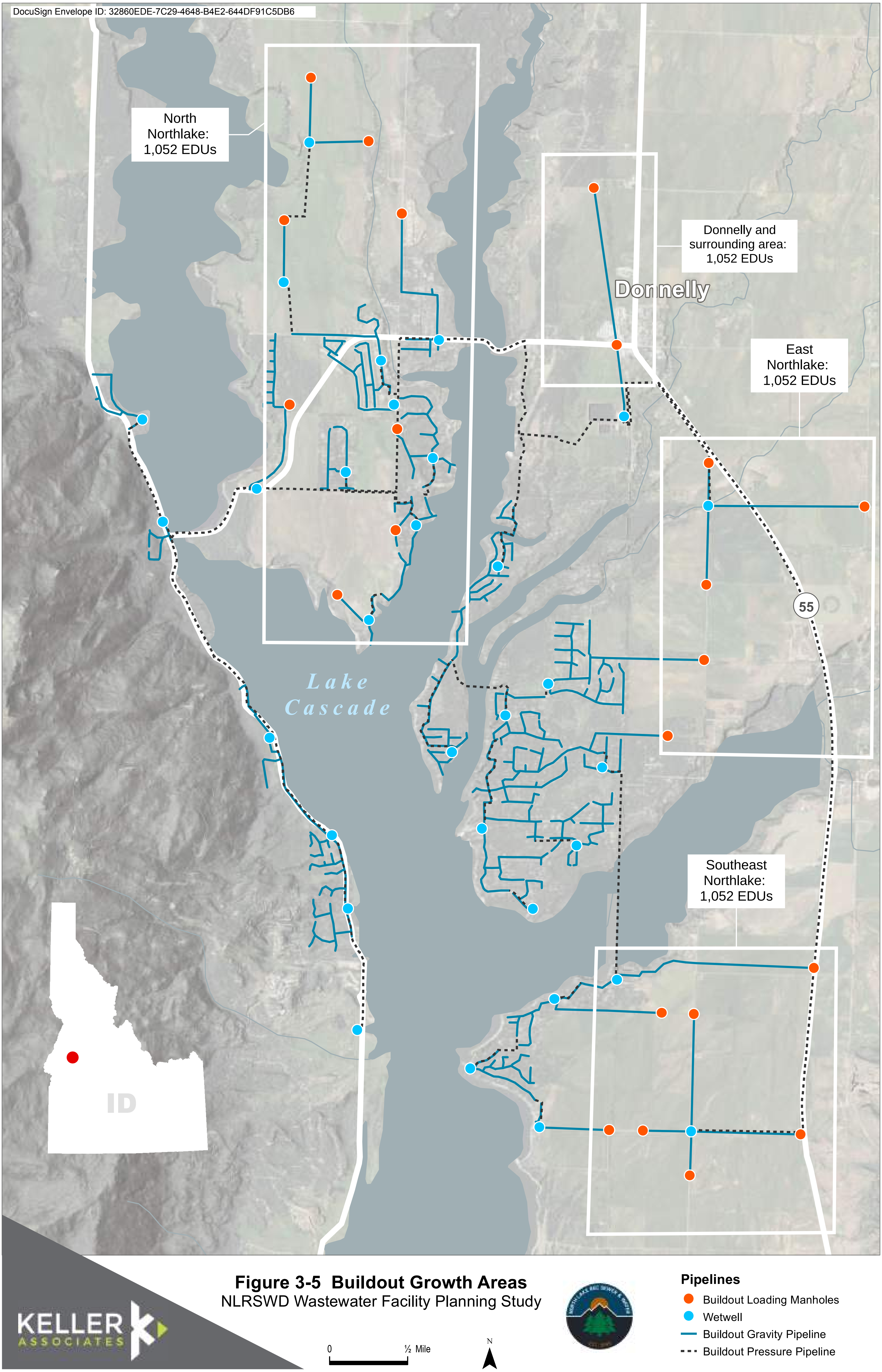


Figure 3-5 Buildout Growth Areas

NLRSWD Wastewater Facility Planning Study

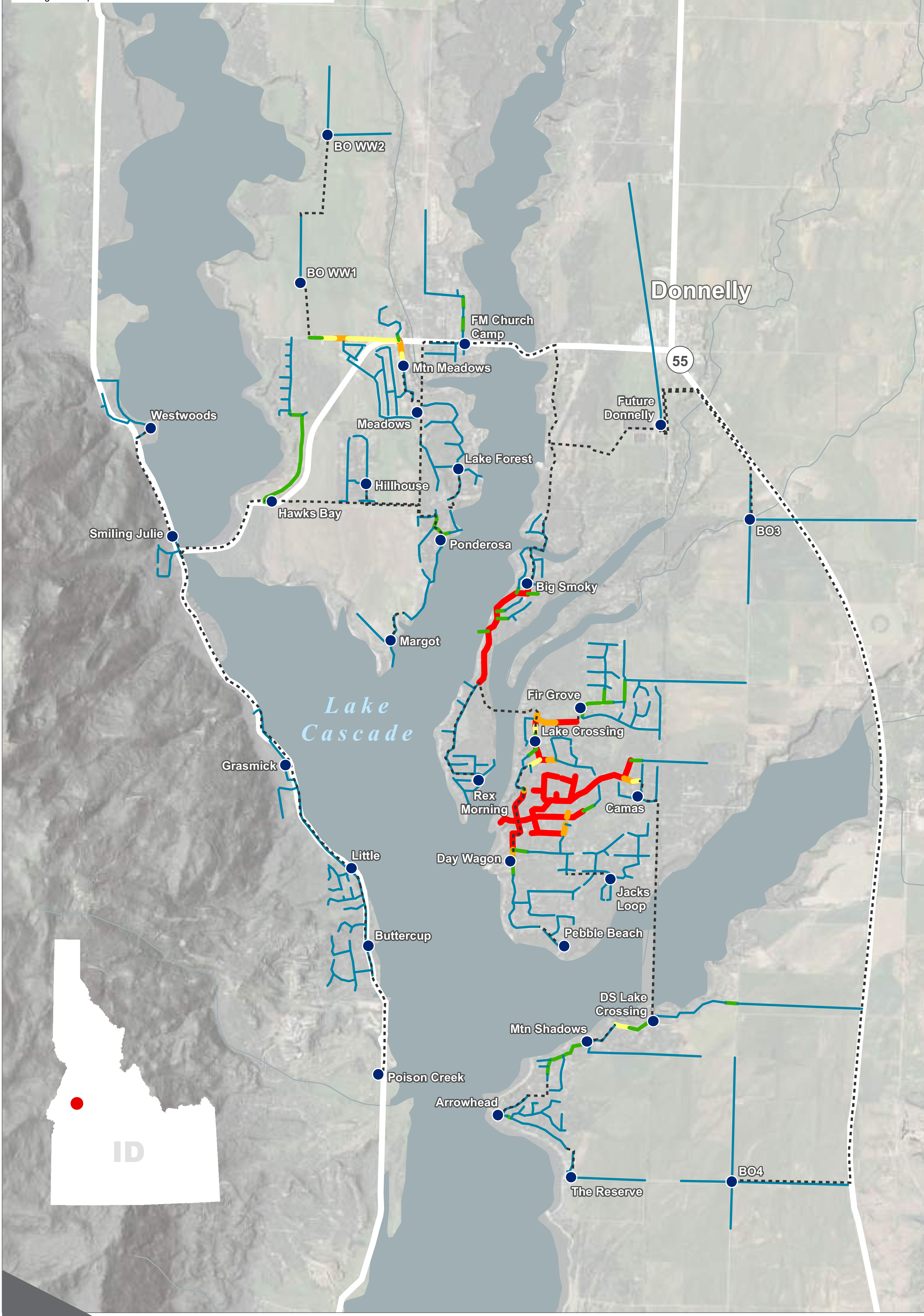


Figure 3-6 Buildout Gravity Mains Capacity
NLRSWD Wastewater Facility Planning Study

KELLER ASSOCIATES

0 ½ Mile

N

Buildout Pipes (Maximum d/D)
- 0 - 0.5
- 0.5 - 0.75
- 0.75 - 0.85
- 0.85 - 1
- Forcemains
- Surcharged
- Buildout Wells

APPENDIX C

Financial Status of Existing Facilities

1 GENERAL FUND

Account Object	Description	Current Month	Current YTD	Budget	Variance	%
		------------------- Current Year			---------------------------	
Revenue						
30500	TAX	230,996.96	230,996.96	222,035.00	8,961.96	104
30600	WATER	82,536.00	82,536.00	86,400.00	-3,864.00	96
30700	TAMARACK WATER	194,826.00	194,826.00	181,440.00	13,386.00	107
31000	SEWER	636,120.00	636,120.00	633,600.00	2,520.00	100
31100	CITY OF DONNELLY SEWER	57,600.00	57,600.00	57,600.00		100
31500	INTEREST INCOME	18,984.91	18,984.91	27,600.00	-8,615.09	69
31510	OLD LCF INT INCOME-DIST.	262.62	262.62		262.62	
31520	OLD NL INT INCOME - DIST.	3,341.01	3,341.01		3,341.01	
32000	PENALTY	8,257.80	8,257.80		8,257.80	
32100	BILLING FEES	40,818.68	40,818.68	12,565.00	28,253.68	325
32200	TAMAR.II LID BILLING FEES	3,440.84	3,440.84	18,612.00	-15,171.16	18
32201	TAMAR.III LID BILLING FEES	19,255.25	19,255.25	39,218.00	-19,962.75	49
32202	TAMAR.III LID 2% PENALTY	11,422.90	11,422.90	3,098.00	8,324.90	369
32300	TAMAR. I LID BILLING FEES	6,018.41	6,018.41		6,018.41	
32400	WAGON WHEEL LID BILL. FEES	1,113.28	1,113.28	5,854.00	-4,740.72	19
32700	MM/WM LID BILLING FEES	490.68	490.68	1,125.00	-634.32	44
32800	DAYSTAR WATER LID BILLING FEE	906.20	906.20	525.00	381.20	173
32900	LCR LID BILLING FEES	299.52	299.52	952.00	-652.48	31
32910	W.SIDE LID BILLING FEES	12,253.39	12,253.39	369.00	11,884.39	3321
33000	INSPECTION FEES SEWER	5,490.00	5,490.00	3,150.00	2,340.00	174
33100	INSPECTION FEES WATER	1,710.00	1,710.00	1,125.00	585.00	152
33200	WATER TURN ON/OFF FEE	200.00	200.00	200.00		100
34000	ANNEX/PLAN REVIEW	5,760.15	5,760.15	2,400.00	3,360.15	240
35100	J&R/HONEY D/ASAP SEPTAGE	89,282.30	89,282.30	50,000.00	39,282.30	179
35200	G&S PROP.-L.S. OPER. FEE	1,500.00	1,500.00	1,500.00		100
						106
	Total Revenue	**1,432,886.90**	**1,432,886.90**	**1,349,368.00**	**83,518.90**	**106**
Expenses						
50100	AERATION/IRRIGATION PLANT					
430	REPAIR & MAINT	306.91	306.91	4,500.00	4,193.09	7
680	MISC. EQUIPMENT	123.19	123.19	825.00	701.81	15
	Total Account	**430.10**	**430.10**	**5,325.00**	**4,894.90**	**8**
51100	LAND APPLICATION					
425	SPRINKLER REP/PART	48.02	48.02	1,030.00	981.98	5
613	CHEMICALS	8,669.46	8,669.46	3,090.00	-5,579.46	281
664	MISC. EXPENSE	87.36	87.36	1,600.00	1,512.64	5
	Total Account	**8,804.84**	**8,804.84**	**5,720.00**	**-3,084.84**	**154**
51200	MBR Headworks					
431	PARTS	5,792.02	5,792.02	10,000.00	4,207.98	58
432	BUILDING REPAIR/MAINT.	147.37	147.37	206.00	58.63	72

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			Current Year				
		Total Account	**5,939.39**	**5,939.39**	**10,206.00**	**4,266.61**	**58**
51300		MBR PLANT					
	410	POWER	67,304.25	67,304.25	77,250.00	9,945.75	87
	424	DUMPSTER DISPOSAL	1,465.90	1,465.90	824.00	-641.90	178
	431	PARTS	9,599.07	9,599.07	10,300.00	700.93	93
	432	BUILDING REPAIR/MAINT.	2,668.07	2,668.07	5,150.00	2,481.93	52
	451	CONTRACT OPER. EXP	44,130.00	44,130.00	43,800.00	-330.00	101
	530	TELEPHONE	1,827.35	1,827.35	1,854.00	26.65	99
	611	WATER	418.78	418.78	515.00	96.22	81
	613	CHEMICALS	9,582.84	9,582.84	11,640.00	2,057.16	82
	614	TESTING	2,879.39	2,879.39	7,110.00	4,230.61	40
	615	POND TEST/MISC EXP	325.00	325.00		-325.00	
	652	CERTIF/PERMIT/LICENSES	585.00	585.00	1,030.00	445.00	57
	660	OFFICE EXPENSE	269.28	269.28	1,030.00	760.72	26
	680	MISC. EQUIPMENT	3.50	3.50	20,500.00	20,496.50	
		Total Account	**141,058.43**	**141,058.43**	**181,003.00**	**39,944.57**	**78**
52000		LIFT STATION					
	410	POWER	21,657.54	21,657.54	21,630.00	-27.54	100
	411	PROPANE	1,270.08	1,270.08	2,000.00	729.92	64
	422	SNOW REMOVAL	6,193.00	6,193.00	4,635.00	-1,558.00	134
	430	REPAIR & MAINT	348.08	348.08	2,060.00	1,711.92	17
	431	PARTS	12,647.24	12,647.24	30,600.00	17,952.76	41
	464	CLEAN LINES	27,856.24	27,856.24	20,900.00	-6,956.24	133
	530	TELEPHONE	9,997.32	9,997.32	9,888.00	-109.32	101
		Total Account	**79,969.50**	**79,969.50**	**91,713.00**	**11,743.50**	**87**
52100		CITY OF DONNELLY					
	410	POWER	957.53	957.53	1,442.00	484.47	66
	462	MANHOLE REPAIR & PARTS	775.00	775.00	1,030.00	255.00	75
	464	CLEAN LINES	307.44	307.44	4,120.00	3,812.56	7
		Total Account	**2,039.97**	**2,039.97**	**6,592.00**	**4,552.03**	**31**
53000		SEWER					
	441	STORAGE BUILDING	660.00	660.00	679.00	19.00	97
	452	DIGLINE LOCATE EXPENSE	636.40	636.40	310.00	-326.40	205
	461	SEWER SERV. LINE REPAIR/MAINT.	2,418.79	2,418.79	6,180.00	3,761.21	39
	462	MANHOLE REPAIR & PARTS	2,427.53	2,427.53	21,121.00	18,693.47	11
		Total Account	**6,142.72**	**6,142.72**	**28,290.00**	**22,147.28**	**22**
57000		WATER					
	422	SNOW REMOVAL	1,444.00	1,444.00	1,545.00	101.00	93
	430	REPAIR & MAINT	268.89	268.89	1,545.00	1,276.11	17
	431	PARTS	896.33	896.33	2,060.00	1,163.67	44
	432	BUILDING REPAIR/MAINT.	30.92	30.92	1,030.00	999.08	3
	530	TELEPHONE	300.00	300.00	309.00	9.00	97
	613	CHEMICALS	5,800.25	5,800.25	7,210.00	1,409.75	80
	614	TESTING	2,437.00	2,437.00	4,500.00	2,063.00	54
	616	METERS & PARTS	61.59	61.59	1,030.00	968.41	6

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
	652	CERTIF/PERMIT/LICENSES	1,160.00	1,160.00	772.50	-387.50	150
		Total Account	**12,398.98**	**12,398.98**	**20,001.50**	**7,602.52**	**62**
57100		TAMARACK					
	332	NEW DEVELOPEMENT ENGINEERING EXP.	580.00	580.00		-580.00	
	333	ATTORNEY FEES	2,965.00	2,965.00	10,000.00	7,035.00	30
	430	REPAIR & MAINT	97.10	97.10	1,442.00	1,344.90	7
	431	PARTS	2,883.24	2,883.24	4,120.00	1,236.76	70
	613	CHEMICALS	4,659.43	4,659.43	4,532.00	-127.43	103
	614	TESTING	513.00	513.00	3,090.00	2,577.00	17
	652	CERTIF/PERMIT/LICENSES	1,427.00	1,427.00	772.50	-654.50	185
		Total Account	**13,124.77**	**13,124.77**	**23,956.50**	**10,831.73**	**55**
57200		DAY STAR WELL					
	410	POWER	3,493.39	3,493.39	3,888.00	394.61	90
		Total Account	**3,493.39**	**3,493.39**	**3,888.00**	**394.61**	**90**
57300		FIR GROVE WELL					
	410	POWER	3,831.35	3,831.35	2,800.00	-1,031.35	137
		Total Account	**3,831.35**	**3,831.35**	**2,800.00**	**-1,031.35**	**137**
57400		HAWKS BAY WELL					
	410	POWER	3,439.79	3,439.79	3,200.00	-239.79	107
		Total Account	**3,439.79**	**3,439.79**	**3,200.00**	**-239.79**	**107**
61000		OFFICE					
	260	WORKMAN'S COMP			6,000.00	6,000.00	
	334	COMP. SUPPORT & ESET VIRUS	1,929.82	1,929.82	2,060.00	130.18	94
	410	POWER	1,027.71	1,027.71		-1,027.71	
	411	PROPANE	3,206.13	3,206.13		-3,206.13	
	420	CLEANING EXP.	430.00	430.00		-430.00	
	423	TRASH EXP.	490.38	490.38		-490.38	
	520	I.C.R.M.P.-LIAB. & OTHER INS	20,551.00	20,551.00	18,930.00	-1,621.00	109
	531	CELL TELEPHONE/INTERNET	4,368.66	4,368.66	9,373.00	5,004.34	47
	540	PUBLISHING	369.60	369.60	206.00	-163.60	179
	541	PRINTING/COPYING EXP.	1,150.00	1,150.00	206.00	-944.00	558
	542	DUES & SUBSCRIPTIONS	50.00	50.00	206.00	156.00	24
	580	TRAVEL	64.38	64.38	103.00	38.62	63
	581	MILEAGE EXPENSE	655.81	655.81		-655.81	
	590	TRAINING	33.62	33.62	206.00	172.38	16
	610	SUPPLIES	3,687.14	3,687.14	6,180.00	2,492.86	60
	650	BANK FEES	1,025.58	1,025.58	103.00	-922.58	996
	651	BONDING EXPENSE	175.00	175.00	180.00	5.00	97
	653	ANNEXATION EXPENSE	6,898.14	6,898.14	2,472.00	-4,426.14	279
	661	FORMS/BILLING CARDS/CKS	367.51	367.51	2,575.00	2,207.49	14
	662	MAILINGS & POSTAGE	7,354.90	7,354.90	9,476.00	2,121.10	78
	663	MISC. OFFICE EXPENSE	2,228.73	2,228.73	9,644.00	7,415.27	23
		Total Account	**56,064.11**	**56,064.11**	**67,920.00**	**11,855.89**	**83**
61100		ADMIN					

1 GENERAL FUND

Account	Object	Description	Current Year: Current Month	Current YTD	Budget	Variance	%
	110	SALARY- ADMINISTRATIVE	202,537.69	202,537.69	184,600.00	-17,937.69	110
	111	SALARY- MAINTENANCE	189,767.03	189,767.03	200,700.00	10,932.97	95
	220	EMPLR FICA & MEDICARE EXP	30,604.18	30,604.18	37,476.00	6,871.82	82
	260	WORKMAN'S COMP	4,775.00	4,775.00		-4,775.00	
	290	HEALTH INSURANCE	76,672.02	76,672.02	77,425.00	752.98	99
	291	RETIREMENT EXPENSE	36,499.13	36,499.13		-36,499.13	
	292	MAINT CLOTHING ALLOWANCE	1,538.89	1,538.89		-1,538.89	
	311	BOARD EXPENSE	5,800.00	5,800.00	7,500.00	1,700.00	77
	450	CONTRACT LABOR	11,272.50	11,272.50	47,460.00	36,187.50	24
		Total Account	**559,466.44**	**559,466.44**	**555,161.00**	**-4,305.44**	**101**
62000		GENERAL					
	330	PROF.AUDIT/ACCT.SERV/PREP.W-2	7,225.00	7,225.00	7,500.00	275.00	96
	331	PROF. ENGINEERING SERVICES	3,201.25	3,201.25	1,000.00	-2,201.25	320
	333	ATTORNEY FEES	15,020.93	15,020.93	6,500.00	-8,520.93	231
	335	FACILITIES PLANNING STUDIES	25,059.15	25,059.15	22,000.00	-3,059.15	114
	654	ANNEXATION FEE - REFUND	675.00	675.00		-675.00	
	690	MISC. OVERPAYMENT - REFUNDS	3,460.00	3,460.00		-3,460.00	
		Total Account	**54,641.33**	**54,641.33**	**37,000.00**	**-17,641.33**	**148**
63000		SHOP					
	410	POWER	1,418.89	1,418.89	1,442.00	23.11	98
	612	SHOP SUPPLIES	292.17	292.17		-292.17	
		Total Account	**1,711.06**	**1,711.06**	**1,442.00**	**-269.06**	**119**
65000		EQUIPTMENT EXPENSE					
	626	VEHICLE GAS EXPENSE	9,756.19	9,756.19	12,875.00	3,118.81	76
	627	VEHICLE MISC. PARTS/REPAIRS	5,348.12	5,348.12	3,090.00	-2,258.12	173
	628	DIESEL EXPENSE	776.01	776.01	1,236.00	459.99	63
	629	BOBCAT MISC. EXPENSE	2.54	2.54	515.00	512.46	
	670	MISC. TOOLS	1,022.44	1,022.44	1,030.00	7.56	99
	680	MISC. EQUIPMENT	86.91	86.91	6,000.00	5,913.09	1
	681	MISC. EQUIPMENT EXP	594.16	594.16	38,745.00	38,150.84	2
		Total Account	**17,586.37**	**17,586.37**	**63,491.00**	**45,904.63**	**28**
68000		OFFICE BUILDING EXPENSE					
	410	POWER			1,854.00	1,854.00	
	411	PROPANE			4,944.00	4,944.00	
	420	CLEANING EXP.			700.00	700.00	
	423	TRASH EXP.			278.00	278.00	
	430	REPAIR & MAINT	668.09	668.09	930.00	261.91	72
	460	SEWER & WATER EXP.	906.63	906.63	927.00	20.37	98
		Total Account	**1,574.72**	**1,574.72**	**9,633.00**	**8,058.28**	**16**
		Total Expenses	**971,717.26**	**971,717.26**	**1,117,342.00**	**145,624.74**	**87**
		Net Income from Operations	461,169.64	461,169.64			

1 GENERAL FUND

		Current Year				
Account Object	Description	Current Month	Current YTD	Budget	Variance	%
Other Revenue						
36000	MISC. INCOME	51,432.18	51,432.18		51,432.18	
	Total Other Revenue	**51,432.18**	**51,432.18**	**0.00**	**51,432.18**	
	Net Income	512,601.82	512,601.82			

2 CAPITAL IMPROVEMENT

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			Current Year				
Revenue							
35500		C.OF DONN. INTERC/S.L.CAP.	1,500.00	1,500.00	1,500.00		100
35510		SEWER INTERC/LINE CAP.FEES	42,000.00	42,000.00	18,000.00	24,000.00	233
35511		C. OF DONNELLY S.A.F. SWR	6,000.00	6,000.00	6,000.00		100
35520		SEWER S.A.F. GENERAL FEES	192,000.00	192,000.00	72,000.00	120,000.00	267
35530		WATER INTERC/LINE CAP FEES	4,500.00	4,500.00	7,500.00	-3,000.00	60
35540		WATER SERVICE AVAIL. FEE	78,000.00	78,000.00	30,000.00	48,000.00	260
							240
		Total Revenue	**324,000.00**	**324,000.00**	**135,000.00**	**189,000.00**	**240**
Expenses							
51100		LAND APPLICATION					
	730	CAPITAL IMPROVEMENT	14,358.00	14,358.00	11,030.00	-3,328.00	130
	732	CAP.IMP. AREAT/IRRIG.PLANT-EXP	2,800.00	2,800.00	1,030.00	-1,770.00	272
		Total Account	**17,158.00**	**17,158.00**	**12,060.00**	**-5,098.00**	**142**
51200		MBR Headworks					
	730	CAPITAL IMPROVEMENT	3,002.61	3,002.61	6,490.00	3,487.39	46
		Total Account	**3,002.61**	**3,002.61**	**6,490.00**	**3,487.39**	**46**
51300		MBR PLANT					
	730	CAPITAL IMPROVEMENT	102,772.71	102,772.71	117,640.00	14,867.29	87
		Total Account	**102,772.71**	**102,772.71**	**117,640.00**	**14,867.29**	**87**
52000		LIFT STATION					
	730	CAPITAL IMPROVEMENT	33,105.23	33,105.23	10,300.00	-22,805.23	321
		Total Account	**33,105.23**	**33,105.23**	**10,300.00**	**-22,805.23**	**321**
52100		CITY OF DONNELLY					
	730	CAPITAL IMPROVEMENT	800.00	800.00	8,240.00	7,440.00	10
		Total Account	**800.00**	**800.00**	**8,240.00**	**7,440.00**	**10**
53000		SEWER					
	730	CAPITAL IMPROVEMENT	22,118.16	22,118.16	10,300.00	-11,818.16	215
	731	CAP.IMP SEPTAGE REC FACILITY	1,048.00	1,048.00	175,000.00	173,952.00	1
	733	CAP.IMP. STEP TANK PARTS	3,140.50	3,140.50	1,545.00	-1,595.50	203
	734	CAP.IMP. STEP TANKS/LIDS/RISER	1,846.85	1,846.85		-1,846.85	
		Total Account	**28,153.51**	**28,153.51**	**186,845.00**	**158,691.49**	**15**
57000		WATER					
	730	CAPITAL IMPROVEMENT	9,164.37	9,164.37	7,210.00	-1,954.37	127
		Total Account	**9,164.37**	**9,164.37**	**7,210.00**	**-1,954.37**	**127**
61000		OFFICE					
	730	CAPITAL IMPROVEMENT	22,755.92	22,755.92	8,960.00	-13,795.92	254

2 CAPITAL IMPROVEMENT

Account Object	Description	Current Year: Current Month	Current YTD	Budget	Variance	%
	Total Account	**22,755.92**	**22,755.92**	**8,960.00**	**-13,795.92**	**254**
	Total Expenses	**216,912.35**	**216,912.35**	**357,745.00**	**140,832.65**	**61**
	Net Income from Operations	107,087.65	107,087.65			
	Net Income	107,087.65	107,087.65			

NORTH LAKE SEWER AND WATER
Income Statement
For the Accounting Period: 11 / 21

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			Current Year				
Revenue							
30500		TAX	936.50	255,681.42	231,075.00	24,606.42	111
30600		WATER	11,220.00	116,058.58	99,120.00	16,938.58	117
30700		TAMARACK WATER	22,872.00	257,794.81	229,680.00	28,114.81	112
31000		SEWER	98,602.00	1,007,390.85	818,160.00	189,230.85	123
31100		CITY OF DONNELLY SEWER	8,400.00	86,400.00	72,240.00	14,160.00	120
31500		INTEREST INCOME	157.57	5,031.34	28,500.00	-23,468.66	18
31510		OLD LCF INT INCOME-DIST.	2.10	184.02		184.02	
31520		OLD NL INT INCOME - DIST.	20.20	262.35		262.35	
32000		PENALTY	-90.00	5,615.09		5,615.09	
32100		BILLING FEES	2,863.83	247,133.15	12,565.00	234,568.15	1967
32200		TAMAR.II LID BILLING FEES			18,612.00	-18,612.00	
32201		TAMAR.III LID BILLING FEES	19,028.33	153,429.77	38,675.00	114,754.77	397
32202		TAMAR.III LID 2% PENALTY	11,229.95	11,229.95	3,098.00	8,131.95	362
32300		TAMAR. I LID BILLING FEES	6,092.18	27,887.02		27,887.02	
32400		WAGON WHEEL LID BILL. FEES	1,062.16	1,062.16	5,854.00	-4,791.84	18
32700		MM/WM LID BILLING FEES	459.66	459.66	1,125.00	-665.34	41
32800		DAYSTAR WATER LID BILLING FEE	836.05	836.05	525.00	311.05	159
32900		LCR LID BILLING FEES	227.84	227.84	952.00	-724.16	24
32910		W.SIDE LID BILLING FEES	11,503.04	11,503.04	369.00	11,134.04	3117
33000		INSPECTION FEES SEWER	50.00	8,395.00	3,500.00	4,895.00	240
33100		INSPECTION FEES WATER	50.00	2,550.00	1,250.00	1,300.00	204
33200		WATER TURN ON/OFF FEE			200.00	-200.00	
34000		ANNEX/PLAN REVIEW		13,946.83	2,400.00	11,546.83	581
35100		J&R/HONEY D/ASAP SEPTAGE	9,577.97	87,760.72	70,000.00	17,760.72	125
35200		G&S PROP.-L.S. OPER. FEE		625.00	1,800.00	-1,175.00	35
35600		NEW DEVELOPMENT FEES		2,425.08	20,000.00	-17,574.92	12
35601		FACILITES PLANNING STUDIES			2,000.00	-2,000.00	
							139
		Total Revenue	**205,101.38**	**2,303,889.73**	**1,661,700.00**	**642,189.73**	**139**
Expenses							
50100		AERATION/IRRIGATION PLANT					
	426	WEED CONTROL			2,445.00	2,445.00	
	430	REPAIR & MAINT		1,500.00	4,635.00	3,135.00	32
	432	BUILDING REPAIR/MAINT.		458.42	1,060.00	601.58	43
	680	MISC. EQUIPMENT			850.00	850.00	
		Total Account		**1,958.42**	**8,990.00**	**7,031.58**	**22**
51100		LAND APPLICATION					
	425	SPRINKLER REP/PART		1,371.69	1,100.00	-271.69	125
	613	CHEMICALS		10,096.75	3,185.00	-6,911.75	317
	617	PUMP/ FLOWMETER EXPENSE	3,851.19	3,886.18	20,000.00	16,113.82	19
	618	CLOR. SYS REPAIR/PARTS		141.34	1,100.00	958.66	13
	664	MISC. EXPENSE			1,650.00	1,650.00	

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
				Current Year			
		Total Account	**3,851.19**	**15,495.96**	**27,035.00**	**11,539.04**	**57**
51200		MBR Headworks					
	412	HEATER FUEL		182.00	1,100.00	918.00	17
	431	PARTS	571.82	8,970.61	10,300.00	1,329.39	87
	432	BUILDING REPAIR/MAINT.	929.81	1,216.46	215.00	-1,001.46	566
	433	TRANSFER BUILDING PARTS			550.00	550.00	
		Total Account	**1,501.63**	**10,369.07**	**12,165.00**	**1,795.93**	**85**
51220		STEP TANKS					
	465	STEP TANK REPAIR & PARTS			2,125.00	2,125.00	
	466	STEP TANK / LIDS/ RISERS EXP			18,600.00	18,600.00	
		Total Account			**20,725.00**	**20,725.00**	
51230		SCADA SYSTEM					
	467	SCADA SYSTEM REPAIR		483.50	550.00	66.50	88
		Total Account		**483.50**	**550.00**	**66.50**	**88**
51300		MBR PLANT					
	334	COMP. SUPPORT & ESET VIRUS		419.25	1,445.00	1,025.75	29
	410	POWER	5,424.46	75,394.76	80,000.00	4,605.24	94
	420	CLEANING EXP.	21.97	56.33		-56.33	
	424	DUMPSTER DISPOSAL	224.64	1,493.20	900.00	-593.20	166
	431	PARTS		13,595.27	10,610.00	-2,985.27	128
	432	BUILDING REPAIR/MAINT.		1,766.45	10,000.00	8,233.55	18
	451	CONTRACT OPER. EXP	2,000.00	25,980.00	32,250.00	6,270.00	81
	530	TELEPHONE	152.13	1,853.24	1,900.00	46.76	98
	611	WATER	32.98	438.23	530.00	91.77	83
	613	CHEMICALS		3,473.96	12,000.00	8,526.04	29
	614	TESTING	120.00	2,016.74	12,325.00	10,308.26	16
	615	POND TEST/MISC EXP		13,010.00	1,060.00	-11,950.00	1227
	628	DIESEL EXPENSE			1,880.00	1,880.00	
	652	CERTIF/PERMIT/LICENSES		60.00	1,060.00	1,000.00	6
	655	ZENON (SUEZ) SUPPORT			2,550.00	2,550.00	
	660	OFFICE EXPENSE		491.76	1,060.00	568.24	46
	664	MISC. EXPENSE		253.97	1,060.00	806.03	24
	670	MISC. TOOLS		120.06	530.00	409.94	23
	680	MISC. EQUIPMENT		32.19	21,115.00	21,082.81	
		Total Account	**7,976.18**	**140,455.41**	**192,275.00**	**51,819.59**	**73**
51400		RI BASIN					
	422	SNOW REMOVAL			100.00	100.00	
	664	MISC. EXPENSE			4,120.00	4,120.00	
		Total Account			**4,220.00**	**4,220.00**	
52000		LIFT STATION					
	410	POWER	1,421.47	22,096.19	22,280.00	183.81	99
	411	PROPANE		1,662.76	2,060.00	397.24	81
	422	SNOW REMOVAL		9,153.00	4,775.00	-4,378.00	192
	430	REPAIR & MAINT	758.10	14,419.79	2,125.00	-12,294.79	679

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			------------------- Current Year			--------------------------	
	431	PARTS		9,725.97	31,520.00	21,794.03	31
	434	BUILDINGS MISC. EXP		53.74	2,060.00	2,006.26	3
	464	CLEAN LINES		5,350.00	21,550.00	16,200.00	25
	530	TELEPHONE	816.40	10,125.06	10,185.00	59.94	99
	628	DIESEL EXPENSE			530.00	530.00	
		Total Account	**2,995.97**	**72,586.51**	**97,085.00**	**24,498.49**	**75**
52100		CITY OF DONNELLY					
	410	POWER	62.18	902.16	1,500.00	597.84	60
	422	SNOW REMOVAL			210.00	210.00	
	430	REPAIR & MAINT		1,547.72	2,200.00	652.28	70
	431	PARTS			2,500.00	2,500.00	
	461	SEWER SERV. LINE REPAIR/MAINT.		3,937.50	2,200.00	-1,737.50	179
	462	MANHOLE REPAIR & PARTS		3,925.00	1,060.00	-2,865.00	370
	464	CLEAN LINES			4,250.00	4,250.00	
	656	LAND LEASE AGREEMENT		1,500.00	775.00	-725.00	194
		Total Account	**62.18**	**11,812.38**	**14,695.00**	**2,882.62**	**80**
53000		SEWER					
	441	STORAGE BUILDING		940.00	700.00	-240.00	134
	452	DIGLINE LOCATE EXPENSE	80.08	718.90	320.00	-398.90	225
	461	SEWER SERV. LINE REPAIR/MAINT.		665.70	6,375.00	5,709.30	10
	462	MANHOLE REPAIR & PARTS			21,750.00	21,750.00	
	463	SEWER REPAIRS - SPRING RUN OFF			1,060.00	1,060.00	
	464	CLEAN LINES		998.84		-998.84	
	468	DISTRICT EXP. - RAISE MANHOLES			1,060.00	1,060.00	
	469	COLLECTION SYSTEM REPAIR & PARTS	1,294.96	1,689.96	2,125.00	435.04	80
	652	CERTIF/PERMIT/LICENSES		195.00		-195.00	
		Total Account	**1,375.04**	**5,208.40**	**33,390.00**	**28,181.60**	**16**
57000		WATER					
	422	SNOW REMOVAL		225.00	1,600.00	1,375.00	14
	430	REPAIR & MAINT		2,963.22	1,590.00	-1,373.22	186
	431	PARTS	1.49	1.49	2,125.00	2,123.51	
	432	BUILDING REPAIR/MAINT.	855.00	855.00	1,060.00	205.00	81
	470	SERVICE LINE REPAIR/PARTS		1,901.00	1,600.00	-301.00	119
	471	HYDRANT REPAIR/PARTS			1,060.00	1,060.00	
	472	HYDRANT SERVICE MARKERS			2,125.00	2,125.00	
	530	TELEPHONE	25.00	275.00	320.00	45.00	86
	613	CHEMICALS		5,744.60	7,500.00	1,755.40	77
	614	TESTING	104.00	3,285.50	4,700.00	1,414.50	70
	616	METERS & PARTS	3,450.00	3,457.28	1,060.00	-2,397.28	326
	652	CERTIF/PERMIT/LICENSES		2,385.00	800.00	-1,585.00	298
		Total Account	**4,435.49**	**21,093.09**	**25,540.00**	**4,446.91**	**83**
57100		TAMARACK					
	332	NEW DEVELOPEMENT ENGINEERING EXP.		1,697.50		-1,697.50	
	333	ATTORNEY FEES	4,217.00	4,217.00	10,000.00	5,783.00	42
	430	REPAIR & MAINT	4,390.59	129,390.59	1,500.00	-127,890.59	8626
	431	PARTS		14,269.47	4,250.00	-10,019.47	336

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			---- Current Year ----				
	432	BUILDING REPAIR/MAINT.		180.00	1,060.00	880.00	17
	464	CLEAN LINES		1,900.00		-1,900.00	
	470	SERVICE LINE REPAIR/PARTS			2,200.00	2,200.00	
	471	HYDRANT REPAIR/PARTS			1,060.00	1,060.00	
	613	CHEMICALS		4,434.85	4,675.00	240.15	95
	614	TESTING		204.00	3,200.00	2,996.00	6
	616	METERS & PARTS			1,060.00	1,060.00	
	652	CERTIF/PERMIT/LICENSES		1,427.00	2,000.00	573.00	71
		Total Account	**8,607.59**	**157,720.41**	**31,005.00**	**-126,715.41**	**509**
57200		DAY STAR WELL					
	410	POWER	622.99	4,867.53	3,400.00	-1,467.53	143
		Total Account	**622.99**	**4,867.53**	**3,400.00**	**-1,467.53**	**143**
57300		FIR GROVE WELL					
	410	POWER	209.14	3,929.25	3,400.00	-529.25	116
		Total Account	**209.14**	**3,929.25**	**3,400.00**	**-529.25**	**116**
57400		HAWKS BAY WELL					
	410	POWER	305.89	3,574.47	3,400.00	-174.47	105
		Total Account	**305.89**	**3,574.47**	**3,400.00**	**-174.47**	**105**
61000		OFFICE					
	260	WORKMAN'S COMP	1,214.00	1,214.00	6,180.00	4,966.00	20
	334	COMP. SUPPORT & ESET VIRUS		3,022.50	2,500.00	-522.50	121
	410	POWER		309.72		-309.72	
	411	PROPANE		1,670.08		-1,670.08	
	420	CLEANING EXP.		160.00		-160.00	
	423	TRASH EXP.		67.47		-67.47	
	520	I.C.R.M.P.-LIAB. & OTHER INS		22,400.50	21,450.00	-950.50	104
	531	CELL TELEPHONE/INTERNET	411.88	4,997.48	9,700.00	4,702.52	52
	540	PUBLISHING		742.72	250.00	-492.72	297
	541	PRINTING/COPYING EXP.			225.00	225.00	
	542	DUES & SUBSCRIPTIONS	100.00	618.85	250.00	-368.85	248
	543	LEGAL RECORDINGS			220.00	220.00	
	580	TRAVEL	132.82	578.99	110.00	-468.99	526
	581	MILEAGE EXPENSE		181.11		-181.11	
	590	TRAINING			225.00	225.00	
	610	SUPPLIES	167.62	3,505.97	6,500.00	2,994.03	54
	650	BANK FEES	46.46	1,466.88	600.00	-866.88	244
	651	BONDING EXPENSE			185.00	185.00	
	653	ANNEXATION EXPENSE	85.80	13,315.33	2,500.00	-10,815.33	533
	657	MONTHLY BILLING EXPENSE		79.79		-79.79	
	661	FORMS/BILLING CARDS/CKS	1,010.74	2,970.28	2,700.00	-270.28	110
	662	MAILINGS & POSTAGE	714.65	7,487.51	9,760.00	2,272.49	77
	663	MISC. OFFICE EXPENSE	87.15	7,051.30	10,000.00	2,948.70	71
	665	OFFICE EQUIPMENT REPAIR			725.00	725.00	
	680	MISC. EQUIPMENT	745.00	1,623.73		-1,623.73	
		Total Account	**4,716.12**	**73,464.21**	**74,080.00**	**615.79**	**99**

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			---------- Current Year ----------				
61100		ADMIN					
	110	SALARY- ADMINISTRATIVE	18,199.24	219,584.57	224,000.00	4,415.43	98
	111	SALARY- MAINTENANCE	12,088.82	175,704.98	273,000.00	97,295.02	64
	220	EMPLR FICA & MEDICARE EXP	2,347.64	30,677.59	38,500.00	7,822.41	80
	260	WORKMAN'S COMP	338.70	4,227.57		-4,227.57	
	290	HEALTH INSURANCE	5,661.40	72,467.18	98,000.00	25,532.82	74
	291	RETIREMENT EXPENSE	3,652.22	47,998.49	60,500.00	12,501.51	79
	292	MAINT CLOTHING ALLOWANCE		276.40		-276.40	
	311	BOARD EXPENSE	400.00	5,200.00	7,500.00	2,300.00	69
	450	CONTRACT LABOR		122.50		-122.50	
		Total Account	**42,688.02**	**556,259.28**	**701,500.00**	**145,240.72**	**79**
62000		GENERAL					
	330	PROF.AUDIT/ACCT.SERV/PREP.W-2		7,435.00	7,500.00	65.00	99
	331	PROF. ENGINEERING SERVICES		43,991.15	15,000.00	-28,991.15	293
	333	ATTORNEY FEES	-4,217.00	2,400.00	7,000.00	4,600.00	34
	335	FACILITIES PLANNING STUDIES		2,372.70	22,000.00	19,627.30	11
	664	MISC. EXPENSE		973.80		-973.80	
	690	MISC. OVERPAYMENT - REFUNDS	766.00	2,208.59		-2,208.59	
		Total Account	**-3,451.00**	**59,381.24**	**51,500.00**	**-7,881.24**	**115**
63000		SHOP					
	410	POWER	94.34	1,469.59	1,500.00	30.41	98
	432	BUILDING REPAIR/MAINT.			550.00	550.00	
	612	SHOP SUPPLIES	123.55	526.81		-526.81	
	670	MISC. TOOLS	64.99	1,153.57		-1,153.57	
		Total Account	**282.88**	**3,149.97**	**2,050.00**	**-1,099.97**	**154**
65000		EQUIPTMENT EXPENSE					
	625	VEHICLE/ EQUIP. LICENSING			30.00	30.00	
	626	VEHICLE GAS EXPENSE	1,094.79	10,398.46	13,500.00	3,101.54	77
	627	VEHICLE MISC. PARTS/REPAIRS	82.97	882.42	3,200.00	2,317.58	28
	628	DIESEL EXPENSE		2,179.76	1,275.00	-904.76	171
	629	BOBCAT MISC. EXPENSE			530.00	530.00	
	670	MISC. TOOLS		319.99	1,100.00	780.01	29
	680	MISC. EQUIPMENT			6,500.00	6,500.00	
	681	MISC. EQUIPMENT EXP	474.76	565.75	40,000.00	39,434.25	1
		Total Account	**1,652.52**	**14,346.38**	**66,135.00**	**51,788.62**	**22**
68000		OFFICE BUILDING EXPENSE					
	410	POWER	80.37	725.75	2,000.00	1,274.25	36
	411	PROPANE	334.22	1,799.62	5,100.00	3,300.38	35
	420	CLEANING EXP.		120.00	750.00	630.00	16
	423	TRASH EXP.			300.00	300.00	
	430	REPAIR & MAINT	131.52	744.02	1,000.00	255.98	74
	460	SEWER & WATER EXP.	69.18	834.28	1,000.00	165.72	83
	664	MISC. EXPENSE		2,966.42	550.00	-2,416.42	539
		Total Account	**615.29**	**7,190.09**	**10,700.00**	**3,509.91**	**67**

1 GENERAL FUND

Account Object	Description	Current Month	Current YTD	Budget	Variance	%
	Total Expenses	**78,447.12**	**1,163,345.57**	**1,383,840.00**	**220,494.43**	**84**
	Net Income from Operations	126,654.26	1,140,544.16			
Other Revenue						
36000	MISC. INCOME	668.12	2,620.04		2,620.04	
	Total Other Revenue	**668.12**	**2,620.04**	**0.00**	**2,620.04**	
	Net Income	127,322.38	1,143,164.20			

2 CAPITAL IMPROVEMENT

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			--- Current Year ---				
Revenue							
35500		C.OF DONN. INTERC/S.L.CAP.		6,000.00	2,000.00	4,000.00	300
35510		SEWER INTERC/LINE CAP.FEES		115,200.00	18,000.00	97,200.00	640
35511		C. OF DONNELLY S.A.F. SWR		24,000.00	7,000.00	17,000.00	343
35520		SEWER S.A.F. GENERAL FEES		499,440.00	84,000.00	415,440.00	595
35530		WATER INTERC/LINE CAP FEES		1,500.00	10,000.00	-8,500.00	15
35540		WATER SERVICE AVAIL. FEE		42,000.00	42,000.00		100
35602		STEP TANKS/LIDS/RISERS			18,600.00	-18,600.00	
35603		SEPTAGE RECEIVING FACILTIY		50,000.00	85,000.00	-35,000.00	59
							277
		Total Revenue	**0.00**	**738,140.00**	**266,600.00**	**471,540.00**	**277**
Expenses							
51100		LAND APPLICATION					
	730	CAPITAL IMPROVEMENT			40,000.00	40,000.00	
	732	CAP.IMP. AREAT/IRRIG.PLANT-EXP			1,200.00	1,200.00	
		Total Account			**41,200.00**	**41,200.00**	
51200		MBR Headworks					
	730	CAPITAL IMPROVEMENT			6,700.00	6,700.00	
		Total Account			**6,700.00**	**6,700.00**	
51300		MBR PLANT					
	730	CAPITAL IMPROVEMENT		97,297.00	135,000.00	37,703.00	72
		Total Account		**97,297.00**	**135,000.00**	**37,703.00**	**72**
52000		LIFT STATION					
	730	CAPITAL IMPROVEMENT			10,700.00	10,700.00	
	738	CAP IMP-LS PUMPS		7,457.36		-7,457.36	
		Total Account		**7,457.36**	**10,700.00**	**3,242.64**	**70**
52100		CITY OF DONNELLY					
	730	CAPITAL IMPROVEMENT			8,500.00	8,500.00	
	735	CAP. IMP. SEWER INTERCEPTOR FEE			1,600.00	1,600.00	
		Total Account			**10,100.00**	**10,100.00**	
53000		SEWER					
	730	CAPITAL IMPROVEMENT	1,449.00	23,590.18	19,360.00	-4,230.18	122
	731	CAP.IMP SEPTAGE REC FACILITY		554,800.00	200,000.00	-354,800.00	277
	733	CAP.IMP. STEP TANK PARTS			1,600.00	1,600.00	
	735	CAP. IMP. SEWER INTERCEPTOR FEE			5,000.00	5,000.00	
		Total Account	**1,449.00**	**578,390.18**	**225,960.00**	**-352,430.18**	**256**
57000		WATER					
	730	CAPITAL IMPROVEMENT			7,500.00	7,500.00	

2 CAPITAL IMPROVEMENT

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			--- Current Year ---				
	736	CAP. IMP. WATER INTERCEPTOR FEE			5,000.00	5,000.00	
		Total Account			**12,500.00**	**12,500.00**	
57100		TAMARACK					
	730	CAPITAL IMPROVEMENT	1,060.32	2,131.64	6,400.00	4,268.36	33
		Total Account	**1,060.32**	**2,131.64**	**6,400.00**	**4,268.36**	**33**
61000		OFFICE					
	730	CAPITAL IMPROVEMENT		36,473.75	46,000.00	9,526.25	79
		Total Account		**36,473.75**	**46,000.00**	**9,526.25**	**79**
62000		GENERAL					
	737	CAP IMP MASTER PLAN		58,541.00		-58,541.00	
		Total Account		**58,541.00**		**-58,541.00**	
65000		EQUIPTMENT EXPENSE					
	730	CAPITAL IMPROVEMENT			45,650.00	45,650.00	
		Total Account			**45,650.00**	**45,650.00**	
68000		OFFICE BUILDING EXPENSE					
	730	CAPITAL IMPROVEMENT			4,250.00	4,250.00	
		Total Account			**4,250.00**	**4,250.00**	
		Total Expenses	**2,509.32**	**780,290.93**	**544,460.00**	**-235,830.93**	**143**
		Net Income from Operations	-2,509.32	-42,150.93			
		Net Income	-2,509.32	-42,150.93			

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
		Revenue					
30500		TAX		262,364.31	249,500.00	12,864.31	105
30600		WATER	12,446.00	140,747.70	132,500.00	8,247.70	106
30700		TAMARACK WATER	24,873.60	293,212.90	269,000.00	24,212.90	109
31000		SEWER	103,436.40	1,227,896.65	1,178,000.00	49,896.65	104
31100		CITY OF DONNELLY SEWER	8,400.00	92,400.00	100,700.00	-8,300.00	92
31500		INTEREST INCOME	11,569.49	37,466.35	25,000.00	12,466.35	150
31510		OLD LCF INT INCOME-DIST.		185.52		185.52	
31520		OLD NL INT INCOME - DIST.		194.44		194.44	
32000		PENALTY	1,926.43	13,086.92		13,086.92	
32100		BILLING FEES	330.38	65,802.67	38,680.00	27,122.67	170
32200		TAMAR.II LID BILLING FEES	5,892.53	5,892.53	2,940.00	2,952.53	200
32201		TAMAR.III LID BILLING FEES	34,227.50	34,227.50	18,597.00	15,630.50	184
32202		TAMAR.III LID 2% PENALTY	10,749.25	10,749.24		10,749.24	
32300		TAMAR. I LID BILLING FEES	8,616.14	8,616.14	5,696.00	2,920.14	151
32400		WAGON WHEEL LID BILL. FEES	886.08	886.08	1,100.00	-213.92	81
32700		MM/WM LID BILLING FEES			457.00	-457.00	
32800		DAYSTAR WATER LID BILLING FEE	808.45	808.45	825.00	-16.55	98
32900		LCR LID BILLING FEES			215.00	-215.00	
32910		W.SIDE LID BILLING FEES	10,930.68	10,930.68	11,390.00	-459.32	96
33000		INSPECTION FEES SEWER	200.00	8,450.00	4,000.00	4,450.00	211
33100		INSPECTION FEES WATER	150.00	2,100.00	1,250.00	850.00	168
33200		WATER TURN ON/OFF FEE			250.00	-250.00	
34000		ANNEX/PLAN REVIEW		8,400.00	5,000.00	3,400.00	168
35100		J&R/HONEY D/ASAP SEPTAGE	12,906.41	123,716.92	85,000.00	38,716.92	146
35200		G&S PROP.-L.S. OPER. FEE			1,500.00	-1,500.00	
35600		NEW DEVELOPMENT FEES		35,698.32		35,698.32	
							112
		Total Revenue	**248,349.34**	**2,383,833.32**	**2,131,600.00**	**252,233.32**	**112**
		Expenses					
50100		AERATION/IRRIGATION PLANT					
	426	WEED CONTROL			450.00	450.00	
	430	REPAIR & MAINT			6,600.00	6,600.00	
	432	BUILDING REPAIR/MAINT.		5.55	1,000.00	994.45	1
	680	MISC. EQUIPMENT			1,000.00	1,000.00	
		Total Account		**5.55**	**9,050.00**	**9,044.45**	
51100		LAND APPLICATION					
	425	SPRINKLER REP/PART		45.21	1,500.00	1,454.79	3
	613	CHEMICALS		11,143.19	12,000.00	856.81	93
	617	PUMP/ FLOWMETER EXPENSE		148.38	5,000.00	4,851.62	3
	618	CLOR. SYS REPAIR/PARTS		97.71	6,000.00	5,902.29	2
	664	MISC. EXPENSE		213.15	1,750.00	1,536.85	12

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
				Current Year			
		Total Account		**11,647.64**	**26,250.00**	**14,602.36**	**44**
51200		MBR Headworks					
	412	HEATER FUEL	2,142.51	3,895.33	500.00	-3,395.33	779
	431	PARTS		98.35	5,000.00	4,901.65	2
	432	BUILDING REPAIR/MAINT.	3,136.00	13,580.94	15,000.00	1,419.06	91
	433	TRANSFER BUILDING PARTS			600.00	600.00	
	730	CAPITAL IMPROVEMENT		45,100.00		-45,100.00	
		Total Account	**5,278.51**	**62,674.62**	**21,100.00**	**-41,574.62**	**297**
51230		SCADA SYSTEM					
	467	SCADA SYSTEM REPAIR		457.50	1,000.00	542.50	46
		Total Account		**457.50**	**1,000.00**	**542.50**	**46**
51300		MBR PLANT					
	334	COMP. SUPPORT & ESET VIRUS		1,996.83	1,500.00	-496.83	133
	410	POWER	6,728.75	84,337.87	90,000.00	5,662.13	94
	420	CLEANING EXP.		35.51		-35.51	
	424	DUMPSTER DISPOSAL	216.69	2,118.43	1,500.00	-618.43	141
	431	PARTS	1,720.76	3,041.55	15,000.00	11,958.45	20
	432	BUILDING REPAIR/MAINT.	3,116.60	11,174.15	10,000.00	-1,174.15	112
	451	CONTRACT OPER. EXP	2,000.00	24,000.00	24,000.00		100
	530	TELEPHONE	136.15	1,466.04	3,300.00	1,833.96	44
	611	WATER	53.43	488.15	600.00	111.85	81
	613	CHEMICALS	1,911.58	6,307.03	5,000.00	-1,307.03	126
	614	TESTING	231.99	3,666.81	13,500.00	9,833.19	27
	615	POND TEST/MISC EXP		4,550.00	1,200.00	-3,350.00	379
	628	DIESEL EXPENSE			2,500.00	2,500.00	
	652	CERTIF/PERMIT/LICENSES	100.00	1,486.70	1,500.00	13.30	99
	655	ZENON (SUEZ) SUPPORT			1,500.00	1,500.00	
	660	OFFICE EXPENSE	7.29	1,456.20	1,150.00	-306.20	127
	664	MISC. EXPENSE	725.00	2,904.55	2,000.00	-904.55	145
	670	MISC. TOOLS	87.94	545.53	500.00	-45.53	109
	680	MISC. EQUIPMENT	687.67	2,226.22	22,000.00	19,773.78	10
		Total Account	**17,723.85**	**151,801.57**	**196,750.00**	**44,948.43**	**77**
51400		RI BASIN					
	422	SNOW REMOVAL			500.00	500.00	
	664	MISC. EXPENSE			50,000.00	50,000.00	
		Total Account			**50,500.00**	**50,500.00**	
52000		LIFT STATION					
	410	POWER	1,709.07	22,069.08	26,000.00	3,930.92	85
	411	PROPANE		1,390.83	2,500.00	1,109.17	56
	422	SNOW REMOVAL		5,460.00	10,000.00	4,540.00	55
	430	REPAIR & MAINT	1,265.00	23,248.68	30,000.00	6,751.32	77
	434	BUILDINGS MISC. EXP			7,000.00	7,000.00	
	464	CLEAN LINES		22,809.25	22,000.00	-809.25	104
	530	TELEPHONE	843.01	9,086.62	11,000.00	1,913.38	83

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			-------------------	Current Year	-------------------		
		Total Account	**3,817.08**	**84,064.46**	**108,500.00**	**24,435.54**	**77**
52100		CITY OF DONNELLY					
	410	POWER	73.14	1,009.35	1,500.00	490.65	67
	430	REPAIR & MAINT			1,000.00	1,000.00	
	431	PARTS			2,500.00	2,500.00	
	461	SEWER SERV. LINE REPAIR/MAINT.			3,000.00	3,000.00	
	462	MANHOLE REPAIR & PARTS			4,000.00	4,000.00	
	464	CLEAN LINES		800.00	4,500.00	3,700.00	18
	656	LAND LEASE AGREEMENT		750.00	750.00		100
		Total Account	**73.14**	**2,559.35**	**17,250.00**	**14,690.65**	**15**
53000		SEWER					
	441	STORAGE BUILDING		1,500.00	1,000.00	-500.00	150
	452	DIGLINE LOCATE EXPENSE	80.41	826.57	1,000.00	173.43	83
	461	SEWER SERV. LINE REPAIR/MAINT.		815.00	6,500.00	5,685.00	13
	462	MANHOLE REPAIR & PARTS		121.88	25,000.00	24,878.12	
	463	SEWER REPAIRS - SPRING RUN OFF			200,000.00	200,000.00	
	468	DISTRICT EXP. - RAISE MANHOLES			5,000.00	5,000.00	
	469	COLLECTION SYSTEM REPAIR & PARTS	8,594.85	35,597.72	76,500.00	40,902.28	47
		Total Account	**8,675.26**	**38,861.17**	**315,000.00**	**276,138.83**	**12**
57000		WATER					
	422	SNOW REMOVAL		920.00	1,600.00	680.00	58
	430	REPAIR & MAINT	671.98	695.93	2,000.00	1,304.07	35
	431	PARTS	15,037.36	17,670.42	2,500.00	-15,170.42	707
	432	BUILDING REPAIR/MAINT.		329.97	500.00	170.03	66
	470	SERVICE LINE REPAIR/PARTS		553.49	1,600.00	1,046.51	35
	471	HYDRANT REPAIR/PARTS		167.49	3,000.00	2,832.51	6
	472	HYDRANT SERVICE MARKERS			2,125.00	2,125.00	
	530	TELEPHONE	31.40	294.62	350.00	55.38	84
	613	CHEMICALS		7,729.02	9,000.00	1,270.98	86
	614	TESTING	92.00	9,229.84	4,700.00	-4,529.84	196
	616	METERS & PARTS		73.86	1,000.00	926.14	7
	652	CERTIF/PERMIT/LICENSES		2,390.00	1,500.00	-890.00	159
		Total Account	**15,832.74**	**40,054.64**	**29,875.00**	**-10,179.64**	**134**
57100		TAMARACK					
	332	NEW DEVELOPEMENT ENGINEERING EXP.			2,500.00	2,500.00	
	430	REPAIR & MAINT		46,239.70	2,000.00	-44,239.70	2312
	431	PARTS	11.95	22.57	6,500.00	6,477.43	
	432	BUILDING REPAIR/MAINT.	24.22	223.98	1,500.00	1,276.02	15
	470	SERVICE LINE REPAIR/PARTS		30.47	2,500.00	2,469.53	1
	471	HYDRANT REPAIR/PARTS			2,500.00	2,500.00	
	613	CHEMICALS		9,388.05	4,750.00	-4,638.05	198
	614	TESTING	19.00	3,779.32	1,000.00	-2,779.32	378
	616	METERS & PARTS			1,500.00	1,500.00	
	652	CERTIF/PERMIT/LICENSES		1,412.00	1,000.00	-412.00	141
		Total Account	**55.17**	**61,096.09**	**25,750.00**	**-35,346.09**	**237**

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
57200		DAY STAR WELL					
	410	POWER	419.01	4,833.61	4,167.00	-666.61	116
		Total Account	**419.01**	**4,833.61**	**4,167.00**	**-666.61**	**116**
57300		FIR GROVE WELL					
	410	POWER	562.92	5,040.93	4,167.00	-873.93	121
		Total Account	**562.92**	**5,040.93**	**4,167.00**	**-873.93**	**121**
57400		HAWKS BAY WELL					
	410	POWER	416.37	4,357.03	4,166.00	-191.03	105
		Total Account	**416.37**	**4,357.03**	**4,166.00**	**-191.03**	**105**
61000		OFFICE					
	334	COMP. SUPPORT & ESET VIRUS		10,799.63	12,500.00	1,700.37	86
	410	POWER	96.89	1,097.06	1,500.00	402.94	73
	411	PROPANE	482.96	4,016.19	3,000.00	-1,016.19	134
	420	CLEANING EXP.		150.00	600.00	450.00	25
	423	TRASH EXP.	101.47	436.14	300.00	-136.14	145
	520	I.C.R.M.P.-LIAB. & OTHER INS		24,824.00	25,000.00	176.00	99
	531	CELL TELEPHONE/INTERNET	531.19	5,352.18	8,000.00	2,647.82	67
	540	PUBLISHING			500.00	500.00	
	541	PRINTING/COPYING EXP.			300.00	300.00	
	542	DUES & SUBSCRIPTIONS	153.07	2,048.76	250.00	-1,798.76	820
	543	LEGAL RECORDINGS			300.00	300.00	
	580	TRAVEL		1,038.87	250.00	-788.87	416
	581	MILEAGE EXPENSE	470.63	535.00	250.00	-285.00	214
	590	TRAINING			250.00	250.00	
	610	SUPPLIES	11.89	2,581.72	5,000.00	2,418.28	52
	650	BANK FEES	407.20	4,212.37	7,500.00	3,287.63	56
	651	BONDING EXPENSE		175.00	175.00		100
	653	ANNEXATION EXPENSE		1,184.04	10,000.00	8,815.96	12
	661	FORMS/BILLING CARDS/CKS		533.46	10,000.00	9,466.54	5
	662	MAILINGS & POSTAGE		7,439.36	9,500.00	2,060.64	78
	663	MISC. OFFICE EXPENSE		333.19	5,000.00	4,666.81	7
	665	OFFICE EQUIPMENT REPAIR			750.00	750.00	
	680	MISC. EQUIPMENT		49.99		-49.99	
		Total Account	**2,255.30**	**66,806.96**	**100,925.00**	**34,118.04**	**66**
61100		ADMIN					
	110	SALARY- ADMINISTRATIVE	18,247.98	229,850.26	230,000.00	149.74	100
	111	SALARY- MAINTENANCE	19,178.00	195,557.27	290,000.00	94,442.73	67
	220	EMPLR FICA & MEDICARE EXP	2,886.02	32,964.51	40,600.00	7,635.49	81
	260	WORKMAN'S COMP	523.20	5,026.05	8,000.00	2,973.95	63
	290	HEALTH INSURANCE	10,656.00	102,722.85	120,000.00	17,277.15	86
	291	RETIREMENT EXPENSE	4,492.54	51,295.09	66,000.00	14,704.91	78
	292	MAINT CLOTHING ALLOWANCE		1,413.15	1,500.00	86.85	94
	311	BOARD EXPENSE	300.00	5,500.00	7,500.00	2,000.00	73
		Total Account	**56,283.74**	**624,329.18**	**763,600.00**	**139,270.82**	**82**
62000		GENERAL					

1 GENERAL FUND

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			---------- Current Year ----------				
	330	PROF.AUDIT/ACCT.SERV/PREP.W-2		7,500.00	7,800.00	300.00	96
	331	PROF. ENGINEERING SERVICES	9,265.00	60,983.75	35,000.00	-25,983.75	174
	333	ATTORNEY FEES	797.50	5,232.50	25,000.00	19,767.50	21
	335	FACILITIES PLANNING STUDIES			15,000.00	15,000.00	
	690	MISC. OVERPAYMENT - REFUNDS		1,108.00		-1,108.00	
		Total Account	**10,062.50**	**74,824.25**	**82,800.00**	**7,975.75**	**90**
63000		SHOP					
	410	POWER	197.16	1,784.42	2,000.00	215.58	89
	432	BUILDING REPAIR/MAINT.			500.00	500.00	
	612	SHOP SUPPLIES		279.50		-279.50	
	670	MISC. TOOLS		1,250.16		-1,250.16	
		Total Account	**197.16**	**3,314.08**	**2,500.00**	**-814.08**	**133**
65000		EQUIPTMENT EXPENSE					
	625	VEHICLE/ EQUIP. LICENSING			100.00	100.00	
	626	VEHICLE GAS EXPENSE	896.95	11,860.21	14,000.00	2,139.79	85
	627	VEHICLE MISC. PARTS/REPAIRS	245.49	1,503.22	5,000.00	3,496.78	30
	628	DIESEL EXPENSE	714.17	1,101.60	2,500.00	1,398.40	44
	629	BOBCAT MISC. EXPENSE			1,000.00	1,000.00	
	670	MISC. TOOLS		19.42	1,500.00	1,480.58	1
	680	MISC. EQUIPMENT		103.80	5,000.00	4,896.20	2
	681	MISC. EQUIPMENT EXP		567.39	25,000.00	24,432.61	2
		Total Account	**1,856.61**	**15,155.64**	**54,100.00**	**38,944.36**	**28**
68000		OFFICE BUILDING EXPENSE					
	411	PROPANE		561.41		-561.41	
	430	REPAIR & MAINT	590.29	5,168.61	1,500.00	-3,668.61	345
	460	SEWER & WATER EXP.	70.48	842.56	1,000.00	157.44	84
	664	MISC. EXPENSE	106.33	1,309.88	2,500.00	1,190.12	52
		Total Account	**767.10**	**7,882.46**	**5,000.00**	**-2,882.46**	**158**
		Total Expenses	**124,276.46**	**1,259,766.73**	**1,822,450.00**	**562,683.27**	**69**
		Net Income from Operations	124,072.88	1,124,066.59			
Other Revenue							
36000		MISC. INCOME	3,360.39	3,715.39		3,715.39	
		Total Other Revenue	**3,360.39**	**3,715.39**	**0.00**	**3,715.39**	

1 GENERAL FUND

		Current Year				
Account Object	Description	Current Month	Current YTD	Budget	Variance	%
	Net Income	127,433.27	1,127,781.98			

2 CAPITAL IMPROVEMENT

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			---- Current Year ----				
Revenue							
35500		C.OF DONN. INTERC/S.L.CAP.		1,500.00	1,500.00		100
35510		SEWER INTERC/LINE CAP.FEES		69,000.00	35,000.00	34,000.00	197
35511		C. OF DONNELLY S.A.F. SWR		6,000.00	6,000.00		100
35520		SEWER S.A.F. GENERAL FEES		246,000.00	90,000.00	156,000.00	273
35530		WATER INTERC/LINE CAP FEES		10,500.00	6,000.00	4,500.00	175
35540		WATER SERVICE AVAIL. FEE		84,000.00	36,000.00	48,000.00	233
35610		SEWER GRANT REIMBURSEMENT	4,503.00	39,758.00		39,758.00	
35620		WATER GRANT REIMBURSEMENT	3,085.00	35,876.00		35,876.00	
							282
		Total Revenue	**7,588.00**	**492,634.00**	**174,500.00**	**318,134.00**	**282**
Expenses							
51100		LAND APPLICATION					
	732	CAP.IMP. AREAT/IRRIG.PLANT-EXP			1,250.00	1,250.00	
		Total Account			**1,250.00**	**1,250.00**	
51200		MBR Headworks					
	730	CAPITAL IMPROVEMENT	360,800.00	360,800.00	7,000.00	-353,800.00	5154
	739	BUILDING UPGRADES	1,915.00	34,470.00		-34,470.00	
		Total Account	**362,715.00**	**395,270.00**	**7,000.00**	**-388,270.00**	**5647**
51300		MBR PLANT					
	730	CAPITAL IMPROVEMENT		112,373.31	135,000.00	22,626.69	83
		Total Account		**112,373.31**	**135,000.00**	**22,626.69**	**83**
52000		LIFT STATION					
	730	CAPITAL IMPROVEMENT		5,595.00	11,000.00	5,405.00	51
		Total Account		**5,595.00**	**11,000.00**	**5,405.00**	**51**
52100		CITY OF DONNELLY					
	730	CAPITAL IMPROVEMENT			8,500.00	8,500.00	
	735	CAP. IMP. SEWER INTERCEPTOR FEE			1,600.00	1,600.00	
		Total Account			**10,100.00**	**10,100.00**	
53000		SEWER					
	730	CAPITAL IMPROVEMENT	4,631.50	44,651.90	275,000.00	230,348.10	16
	735	CAP. IMP. SEWER INTERCEPTOR FEE			5,000.00	5,000.00	
	737	CAP IMP MASTER PLAN	13,670.00	93,559.00		-93,559.00	
		Total Account	**18,301.50**	**138,210.90**	**280,000.00**	**141,789.10**	**49**
57000		WATER					
	730	CAPITAL IMPROVEMENT		558.52	15,000.00	14,441.48	4
	736	CAP. IMP. WATER INTERCEPTOR FEE			5,000.00	5,000.00	
	737	CAP IMP MASTER PLAN	4,138.00	75,515.00		-75,515.00	

2 CAPITAL IMPROVEMENT

Account	Object	Description	Current Month	Current YTD	Budget	Variance	%
			Current Year				
		Total Account	**4,138.00**	**76,073.52**	**20,000.00**	**-56,073.52**	**380**
57100		TAMARACK					
	730	CAPITAL IMPROVEMENT			6,400.00	6,400.00	
		Total Account			**6,400.00**	**6,400.00**	
61000		OFFICE					
	730	CAPITAL IMPROVEMENT		649.00		-649.00	
		Total Account		**649.00**		**-649.00**	
62000		GENERAL					
	737	CAP IMP MASTER PLAN		30,759.00		-30,759.00	
		Total Account		**30,759.00**		**-30,759.00**	
65000		EQUIPMENT EXPENSE					
	730	CAPITAL IMPROVEMENT			12,900.00	12,900.00	
		Total Account			**12,900.00**	**12,900.00**	
		Total Expenses	**385,154.50**	**758,930.73**	**483,650.00**	**-275,280.73**	**157**
		Net Income from Operations	-377,566.50	-266,296.73			
		Net Income	-377,566.50	-266,296.73			

APPENDIX D

Collections CIP Summary Sheets

Client:	NLRSWD
Project:	Wastewater Master Plan Update
Project No.:	218102-006
Location:	Meridian Office
Date:	Aug-23
Reviewed By:	JMK

Project ID#	Project Name	Project Trigger	Total Estimated Cost (2023 Dollars)
Priority 1 Improvements (Prior to 5 Years)			
1.1	Pump Station SCADA Improvements	Data information collection and tracking	$1,210,000
1.2	Downstream WW Lake Crossing Gravity Line Improvement	Increase pipeline capacity	$3,872,000
1.3	WW Lake X-ing Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$160,000
1.4	Day/Wagon Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$260,000
1.5	Mtn Shadows Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$140,000
1.6	Mtn Meadows Pump Station Upgrades	Increase pump firm capacity to existing peak flow	$180,000
1.7	Ponderosa Pump Station Upgrades	Correct existing pump redundancy deficiency	$60,000
1.8	Big Smoky Pump Station Upgrades	Correct existing pump redundancy deficiency	$80,000
1.9	Rex/Morning Pump Station Upgrades	Correct existing pump redundancy deficiency	$70,000
1.10	Hawks Bay Pump Station Upgrades	Correct existing pump redundancy deficiency	$69,000
1.11	The Reserve Pump Station Upgrades	Correct existing pump redundancy deficiency	$77,000
1.12	FM Church Camp Pump Station Upgrades	Correct existing pump redundancy deficiency	$30,000
1.13	Tamarack (Discovery, Upper) Pump Station Upgrades	Correct existing pump redundancy deficiency	$25,000
1.14	Pump Station Safety and Security Improvements	Improved system safety and security	$580,000
1.15	Little Lane Pump Station Upgrades	Improved efficiency and operation	$32,000
1.16	Grasmick Pump Station Upgrades	Improved efficiency and operation	$52,000
1.17	Smiling Julie Pump Station Upgrades	Improved efficiency and operation	$16,000
1.18	Camas Pump Station Upgrades	Prevention of backflow	$14,000
1.19	Margot Pump Station Upgrades	Prevention of backflow	$30,000
1.20	Jack's Loop Pump Station Upgrades	Improved level control	$7,000
1.21	Poison Creek Pump Station Upgrades	Improved level control and lifespan	$16,000
1.22	Steelhead Pump Station Upgrades	Improved level control and lifespan	$10,000
		Total Priority 1 Improvements (rounded)	**$6,990,000**
Priority 2 Improvements (Prior to 20 Years)			
2.1	Parallel Force Main to WWTP	Increase conveyance capacity to WWTP	$2,244,000
2.2	Upstream WW Lake Crossing Lift Station Gravity Line Improvement	Increase pipeline capacity	$996,000
2.3	Upstream Day/Wagon Lift Station Gravity Line Improvement	Increase pipeline capacity	$5,324,000
2.4	Pump Station Air Release Valve Improvements	Improve pipe pressures	$150,000
2.5	Pump Station Flow Monitoring Improvements	Improved efficiency, operation, and management	$1,400,000
2.6	Pump Station Gauge Improvements	Improved efficiency and operation	$180,000
2.7	Pump Station Backup Power Improvements (Transfer Switches Only)	Improved reliability and emergency coverage	$620,000
2.8	20-Yr WW Lake X-ing Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$1,750,000
2.9	20-Yr Ponderosa Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$220,000
2.10	20-Yr Big Smoky Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$1,750,000
2.11	20-Yr Rex/Morning Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.12	20-Yr Jack's Loop Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.13	20-Yr Hawks Bay Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$208,000
2.14	20-Yr Poison Creek Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$894,000
2.15	20-Yr Smiling Julie Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$110,000
2.16	Fir Grove Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$144,000
2.17	Day Star Lake X-ing Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$122,000
2.18	Arrowhead Pump Station Upgrades	Increase pump firm capacity to 20-yr peak flow	$20,000
2.19	Hillhouse Pump Station Upgrades	Replacement of worn components	$46,000
2.20	RR Village Pump Station Upgrades	Replacement of worn components	$11,800
2.21	Lake Forest Pump Station Upgrades	Improved efficiency and operation	$3,000
2.22	Meadows (West Mtn) Pump Station Upgrades	Improved efficiency and operation	$15,000
		Total Priority 2 Improvements (rounded)	**$16,427,800**
		TOTAL SYSTEM IMPROVEMENTS COSTS (rounded)	**$23,417,800**

1. The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented herein.
2. Federal funding requirements (i.e. AIS) were not included in costs and if this type of funding is utilized it is recommended cost estimates be revisited.

NLRSWD

WWTP Facility Planning Study

Project Title: Pump Station SCADA Improvements

Project Identifier: 1.1

Need for Project:
- Lack of SCADA connection at all pump stations

Objective:
- Improve ease of pump station operation and data information tracking and collection

Design Considerations:
- SCADA Master Plan and implementation

Location:

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
SCADA Integration (including cellular connection)	1	LS	$600,000	$ 600,000	
				Construction Subtotal	***$ 600,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 60,000	
Bonding			3%	$ 15,000	
Contractor Overhead and Profit			15%	$ 90,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 180,000	
				Total Construction Subtotal	***$ 945,000***
Plans and Contract Documents					
SCADA Master Plan			LS	$ 150,000	
Engineering Design and Bid Phase Services			15%	$ 142,000	
Engineering - Construction Contract Administration			5%	$ 47,000	
Engineering - Inspection			5%	$ 47,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			5%	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 28,000	
				Total Project Costs (rounded)	**$ 1,210,000**

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

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

NLRSWD

WWTP Facility Planning Study

Project Title: Downstream WW Lake Crossing Gravity Line Improvement Project Identifier: 1.2	**Location: Dawn Dr, Sandy Dr, Deedee Ln**
<u>Need for Project:</u> - The existing trunkline does not have adequate capacity to convey flows <u>Objective:</u> - Increase the capacity of the existing line <u>Design Considerations:</u> - Routing and separation requirements with other utilities - Full lane replacement is assumed - Construction assumed to take 45 days	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
18-inch Pipe - Excavation, Backfill	4,100	LF	$ 263	$ 1,076,700	
Manholes (60")	21	EA	$ 16,089	$ 337,900	
Full Lane Pavement Repair	4,100	LF	$ 101	$ 414,100	
Traffic Control - With Flagging	4,100	LF	$ 9	$ 37,700	
Bypass Pumping	45	/DAY	$ 800	$ 36,000	
				Construction Subtotal	***$ 1,902,400***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 190,200	
Bonding			2.5%	$ 47,600	
Contractor Overhead and Profit			15%	$ 285,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 570,700	
				Total Construction Subtotal	***$ 2,997,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 450,000	
Engineering - Construction Contract Administration			5%	$ 149,900	
Engineering - Inspection			5%	$ 149,900	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 20,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			3%	$ 90,000	
				Total Project Costs (rounded)	**$ 3,872,000**

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

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

NLRSWD

WWTP Facility Planning Study

Project Title: WW Lake X-ing Pump Station Upgrades
Project Identifier: 1.3

Location: Hereford Rd. & Longhorn Way

Need for Project:
- Firm capacity of pumps is exceeded

Objective:
- Increase pump firm capacity to handle existing peak flows

Design Considerations:
- Intent is to phase pump capacity to 20-year peak inflow capacity
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 475 gpm Pumps	2	EA	$25,000	$ 50,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
				Construction Subtotal	***$ 75,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 7,500	
Bonding			2.5%	$ 1,900	
Contractor Overhead and Profit			15%	$ 11,300	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 23,000	
				Total Construction Subtotal	***$ 119,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 18,000	
Engineering - Construction Contract Administration			5%	$ 6,000	
Engineering - Inspection			5%	$ 6,000	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 3,600	
				Total Project Costs (rounded)	**$ 160,000**

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

WWTP Facility Planning Study

Project Title: Day/Wagon Pump Station Upgrades Project Identifier: 1.4	**Location: Hereford Rd.**

Need for Project:
- Firm capacity of pumps is exceeded

Objective:
- Improve operations at pump station and and increase pump firm capacity to handle existing and future peak flows

Design Considerations:
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Install Camlock Cap	1	EA	$1,000	$ 1,000	
Replace Existing Pumps with 650 gpm Pumps	2	EA	$30,000	$ 60,000	
Mechanical Upgrades	1	LS	$40,000	$ 40,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
				Construction Subtotal	***$ 126,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 12,600	
Bonding			2.5%	$ 3,200	
Contractor Overhead and Profit			15%	$ 18,900	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 38,000	
				Total Construction Subtotal	***$ 199,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 30,000	
Engineering - Construction Contract Administration			5%	$ 10,000	
Engineering - Inspection			5%	$ 10,000	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 6,000	
				Total Project Costs (rounded)	**$ 260,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Mtn Shadows Pump Station Upgrades

Project Identifier: 1.5

Location: Shadows Trail

Need for Project:
- Poor space and safety as site access is right in the road. Firm capacity of pumps is exceeded

Objective:
- Improve site protection and safety. Increase pump firm capacity to handle existing and future peak flows

Design Considerations:
- Wet well hatch blocks electrical panel
- Site is located right next to road; construction equipment may protrude into road
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 180 gpm Pumps	2	EA	$12,000	$ 24,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
Modify Access to Improve Safety	1	EA	$15,000	$ 15,000	
				Construction Subtotal	***$ 64,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 6,400	
Bonding			2.5%	$ 1,600	
Contractor Overhead and Profit			15%	$ 10,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 19,000	
				Total Construction Subtotal	***$ 101,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 15,000	
Engineering - Construction Contract Administration			5%	$ 5,100	
Engineering - Inspection			5%	$ 5,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			5%	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 3,000	
				Total Project Costs (rounded)	**$ 140,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Mtn Meadows Pump Station Upgrades Project Identifier: 1.6	**Location: Cameron Dr.**

Need for Project:
- Poor space and safety as site access is right in the road. Firm capacity of pumps is exceeded

Objective:
- Improve site protection and safety. Increase pump firm capacity to handle existing and future peak flows

Design Considerations:
- Assumes available fall protection just needs to be connected/clipped in
- Site is located right next to road; construction equipment may protrude into road
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 380 gpm Pumps	2	EA	$22,500	$ 45,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
Modify Access to Improve Safety	1	EA	$15,000	$ 15,000	
				Construction Subtotal	***$ 85,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 8,500	
Bonding			2.5%	$ 2,100	
Contractor Overhead and Profit			15%	$ 12,800	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 25,500	
				Total Construction Subtotal	***$ 134,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 20,000	
Engineering - Construction Contract Administration			5%	$ 6,700	
Engineering - Inspection			5%	$ 6,700	
Geotechnical Investigation			LS	$ -	
SCADA Integration			5%	$ 5,000	
Surveying			LS	$ 2,000	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 4,000	
				Total Project Costs (rounded)	**$ 180,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Ponderosa Pump Station Upgrades Project Identifier: 1.7	**Location: Ponderosa Dr.**

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station and address pump redundancy issue

Design Considerations:
- Assumes all interior pipe/supports are corroded needing replacement
- Assumes bypass pump provisions located on site are in working order and just need to be reinstalled
- Space for 3 pumps
- Assumes the inspection of pump 2 will result in impeller and bearing replacements

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Pump 2 Impeller and Bearings	1	EA	$6,500	$ 6,500	
Pipe and Support Replacement	1	LS	$18,000	$ 18,000	
Reinstall Bypass Pump Provisions	1	EA	$2,500	$ 2,500	
Wire Manual Transfer Switch (after addition of portable generator connection)	1	EA	$1,000	$ 1,000	
				Construction Subtotal	***$ 28,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 2,800	
Bonding			2.5%	$ 700	
Contractor Overhead and Profit			15%	$ 4,200	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 8,000	
				Total Construction Subtotal	***$ 44,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 7,000	
Engineering - Construction Contract Administration			5%	$ 2,200	
Engineering - Inspection			5%	$ 2,200	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 1,300	
				Total Project Costs (rounded)	**$ 60,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Big Smoky Pump Station Upgrades
Project Identifier: 1.8

Location: Patty Dr.

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station and address pump redundancy issue

Design Considerations:
- Assumes all interior pipe/supports are corroded needing replacement

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Remove and Replace Pump 2	1	EA	$20,000	$ 20,000	
Pipe and Support Replacement	1	LS	$18,000	$ 18,000	
				Construction Subtotal	***$ 38,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 3,800	
Bonding			2.5%	$ 1,000	
Contractor Overhead and Profit			15%	$ 5,700	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 11,000	
				Total Construction Subtotal	***$ 60,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 9,000	
Engineering - Construction Contract Administration			5%	$ 3,000	
Engineering - Inspection			5%	$ 3,000	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 1,800	
				Total Project Costs (rounded)	**$ 80,000**

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Project Title: Rex/Morning Pump Station Upgrades

Project Identifier: 1.9

Location: Morning Dr.

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station and address pump redundancy issue

Design Considerations:
- May be a pump removal problem due to the placement of the level sensor
- Removal/reinstallation of sensor likely needed

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Remove and Replace Pump 1	1	EA	$20,000	$ 20,000	
Removal/Reinstallation of Level Sensor	1	EA	$2,500	$ 2,500	
Grout Rehabilitation	50	SF	$125	$ 6,300	
Replace Wet Well Safety Latch	1	EA	$500	$ 500	
				Construction Subtotal	***$ 29,300***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 2,900	
Bonding			2.5%	$ 700	
Contractor Overhead and Profit			15%	$ 4,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 9,000	
				Total Construction Subtotal	***$ 47,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 7,000	
Engineering - Construction Contract Administration			5%	$ 2,400	
Engineering - Inspection			5%	$ 2,400	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 1,400	
				Total Project Costs (rounded)	**$ 70,000**

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

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WWTP Facility Planning Study

Project Title: Hawks Bay Pump Station Upgrades Project Identifier: 1.10	**Location: Hawks Bay Rd. & Tamarack Falls Rd.**
Need for Project: - Install necessary pump station items and complete needed upgrades that come with wear over time Objective: - Improve operations at pump station and address pump sizing/redundancy issues Design Considerations: - Assumes all interior pipe/supports are corroded needing replacement - 1 oversized pump and 1 jockey pump - Room for 3 pumps; considering replacing oversized pump and adding a second pump and removing the undersized jockey pump	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Pipe and Support Replacement	1	LS	$18,000	$ 18,000	
Replace or Modify Pump for System	2	EA	$7,500	$ 15,000	
				Construction Subtotal	***$ 33,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 3,300	
Bonding			2.5%	$ 800	
Contractor Overhead and Profit			15%	$ 5,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 10,000	
				Total Construction Subtotal	***$ 53,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 8,000	
Engineering - Construction Contract Administration			5%	$ 2,700	
Engineering - Inspection			5%	$ 2,700	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 2,000	
				Total Project Costs (rounded)	**$ 69,000**

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

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WWTP Facility Planning Study

Project Title: The Reserve Pump Station Upgrades Project Identifier: 1.11	**Location: Kantola Rd. & Lee Way**

Need for Project:
- Install necessary pump station items and complete needed upgrades

Objective:
- Improve operations at pump station and address pump redundancy and ground stability issues

Design Considerations:
- The site floods each spring; plan construction accordingly

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Vault Leakage Repair	1	EA	$3,000	$ 3,000	
Site Ground Improvements	1	LS	$10,000	$ 10,000	
Conduit Installation	1	EA	$5,000	$ 5,000	
Install Second Pump	1	EA	$20,000	$ 20,000	
				Construction Subtotal	***$ 38,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 3,800	
Bonding			2.5%	$ 1,000	
Contractor Overhead and Profit			15%	$ 5,700	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 11,400	
				Total Construction Subtotal	***$ 60,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 9,000	
Engineering - Construction Contract Administration			5%	$ 3,000	
Engineering - Inspection			5%	$ 3,000	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 2,000	
				Total Project Costs (rounded)	**$ 77,000**

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

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WWTP Facility Planning Study

Project Title: FM Church Camp Pump Station Upgrades Project Identifier: 1.12	**Location: Roseberry Rd.**

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station and address pump redundancy issue

Design Considerations:
- Assumes the inspection of pump 2 will result in impeller and bearing replacements

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Pump 2 Impeller and Bearings	1	EA	$6,500	$ 6,500	
Install Check Valve on Vault Drain	1	EA	$3,000	$ 3,000	
				Construction Subtotal	***$ 9,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 1,000	
Bonding			2.5%	$ 200	
Contractor Overhead and Profit			15%	$ 1,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 3,000	
				Total Construction Subtotal	***$ 16,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 2,000	
Engineering - Construction Contract Administration			5%	$ 800	
Engineering - Inspection			5%	$ 800	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 500	
				Total Project Costs (rounded)	**$ 30,000**

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

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WWTP Facility Planning Study

Project Title: Tamarack (Discovery, Upper) Pump Station Upgrades Project Identifier: 1.13	**Location: Discover Dr.**
Need for Project: - Install necessary pump station items and complete needed upgrades that come with wear over time Objective: - Improve operations at pump station Design Considerations: - Assumes the inspection of pump 2 will result in impeller and bearing replacement	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Pump 2 Impeller and Bearings	1	EA	$6,500	$ 6,500	
Repair Power Meter	1	EA	$5,000	$ 5,000	
				Construction Subtotal	***$ 11,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 1,200	
Bonding			2.5%	$ 300	
Contractor Overhead and Profit			15%	$ 1,700	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 3,500	
				Total Construction Subtotal	***$ 19,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 3,000	
Engineering - Construction Contract Administration			5%	$ 1,000	
Engineering - Inspection			5%	$ 1,000	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 600	
				Total Project Costs (rounded)	**$ 25,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Pump Station Safety and Security Improvements Project Identifier: 1.14	**Location:**
<u>Need for Project:</u> - Lack of fencing, fall protection, and locks at pump stations <u>Objective:</u> - Improve safety and security <u>Design Considerations:</u> - Averaging around 85 LF per site as per Google Earth estimates: - 85 LF x 29 sites = 2,465 rounded up ~2,500 LF of fencing - Assuming half of pump stations also have a vault that needs fall protection installed: - 24 wet wells needing fall protection + (29/2) vaults needing fall protection rounded to nearest whole number = 38 - Assuming all pump stations are missing 1 lock: - 29 locks for every new fence + 29 missing = 58 rounded up ~ 60 locks needed	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Fencing Installation	2,500	LF	$40	$ 100,000	
Fall Protection Installation	38	EA	$5,000	$ 190,000	
High Security Padlock	60	EA	$30	$ 1,800	
				Construction Subtotal	***$ 291,800***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 29,000	
Bonding			2.5%	$ 7,000	
Contractor Overhead and Profit			15%	$ 44,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 88,000	
				Total Construction Subtotal	***$ 460,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 69,000	
Engineering - Construction Contract Administration			5%	$ 23,000	
Engineering - Inspection			5%	$ 23,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			5%	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ -	
				Total Project Costs (rounded)	**$ 580,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Little Lane Pump Station Upgrades Project Identifier: 1.15	**Location: W Mountain Rd.**
Need for Project: - Install necessary pump station items and complete needed upgrades that come with wear over time Objective: - Improve operations at pump station Design Considerations: - Site is located right next to W Mountain Rd.; construction equipment may protrude into road	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Drain and Repair Valve Vault	1	EA	$5,000	$ 5,000	
Replace Damaged Valves	4	EA	$2,500	$ 10,000	
				Construction Subtotal	***$ 15,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 1,500	
Bonding			2.5%	$ 400	
Contractor Overhead and Profit			15%	$ 2,300	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 4,500	
				Total Construction Subtotal	***$ 24,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 4,000	
Engineering - Construction Contract Administration			5%	$ 1,200	
Engineering - Inspection			5%	$ 1,200	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 800	
				Total Project Costs (rounded)	**$ 32,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Grasmick Pump Station Upgrades

Project Identifier: 1.16

Location: W Mountain Rd.

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station and repair mixer to extend life of pumps and wet well

Design Considerations:
-

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Pipe and Support Replacement	1	LS	$18,000	$ 18,000	
Replace Mixer	1	EA	$7,500	$ 7,500	
				Construction Subtotal	***$ 25,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 2,600	
Bonding			0.0%	$ -	
Contractor Overhead and Profit			15%	$ 3,800	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 7,700	
				Total Construction Subtotal	***$ 40,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 6,000	
Engineering - Construction Contract Administration			5%	$ 2,000	
Engineering - Inspection			5%	$ 2,000	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 1,200	
				Total Project Costs (rounded)	**$ 52,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Smiling Julie Pump Station Upgrades

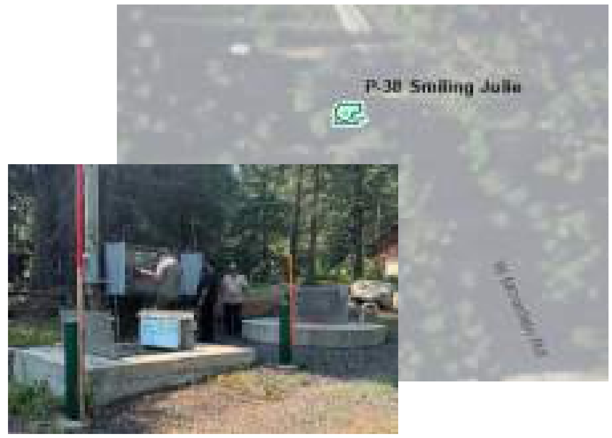
Project Identifier: 1.17

Location: W Mountain Rd.

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station and repair mixer to extend life of pumps and wet well

Design Considerations:
-



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Mixer	1	EA	$7,500	$ 7,500	
				Construction Subtotal	***$ 7,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 800	
Bonding			0.0%	$ -	
Contractor Overhead and Profit			15%	$ 1,100	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 2,300	
				Total Construction Subtotal	***$ 12,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 2,000	
Engineering - Construction Contract Administration			5%	$ 600	
Engineering - Inspection			5%	$ 600	
Geotechnical Investigation			LS	$ -	
SCADA Integration			5%	$ -	
Surveying			LS	$ -	
Environmental & Permitting			5%	$ -	
Legal, Administrative, and Funding			3%	$ 400	
				Total Project Costs (rounded)	**$ 16,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Camas Pump Station Upgrades Project Identifier: 1.18	**Location: Camas Ln.**

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station and prevent possibility of backflow

Design Considerations:
- Wet well hatch blocks control panel

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Broken Check Valve	2	EA	$3,000	$ 6,000	
				Construction Subtotal	***$ 6,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 600	
Bonding			2.5%	$ 200	
Contractor Overhead and Profit			15%	$ 900	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 2,000	
				Total Construction Subtotal	***$ 10,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 2,000	
Engineering - Construction Contract Administration			5%	$ 500	
Engineering - Inspection			5%	$ 500	
Geotechnical Investigation			LS	$ -	
SCADA Integration			5%	$ -	
Surveying			LS	$ -	
Environmental & Permitting			5%	$ -	
Legal, Administrative, and Funding			3%	$ 300	
				Total Project Costs (rounded)	**$ 14,000**

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

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NLRSWD
WWTP Facility Planning Study

Project Title: Margot Pump Station Upgrades

Project Identifier: 1.19

Location: Norwood Rd. & Margot Dr.

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station and prevent backflow

Design Considerations:
- Priority 1 due to strange vibration of pump 1 and suspected broken check valve
- Assumes replacement of broken check valve
- Assumes the inspection of pump 1 will result in impeller and bearing replacements
- Room for 3 pumps

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Broken Check Valve	1	EA	$3,000	$ 3,000	
Replace Pump 1 Impeller and Bearings	1	EA	$6,500	$ 6,500	
Grout Rehabilitation	20	SF	$125	$ 2,500	
				Construction Subtotal	***$ 12,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 1,200	
Bonding			2.5%	$ 300	
Contractor Overhead and Profit			15%	$ 1,800	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 4,000	
				Total Construction Subtotal	***$ 20,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 3,000	
Engineering - Construction Contract Administration			5%	$ 1,000	
Engineering - Inspection			5%	$ 1,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			5%	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 600	
				Total Project Costs (rounded)	**$ 30,000**

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WWTP Facility Planning Study

KELLER ASSOCIATES

Project Title: Jack's Loop Pump Station Upgrades Project Identifier: 1.20	**Location: Jack's Loop**
Need for Project: - Install necessary pump station items and need to be able to accurately control level in wet well Objective: - Improve operations at pump station and address potential level control issues Design Considerations: -	 

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Level Controller	1	EA	$3,000	$ 3,000	
				Construction Subtotal	***$ 3,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 300	
Bonding			2.5%	$ 100	
Contractor Overhead and Profit			15%	$ 500	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 900	
				Total Construction Subtotal	***$ 5,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 1,000	
Engineering - Construction Contract Administration			5%	$ 300	
Engineering - Inspection			5%	$ 300	
Geotechnical Investigation			LS	$ -	
SCADA Integration			5%	$ -	
Surveying			LS	$ -	
Environmental & Permitting			5%	$ -	
Legal, Administrative, and Funding			3%	$ 200	
				Total Project Costs (rounded)	**$ 7,000**

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WWTP Facility Planning Study

Project Title: Poison Creek Pump Station Upgrades

Project Identifier: 1.21

Location: W Mountain Rd.

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations and lifespan at pump station

Design Considerations:
- Existing wooden fence that provides little security
- Overflow connects to a pond that overflows to a nearby creek

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Level Indicator System	1	EA	$2,500	$ 2,500	
Replace Generator Building Siding	1	EA	$5,000	$ 5,000	
				Construction Subtotal	***$ 7,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 800	
Bonding			2.5%	$ 200	
Contractor Overhead and Profit			15%	$ 1,100	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 2,300	
				Total Construction Subtotal	***$ 12,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 2,000	
Engineering - Construction Contract Administration			5%	$ 600	
Engineering - Inspection			5%	$ 600	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 400	
				Total Project Costs (rounded)	**$ 16,000**

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

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WWTP Facility Planning Study

Project Title: Steelhead Pump Station Upgrades

Project Identifier: 1.22

Location: Steelhead Ct.

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station

Design Considerations:
- Limited access to site in winter months
- No site water

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Level Indicator System	1	EA	$2,500	$ 2,500	
Repair Valve Vault Cover	1	EA	$1,500	$ 1,500	
				Construction Subtotal	***$ 4,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 400	
Bonding			2.5%	$ 100	
Contractor Overhead and Profit			15%	$ 600	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 1,200	
				Total Construction Subtotal	***$ 7,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 1,000	
Engineering - Construction Contract Administration			5%	$ 400	
Engineering - Inspection			5%	$ 400	
Geotechnical Investigation			5%	$ -	
SCADA Integration			LS	$ -	
Surveying			5%	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 300	
				Total Project Costs (rounded)	**$ 10,000**

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WWTP Facility Planning Study

Project Title: Parallel Force Main to WWTP

Project Identifier: 2.1

Location: Meeting point of Big Smoky and Poison Creek Force Mains on Dawn Dr. to WWTP

Need for Project:
- Convey flows from Big Smoky and Poison Creek force mains to WWTP

Objective:
- Install new line to provide increased flow to WWTP

Design Considerations:
- Routing and separation requirements with other utilities
- Assumed cleanout every half mile

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
16-inch Pressure Pipe - Excavation, Backfill	4,100	LF	$ 253	$ 1,037,600	
Connect to existing manhole (discharge manhole)	2	EA	$ 5,746	$ 11,500	
Cleanout (>12")	2	EA	$ 22,984	$ 46,000	
				Construction Subtotal	***$ 1,095,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 109,500	
Bonding			2.5%	$ 27,400	
Contractor Overhead and Profit			15%	$ 164,300	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 328,500	
				Total Construction Subtotal	***$ 1,725,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 259,000	
Engineering - Construction Contract Administration			5%	$ 86,300	
Engineering - Inspection			5%	$ 86,300	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 20,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			3%	$ 51,800	
				Total Project Costs (rounded)	**$ 2,244,000**

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WWTP Facility Planning Study

Project Title: Upstream WW Lake Crossing Lift Station Gravity Line Improvement

Project Identifier: 2.2

Location: Hereford Rd.

Need for Project:
- The existing trunkline does not have adequate capacity to convey flows

Objective:
- Increase the capacity of the existing line

Design Considerations:
- Routing and separation requirements with other utilities
- Full lane replacement is assumed
- Construction assumed to take 30 days

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
15-inch Pipe - Excavation, Backfill	1,000	LF	$ 245	$ 245,400	
Manholes (60")	6	EA	$ 16,089	$ 96,600	
Full Lane Pavement Repair	1,000	LF	$ 101	$ 101,000	
Traffic Control - With Flagging	1,000	LF	$ 9	$ 9,200	
Bypass Pumping	30	/DAY	$ 800	$ 24,000	
				Construction Subtotal	***$ 476,200***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 47,600	
Bonding			2.5%	$ 11,900	
Contractor Overhead and Profit			15%	$ 71,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 142,900	
				Total Construction Subtotal	***$ 750,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 113,000	
Engineering - Construction Contract Administration			5%	$ 37,500	
Engineering - Inspection			5%	$ 37,500	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 20,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			3%	$ 22,500	
				Total Project Costs (rounded)	**$ 996,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Upstream Day/Wagon Lift Station Gravity Line Improvement Project Identifier: 2.3	**Location: Hereford Rd.**

Need for Project:
- The existing trunkline does not have adequate capacity to convey flows

Objective:
- Increase the capacity of the existing line

Design Considerations:
- Routing and separation requirements with other utilities
- Full lane replacement is assumed
- Construction assumed to take 60 days

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
15-inch Pipe - Excavation, Backfill	6,200	LF	$ 245	$ 1,521,300	
Manholes (60")	23	EA	$ 16,089	$ 370,100	
Full Lane Pavement Repair	6,200	LF	$ 101	$ 626,200	
Traffic Control - With Flagging	6,200	LF	$ 9	$ 57,000	
Bypass Pumping	60	/DAY	$ 800	$ 48,000	
				Construction Subtotal	***$ 2,622,600***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 262,300	
Bonding			2.5%	$ 65,600	
Contractor Overhead and Profit			15%	$ 393,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 786,800	
				Total Construction Subtotal	***$ 4,131,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 620,000	
Engineering - Construction Contract Administration			5%	$ 206,600	
Engineering - Inspection			5%	$ 206,600	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 20,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			3%	$ 124,000	
				Total Project Costs (rounded)	**$ 5,324,000**

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WWTP Facility Planning Study

KELLER ASSOCIATES

Project Title: Pump Station Air Release Valve Improvements Project Identifier: 2.4	**Location:**
<u>Need for Project:</u> - Lack of air release valves on discharge lines <u>Objective:</u> - Improve pressure in pipes, prevents air-locking <u>Design Considerations:</u> - Poison Creek and Grasmick have air release - Grasmick air release currently drains into vault and needs to be relocated and replaced	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Air Release Installation (discharge line)	28	EA	$2,500	$ 70,000	
				Construction Subtotal	***$ 70,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 7,000	
Bonding			2.5%	$ 2,000	
Contractor Overhead and Profit			15%	$ 11,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 21,000	
				Total Construction Subtotal	***$ 111,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 17,000	
Engineering - Construction Contract Administration			5%	$ 6,000	
Engineering - Inspection			5%	$ 6,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 3,000	
				Total Project Costs (rounded)	**$ 150,000**

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NLRSWD

WWTP Facility Planning Study

Project Title: Pump Station Flow Monitoring Improvements

Project Identifier: 2.5

Location:

Need for Project:
- Lack of flow meters at 27 out of 29 pump stations

Objective:
- Improve operations and monitor flow in more detail

Design Considerations:
- Assumes new vault, isolation valves, and electrical/controls.

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Flow Meter Installation (includes new vault and isolation valves)	27	EA	$25,000	$ 675,000	
				Construction Subtotal	***$ 675,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 68,000	
Bonding			2.5%	$ 17,000	
Contractor Overhead and Profit			15%	$ 101,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 203,000	
				Total Construction Subtotal	***$ 1,064,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 160,000	
Engineering - Construction Contract Administration			5%	$ 53,000	
Engineering - Inspection			5%	$ 53,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 30,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 32,000	
				Total Project Costs (rounded)	**$ 1,400,000**

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NLRSWD

WWTP Facility Planning Study

Project Title: Pump Station Gauge Improvements Project Identifier: 2.6	**Location:**
Need for Project: - Lack of pressure gauges at all sites Objective: - Improve operations and monitor pump performance Design Considerations: - Assumes 2 installed and working pumps at each lift station: - 29 x 2 =58 discharge pressure gauges needed - 29 x 2 = 58 suction pressure gauges needed	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Suction Pressure Gauge Installation	58	EA	$750	$ 43,500	
Discharge Pressure Gauge Installation	58	EA	$750	$ 43,500	
				Construction Subtotal	***$ 87,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 9,000	
Bonding			2.5%	$ 2,000	
Contractor Overhead and Profit			15%	$ 13,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 26,000	
				Total Construction Subtotal	***$ 137,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 21,000	
Engineering - Construction Contract Administration			5%	$ 7,000	
Engineering - Inspection			5%	$ 7,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 4,000	
				Total Project Costs (rounded)	**$ 180,000**

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NLRSWD

WWTP Facility Planning Study

Project Title: Pump Station Backup Power Improvements (Transfer Switches Only)

Project Identifier: 2.7

Location:

Need for Project:
- Lack of backup power at pump stations

Objective:
- Allow pump stations to remain operational during power outages

Design Considerations:
- 11 pump stations currently do not have a portable generator connection
- Ponderosa has a transfer switch but no portable generator connection

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Portable Generator Connection Installation	11	EA	$5,000	$ 55,000	
Manual Transfer Switch Installation	10	EA	$25,000	$ 250,000	
				Construction Subtotal	***$ 305,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 31,000	
Bonding			2.5%	$ 8,000	
Contractor Overhead and Profit			15%	$ 46,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 92,000	
				Total Construction Subtotal	***$ 482,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 72,000	
Engineering - Construction Contract Administration			5%	$ 24,000	
Engineering - Inspection			5%	$ 24,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 14,000	
				Total Project Costs (rounded)	**$ 620,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: 20-Yr WW Lake X-ing Pump Station Upgrades Project Identifier: 2.8	**Location: Hereford Rd. & Longhorn Way**

Need for Project:
- WW Lake X-ing to be upgraded to a regional lift station

Objective:
- Increase pump firm capacity to handle future peak flows

Design Considerations:
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Second phase of upgrades to get to 20-yr peak inflow pump capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Large Lift Station (>=25 hp pumps)	1	LS	$861,891	$ 861,900	
				Construction Subtotal	***$ 861,900***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 86,200	
Bonding			2.5%	$ 21,500	
Contractor Overhead and Profit			15%	$ 129,300	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 259,000	
				Total Construction Subtotal	***$ 1,358,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 204,000	
Engineering - Construction Contract Administration			5%	$ 67,900	
Engineering - Inspection			5%	$ 67,900	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 40,700	
				Total Project Costs (rounded)	**$ 1,750,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: 20-Yr Ponderosa Pump Station Upgrades Project Identifier: 2.9	**Location: Ponderosa Dr.**

Need for Project:
- Firm capacity of pumps is exceeded for 20-yr peak inflow

Objective:
- Install pumps able to handle 20-yr peak inflow

Design Considerations:
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 420 gpm Pumps	2	EA	$20,000	$ 40,000	
Mechanical Piping Upgrades (Includes Valves)	1	LS	$40,000	$ 40,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
				Construction Subtotal	***$ 105,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 10,500	
Bonding			2.5%	$ 2,600	
Contractor Overhead and Profit			15%	$ 15,800	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 32,000	
				Total Construction Subtotal	***$ 166,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 25,000	
Engineering - Construction Contract Administration			5%	$ 8,300	
Engineering - Inspection			5%	$ 8,300	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 5,000	
				Total Project Costs (rounded)	**$ 220,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: 20-Yr Big Smoky Pump Station Upgrades Project Identifier: 2.10	**Location: Patty Dr.**
Need for Project: - Big Smoky to be upgraded to a regional lift station Objective: - Install pumps able to handle 20-yr peak inflow Design Considerations: - New pump capacity calculated to be 20-yr peak inflow + 15%	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Large Lift Station (>=25 hp pumps)	1	LS	$861,891	$ 861,900	
				Construction Subtotal	***$ 861,900***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 86,200	
Bonding			2.5%	$ 21,500	
Contractor Overhead and Profit			15%	$ 129,300	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 259,000	
				Total Construction Subtotal	***$ 1,358,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 204,000	
Engineering - Construction Contract Administration			5%	$ 67,900	
Engineering - Inspection			5%	$ 67,900	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 40,700	
				Total Project Costs (rounded)	**$ 1,750,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: 20-Yr Rex/Morning Pump Station Upgrades

Project Identifier: 2.11

Location: Morning Dr.

Need for Project:
- Firm capacity of pumps is exceeded for 20-yr peak inflow

Objective:
- Install pumps able to handle 20-yr peak inflow

Design Considerations:
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 105 gpm Pumps	2	EA	$12,000	$ 24,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
				Construction Subtotal	***$ 49,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 4,900	
Bonding			2.5%	$ 1,200	
Contractor Overhead and Profit			15%	$ 7,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 15,000	
				Total Construction Subtotal	***$ 78,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 12,000	
Engineering - Construction Contract Administration			5%	$ 3,900	
Engineering - Inspection			5%	$ 3,900	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 2,300	
				Total Project Costs (rounded)	**$ 110,000**

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

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NLRSWD
WWTP Facility Planning Study

Project Title: 20-Yr Jack's Loop Pump Station Upgrades Project Identifier: 2.12	**Location: Jack's Loop**
Need for Project: - Firm capacity of pumps is exceeded for 20-yr peak inflow Objective: - Install pumps able to handle 20-yr peak inflow Design Considerations: - New pump capacity calculated to be 20-yr peak inflow + 15% - Assumed existing transformer has adequate capacity	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 105 gpm Pumps	2	EA	$12,000	$ 24,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
				Construction Subtotal	***$ 49,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 4,900	
Bonding			2.5%	$ 1,200	
Contractor Overhead and Profit			15%	$ 7,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 14,700	
				Total Construction Subtotal	***$ 78,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 12,000	
Engineering - Construction Contract Administration			5%	$ 3,900	
Engineering - Inspection			5%	$ 3,900	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 2,300	
				Total Project Costs (rounded)	**$ 110,000**

EA = each, LF = linear foot, LS = lump sum
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NLRSWD
WWTP Facility Planning Study

Project Title: 20-Yr Hawks Bay Pump Station Upgrades

Project Identifier: 2.13

Location: Hawks Bay Rd. & Tamarack Falls Rd.

Need for Project:
- Firm capacity of pumps is exceeded for 20-yr peak inflow

Objective:
- Install pumps able to handle 20-yr peak inflow

Design Considerations:
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 280 gpm Pumps	2	EA	$15,000	$ 30,000	
Generator Upgrade	1	EA	$45,000	$ 45,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
				Construction Subtotal	***$ 100,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 10,000	
Bonding			2.5%	$ 2,500	
Contractor Overhead and Profit			15%	$ 15,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 30,000	
				Total Construction Subtotal	***$ 158,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 24,000	
Engineering - Construction Contract Administration			5%	$ 7,900	
Engineering - Inspection			5%	$ 7,900	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 4,700	
				Total Project Costs (rounded)	**$ 208,000**

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

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WWTP Facility Planning Study

Project Title: 20-Yr Poison Creek Pump Station Upgrades Project Identifier: 2.14	**Location: W Mountain Rd.**

Need for Project:
- Firm capacity of pumps is exceeded for 20-yr peak inflow

Objective:
- Install pumps able to handle 20-yr peak inflow

Design Considerations:
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumes system will remain a triplex and two pumps can be used to meet firm capacity
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 1,500 gpm Pumps	3	EA	$70,000	$ 210,000	
Generator Upgrade	1	EA	$45,000	$ 45,000	
Regional LS Piping Upgrades (Includes Valves)	1	LS	$150,000	$ 150,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
				Construction Subtotal	***$ 430,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 43,000	
Bonding			2.5%	$ 10,800	
Contractor Overhead and Profit			15%	$ 64,500	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 129,000	
				Total Construction Subtotal	***$ 678,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 102,000	
Engineering - Construction Contract Administration			5%	$ 33,900	
Engineering - Inspection			5%	$ 33,900	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 25,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 20,300	
				Total Project Costs (rounded)	**$ 894,000**

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

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WWTP Facility Planning Study

KELLER ASSOCIATES

Project Title: 20-Yr Smiling Julie Pump Station Upgrades

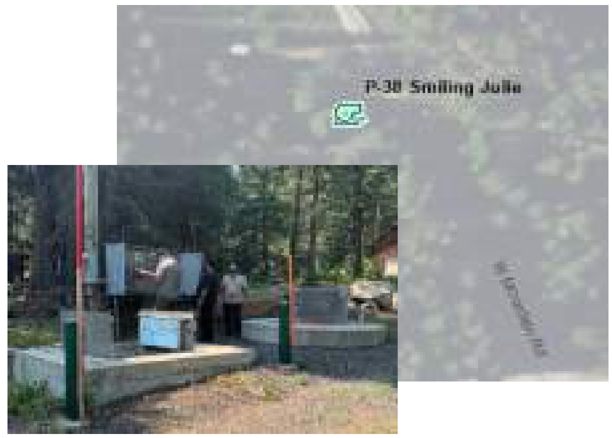
Project Identifier: 2.15

Location: W Mountain Rd.

Need for Project:
- Firm capacity of pumps is exceeded for 20-yr peak inflow

Objective:
- Install pumps able to handle 20-yr peak inflow

Design Considerations:
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumed existing transformer has adequate capacity



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 165 gpm Pumps	2	EA	$12,000	$ 24,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
				Construction Subtotal	***$ 49,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 4,900	
Bonding			2.5%	$ 1,200	
Contractor Overhead and Profit			15%	$ 7,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 14,700	
				Total Construction Subtotal	***$ 78,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 12,000	
Engineering - Construction Contract Administration			5%	$ 3,900	
Engineering - Inspection			5%	$ 3,900	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 2,300	
				Total Project Costs (rounded)	**$ 110,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Fir Grove Pump Station Upgrades Project Identifier: 2.16	**Location: Durham Ln.**

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time. Firm capacity of pumps is exceeded for 20-yr peak inflow

Objective:
- Improve operations at pump station and install pumps able to handle 20-yr peak inflow

Design Considerations:
- New pump capacity calculated to be 20-yr peak inflow + 15%
- Assumed existing transformer has adequate capacity

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 350 gpm Pumps	2	EA	$20,000	$ 40,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
Replace Level Read-Out	1	EA	$3,000	$ 3,000	
Grout Penetrations	1	LS	$1,000	$ 1,000	
				Construction Subtotal	***$ 69,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 6,900	
Bonding			2.5%	$ 1,700	
Contractor Overhead and Profit			15%	$ 10,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 20,700	
				Total Construction Subtotal	***$ 108,700***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 16,000	
Engineering - Construction Contract Administration			5%	$ 5,400	
Engineering - Inspection			5%	$ 5,400	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 3,300	
				Total Project Costs (rounded)	**$ 144,000**

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NLRSWD

WWTP Facility Planning Study

Project Title: Day Star Lake X-ing Pump Station Upgrades Project Identifier: 2.17	**Location: E Shadows Trail & Railroad ROW**
Need for Project: - Firm capacity of pumps is exceeded for 20-yr peak inflow Objective: - Improve operations at pump station and install pumps able to handle 20-yr peak inflow Design Considerations: - New pump capacity calculated to be 20-yr peak inflow + 15% - Assumed existing transformer has adequate capacity	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Existing Pumps with 225 gpm Pumps	2	EA	$15,000	$ 30,000	
Electrical Upgrades	1	EA	$25,000	$ 25,000	
Repair Level Sensor Delayed Signal	1	EA	$2,500	$ 2,500	
				Construction Subtotal	***$ 57,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 5,800	
Bonding			2.5%	$ 1,400	
Contractor Overhead and Profit			15%	$ 8,600	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 17,300	
				Total Construction Subtotal	***$ 91,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 14,000	
Engineering - Construction Contract Administration			5%	$ 4,600	
Engineering - Inspection			5%	$ 4,600	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 2,700	
				Total Project Costs (rounded)	**$ 122,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Arrowhead Pump Station Upgrades

Project Identifier: 2.18

Location: Lee Way & Homer Ln.

Need for Project:
- Install necessary pump station items to improve safety at site

Objective:
- Improve operations at pump station and safety precautions

Design Considerations:
-

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Install Camlock Cap	1	EA	$1,000	$ 1,000	
Install Load Rated Vault Hatch	1	EA	$4,000	$ 4,000	
				Construction Subtotal	***$ 5,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 500	
Bonding			2.5%	$ 100	
Contractor Overhead and Profit			15%	$ 800	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 2,000	
				Total Construction Subtotal	***$ 9,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 1,000	
Engineering - Construction Contract Administration			5%	$ 500	
Engineering - Inspection			5%	$ 500	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 5,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 300	
				Total Project Costs (rounded)	**$ 20,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: Hillhouse Pump Station Upgrades Project Identifier: 2.19	**Location: Hillhouse Loop**
<u>Need for Project:</u> - Install necessary pump station items and complete needed upgrades that come with wear over time <u>Objective:</u> - Improve operations at pump station <u>Design Considerations:</u> - Assumes all interior pipe/supports are corroded needing replacement - Assumes 20 SF of concrete rehabilitation - Room for 3 pumps	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Pipe and Support Replacement	1	LS	$18,000	$ 18,000	
Concrete Rehabilitation	20	SF	$250	$ 5,000	
				Construction Subtotal	***$ 23,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 2,300	
Bonding			2.5%	$ 600	
Contractor Overhead and Profit			15%	$ 3,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 7,000	
				Total Construction Subtotal	***$ 36,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 5,000	
Engineering - Construction Contract Administration			5%	$ 1,800	
Engineering - Inspection			5%	$ 2,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 1,100	
				Total Project Costs (rounded)	**$ 46,000**

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

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NLRSWD

WWTP Facility Planning Study

Project Title: RR Village Pump Station Upgrades Project Identifier: 2.20	Location: Spring Valley Rd.
Need for Project: - Install necessary pump station items and complete needed upgrades that come with wear over time Objective: - Improve operations at pump station Design Considerations: -	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Replace Wooden Pipe Support	1	EA	$5,000	$ 5,000	
Grout Holes	1	LS	$1,000	$ 1,000	
				Construction Subtotal	***$ 6,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 600	
Bonding			2.5%	$ 200	
Contractor Overhead and Profit			15%	$ 900	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 1,800	
				Total Construction Subtotal	***$ 9,500***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 1,000	
Engineering - Construction Contract Administration			5%	$ 500	
Engineering - Inspection			5%	$ 500	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 300	
				Total Project Costs (rounded)	**$ 11,800**

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WWTP Facility Planning Study

Project Title: Lake Forest Pump Station Upgrades Project Identifier: 2.21	**Location: Forest Lake Circle**
Need for Project: - Install necessary pump station items and complete needed upgrades that come with wear over time Objective: - Improve operations and monitor flow in more detail Design Considerations: - Assumes pump 1 was replaced during July/August 2021	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Properly Mount Level Sensor	1	EA	$1,200	$ 1,200	
				Construction Subtotal	***$ 1,200***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 100	
Bonding			2.5%	$ -	
Contractor Overhead and Profit			15%	$ 200	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 400	
				Total Construction Subtotal	***$ 2,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ -	
Engineering - Construction Contract Administration			5%	$ 100	
Engineering - Inspection			5%	$ 100	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 100	
				Total Project Costs (rounded)	**$ 3,000**

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

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

NLRSWD

WWTP Facility Planning Study

Project Title: Meadows (West Mtn) Pump Station Upgrades

Project Identifier: 2.22

Location: Norwood Rd.

Need for Project:
- Install necessary pump station items and complete needed upgrades that come with wear over time

Objective:
- Improve operations at pump station

Design Considerations:
- Documented as not being NLRSWD owned
- 3 pumps (1 jockey)

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Installation of Mixer Rails	3	EA	$2,000	$ 6,000	
Controller Wire Protection	10	LF	$50	$ 500	
				Construction Subtotal	***$ 6,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 700	
Bonding			2.5%	$ 200	
Contractor Overhead and Profit			15%	$ 1,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 2,000	
				Total Construction Subtotal	***$ 11,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 2,000	
Engineering - Construction Contract Administration			5%	$ 600	
Engineering - Inspection			5%	$ 600	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			3%	$ 400	
				Total Project Costs (rounded)	**$ 15,000**

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

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APPENDIX E

Treatment CIP Summary Sheets

Project ID#	Project Name	Primary Purpose	Total Estimated Cost (2023 Dollars)
Priority 1 Improvements			
1.1	Lagoon Sludge Removal and Diffuser Replacement	Operations, Capacity	$1,280,000
1.2	Dewatering System	Operations, Capacity	$1,902,000
1.3	Headworks (Grit Removal, HVAC Upgrade)	Operations	$1,190,000
1.4	RI Basin Maintenance	Operations, Capacity	$978,000
1.5	Phosphorus Removal	Permit Compliance	$104,000
1.6	Miscellaneous Items including Spare Parts	Operations, Capacity, Redundancy	$455,000
1.7	SCADA and PLC Upgrades	Operations	$474,000
1.8	Convert Disinfection from Gas to Liquid Chlorine	Safety, Capacity	$707,000
		Total WWTP Priority 1 Improvements (rounded)	***$7,090,000***
Priority 2 Improvements			
2.1	Blower Upgrade	Power Savings, Capacity	$2,879,000
2.2	Belt Dryer	Operations	$5,058,000
2.3	Additional Membranes and Permeate Pumps	Operations, Capacity	$572,000
		Total WWTP Priority 2 Improvements (rounded)	***$8,509,000***
		TOTAL TREATMENT PLANT IMPROVEMENT COSTS (rounded)	**$15,599,000**

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NLRSWD
WWTP Facility Planning Study

KELLER ASSOCIATES

Project Title: Lagoon Sludge Removal and Diffuser Replacement

Project Identifier: 1.1

Project Location: Lagoons 1 and 2

<u>Need for Project:</u>
- Lagoon 1 is nearing capacity and diffuser equipment is nearing its end of useful life

<u>Objective:</u>
-Remove sludge in lagoons and replace diffusers in Lagoons 1 and 2.

<u>Design Considerations:</u>
- Assumes all diffusers in Lagoons 1 and 2 need replacement

Item		Cost (2023)
Sludge Removal	$	600,000
Lagoon Diffuser Replacement	$	154,000
Subtotal	***$***	***754,000***
General Conditions (10%)	$	15,000
Subtotal	***$***	***769,000***
Contingency (30%)	$	231,000
Subtotal	***$***	***1,000,000***
Contractor OH&P (15%)	$	24,000
Total Construction Cost	**$**	**1,024,000**
Engineering Design and Construction Services	$	256,000
Total Project Cost	**$**	**1,280,000**

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NLRSWD
WWTP Facility Planning Study

Project Title: Dewatering System

Project Identifier: 1.2

Project Location: Near MBR Building

Need for Project:
- The WWTP does not have a dewatering system.

Objective:
-Install sludge dewatering to avoid lagoon sludge removal and move towards Class A biosolids. Provide WAS pumps to convey the appropriate flow to screw presses

Design Considerations:
- New building assumes room for future expansion

Item	Cost (2023)	
Site Work	$	110,000
Screw Press	$	304,000
Building	$	300,000
New WAS Pumps	$	60,000
Pipes and Appurtenances	$	60,000
Electrical and Controls	$	90,000
Subtotal	***$***	***924,000***
General Conditions (10%)	$	93,000
Subtotal	***$***	***1,017,000***
Contingency (30%)	$	305,000
Subtotal	***$***	***1,322,000***
Contractor OH&P (15%)	$	199,000
Total Construction Cost	**$**	**1,521,000**
Engineering Design and Construction Services	$	381,000
Total Project Cost	**$**	**1,902,000**

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NLRSWD
WWTP Facility Planning Study

Project Title: Headworks (Grit Removal, HVAC Upgrade)

Project Location: Headworks Building

Project Identifier: 1.3

Need for Project:
- The headworks building shows signs of corrosion, and the WWTP lacks grit removal

Objective:
-Install grit removal to protect downstream processes. Upgrade HVAC system to avoid corrosion.

Design Considerations:
- Use of extra screen channel for grit removal

Item	Cost (2023)	
Grit Removal	$	350,000
Headworks Building Upgrades	$	175,000
Electrical and Controls	$	53,000
Subtotal	***$***	***578,000***
General Conditions (10%)	$	58,000
Subtotal	***$***	***636,000***
Contingency (30%)	$	191,000
Subtotal	***$***	***827,000***
Contractor OH&P (15%)	$	125,000
Total Construction Cost	**$**	**952,000**
Engineering Design and Construction Services	$	238,000
Total Project Cost	**$**	**1,190,000**

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NLRSWD
WWTP Facility Planning Study

KELLER ASSOCIATES

Project Title: RIB Maintenance	**Project Location: RIBs and MBR Building**
Project Identifier: 1.4	

Need for Project:
- The RIBs are overgrown due to lack of use. The UV system has not been used and requires inspection.

Objective:
-Perform maintenance on RI Basins and UV system to prepare for more frequent use.

Item	Cost (2023)
RIB Maintenance	$ 200,000
UV System Refurbishment	$ 200,000
Irrigation Pump	$ 50,000
Electrical and Controls	$ 25,000
Subtotal	***$ 475,000***
General Conditions (10%)	$ 48,000
Subtotal	***$ 523,000***
Contingency (30%)	$ 157,000
Subtotal	***$ 680,000***
Contractor OH&P (15%)	$ 102,000
Total Construction Cost	**$ 782,000**
Engineering Design and Construction Services	$ 196,000
Total Project Cost	**$ 978,000**

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NLRSWD
WWTP Facility Planning Study

Project Title: Phosphorus Removal

Project Identifier: 1.5

Project Location: MBR Chemical Room

<u>Need for Project:</u>
- Discharge to RIBs require sticter phosphorus limits

<u>Objective:</u>
-Install updated chemical dosing system for phosphorus removal.

<u>Design Considerations:</u>
- Reuse space and piping for existing alum system

Item	Cost (2023)	
Dosing System and Piping	$	50,000
Subtotal	***$***	***50,000***
General Conditions (10%)	$	5,000
Subtotal	***$***	***55,000***
Contingency (30%)	$	17,000
Subtotal	***$***	***72,000***
Contractor OH&P (15%)	$	11,000
Total Construction Cost	**$**	**83,000**
Engineering Design and Construction Services	$	21,000
Total Project Cost	**$**	**104,000**

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NLRSWD
WWTP Facility Planning Study

KELLER ASSOCIATES

Project Title: Miscellaneous Items including Spare Parts

Project Identifier: 1.6

Project Location: Entire WWTP

Need for Project:
- A spare parts inventory is not mainted by the WWTP

Objective:
-Maintain and update an inventory of equipment and spare parts to be readily used in the event of failures.

Item	Cost (2023)
ORP Probe	$ 15,000
Piping Resonance	$ 50,000
Replace Missing RAS Pump	$ 30,000
Spare Permeate Pump	$ 40,000
Replace Missing Mixer	$ 15,000
Effluent Irrigation Pumps	$ 150,000
Instrumentation Parts	$ 50,000
Subtotal	***$ 350,000***
General Conditions (10%)	$ -
Subtotal	***$ 350,000***
Contingency (30%)	$ 105,000
Subtotal	***$ 455,000***
Contractor OH&P (15%)	$ -
Total Construction Cost	**$ 455,000**
Engineering Design and Construction Services	$ -

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NLRSWD
WWTP Facility Planning Study

Project Title: SCADA and PLC Upgrades

Project Identifier: 1.7

Project Location: MBR Building

Need for Project:
- SCADA and PLC systems are outdated.

Objective:
-Upgrade the existing SCADA and PLC. The current SCADA system is out of date and lacks good monitoring capabilities.

Design Considerations:
- SCADA implementation for existing and new processes

Item	Cost (2023)	
SCADA	$	60,000
PLC	$	120,000
Integration	$	50,000
Subtotal	***$***	***230,000***
General Conditions (10%)	$	23,000
Subtotal	***$***	***253,000***
Contingency (30%)	$	76,000
Subtotal	***$***	***329,000***
Contractor OH&P (15%)	$	50,000
Total Construction Cost	**$**	**379,000**
Engineering Design and Construction Services	$	95,000
Total Project Cost	**$**	**474,000**

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NLRSWD
WWTP Facility Planning Study

Project Title: Convert Disinfection from Gas to Liquid Chlorine

Project Location: MBR Building

Project Identifier: 1.8

Need for Project:
- Chlorine gas is dangerous for operations staff

Objective:
- Transition from gas chlorine for disinfection to liquid chlorine to improve operator safety.

Design Considerations:
- Existing space will be reused

Item	Cost (2023)	
Liquid Chlorine System	$	134,000
New Pipeline	$	110,000
Transfer Structure	$	85,000
Electrical and Controls	$	15,000
Subtotal	***$***	***344,000***
General Conditions (10%)	$	34,000
Subtotal	***$***	***378,000***
Contingency (30%)	$	113,000
Subtotal	***$***	***491,000***
Contractor OH&P (15%)	$	74,000
Total Construction Cost	**$**	**565,000**
Engineering Design and Construction Services	$	142,000
Total Project Cost	**$**	**707,000**

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NLRSWD
WWTP Facility Planning Study

Project Title: Blower Upgrade	**Project Location: Blower Room in the MBR Building**
Project Identifier: 2.1	

Need for Project:
- Future loadings will require additional blower capacity

Objective:
-Replace the existing process and MBR blowers

Item	Cost (2023)
MBR Blowers	$ 600,000
Process Blowers	$ 800,000
Subtotal	***$ 1,400,000***
General Conditions (10%)	$ 140,000
Subtotal	***$ 1,540,000***
Contingency (30%)	$ 462,000
Subtotal	***$ 2,002,000***
Contractor OH&P (15%)	$ 301,000
Total Construction Cost	**$ 2,303,000**
Engineering Design and Construction Services	$ 576,000
Total Project Cost	**$ 2,879,000**

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NLRSWD
WWTP Facility Planning Study

Project Title: Belt Dryer

Project Identifier: 2.2

Project Location: Near the MBR Building

Need for Project:
- Reduce disposal costs for dewatered biosolids

Objective:
-Install a belt dryer to achieve Class A Biosolids

Design Considerations:
- Building space will include space for future expansion

Item	Cost (2023)	
Site Work	$	150,000
Belt Dryer	$	1,150,000
Building	$	800,000
Pipe and Appurtenances	$	60,000
Electrical and Controls	$	300,000
Subtotal	***$***	***2,460,000***
General Conditions (10%)	$	246,000
Subtotal	***$***	***2,706,000***
Contingency (30%)	$	812,000
Subtotal	***$***	***3,518,000***
Contractor OH&P (15%)	$	528,000
Total Construction Cost	**$**	**4,046,000**
Engineering Design and Construction Services	$	1,012,000
Total Project Cost	**$**	**5,058,000**

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NLRSWD
WWTP Facility Planning Study

KELLER ASSOCIATES

Project Title: Additional Membranes and Permeate Pumps

Project Identifier: 2.3

Project Location: MBR Building

Need for Project:
- Prepare for future increases in flow

Objective:
-Install additional membranes and permeate pumps to expand hydraulic capacity.

Item	Cost (2023)	
Membrane Replacement	$	165,000
Permeate Pumps	$	72,000
Spare Permeate Pump	$	40,000
Subtotal	***$***	***277,000***
General Conditions (10%)	$	28,000
Subtotal	***$***	***305,000***
Contingency (30%)	$	92,000
Subtotal	***$***	***397,000***
Contractor OH&P (15%)	$	60,000
Total Construction Cost	**$**	**457,000**
Engineering Design and Construction Services	$	115,000
Total Project Cost	**$**	**572,000**

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APPENDIX F

Environmental

DocuSign Envelope ID: 32860EDE-7C29-4648-B4E2-644DF91C5DB6

National Flood Hazard Layer FIRMette

FEMA

116°5'4"W 44°43'45"N

116°4'26"W 44°43'19"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/3/2022 at 5:50 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

116°5'4"W 44°43'40"N

116°4'26"W 44°43'15"N

Feet 0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

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- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
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- Effective LOMRs
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- Coastal Transect Baseline
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- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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Listed species believed to or known to occur in Valley, Idaho

This report includes species only if they have a **Spatial Current Range** in ECOS.

The following report contains species that are known to or are believed to occur in this county, based on the species current range, as defined by the USFWS. The definition of current range that the FWS uses is the general geographic area where we know or suspect that a species currently occurs.

This list of species by county cannot be used for consultation purposes. To obtain an official list of species that should be considered during consultation, please visit IPaC.

CSV

Show All entries Search:

14 Species Listings

Group	Name	Population	Status	Lead Region	
Insects	Monarch butterfly (Danaus plexippus)	Wherever found	Candidate	3	Assistant Regional Director-Ecological Services
Mammals	Little brown bat (Myotis lucifugus)	Wherever found	Under Review	3	Indiana Ecological Services Field Office

Fishes	Bull Trout (Salvelinus confluentus)	U.S.A., conterminous, (lower 48 states)	Threatened	1	Idaho Fish and Wildlife Office	Coa Rec Imp Plar Trou (Salv con
Fishes	Bull Trout (Salvelinus confluentus)	U.S.A., conterminous, (lower 48 states)	Threatened	1	Idaho Fish and Wildlife Office	Colu Hea Rec Imp Plar Trou (Salv con
Fishes	Bull Trout (Salvelinus confluentus)	U.S.A., conterminous, (lower 48 states)	Threatened	1	Idaho Fish and Wildlife Office	Klar Rec Imp Plar Trou (Salv con
Fishes	Bull Trout (Salvelinus confluentus)	U.S.A., conterminous, (lower 48 states)	Threatened	1	Idaho Fish and Wildlife Office	Mid Rec Imp Plar Trou (Salv con
Fishes	Bull Trout (Salvelinus confluentus)	U.S.A., conterminous, (lower 48 states)	Threatened	1	Idaho Fish and Wildlife Office	Rec for t Cote Unit Pop Bull (Salv con

Fishes	Bull Trout (Salvelinus confluentus)	U.S.A., conterminous, (lower 48 states)	Threatened	1	Idaho Fish and Wildlife Office	St. M Reco Imp Plar Trou (Salv conf
Fishes	Bull Trout (Salvelinus confluentus)	U.S.A., conterminous, (lower 48 states)	Threatened	1	Idaho Fish and Wildlife Office	Upp Reco Imp Plar Trou (Salv conf
Mammals	North American wolverine (Gulo gulo luscus)	Wherever found	Proposed Threatened	6	Montana Ecological Services Field Office	
Mammals	Gray wolf (Canis lupus)	Northern Rocky Mountain Distinct Population Segment: Montana, Idaho, Wyoming, eastern Washington, eastern Oregon, and north central Utah	Under Review	6	Office of the Regional Director	
Conifers and Cycads	Whitebark pine (Pinus albicaulis)	Wherever found	Threatened	6	Wyoming Ecological Services Field Office	REC OUT WHI PINI albi

Mammals	Northern Idaho Ground Squirrel (Urocitellus brunneus)	Wherever found	Threatened	1	Idaho Fish and Wildlife Office	Rec for t Nor Gro Squ
Mammals	Canada Lynx (Lynx canadensis)	Wherever Found in Contiguous U.S.	Threatened	6	Montana Ecological Services Field Office	Rec Out Con Unit Dist Pop Seg Can (Lyn can

Showing 1 to 14 of 14 entries

Previous 1 Next

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Adams and Valley counties, Idaho

Local office

Idaho Fish And Wildlife Office

(208) 378-5243
(208) 378-5262

1387 South Vinnell Way, Suite 368

1387 South Vinnell Way, Suite 308
Boise, ID 83709-1657

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3652	Threatened
North American Wolverine *Gulo gulo luscus* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5123	Proposed Threatened

Fishes

NAME	STATUS
Bull Trout *Salvelinus confluentus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8212	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Conifers and Cycads

NAME	STATUS
Whitebark Pine *Pinus albicaulis* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1748	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
California Gull Larus californicus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
Cassin's Finch Carpodacus cassinii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Aug 31
Evening Grosbeak Coccothraustes vespertinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Franklin's Gull Leucophaeus pipixcan This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Lewis's Woodpecker Melanerpes lewis — Breeds Apr 20 to Sep 30

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9408

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Rufous Hummingbird selasphorus rufus — Breeds Apr 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Western Grebe aechmophorus occidentalis — Breeds Jun 1 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/6743

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

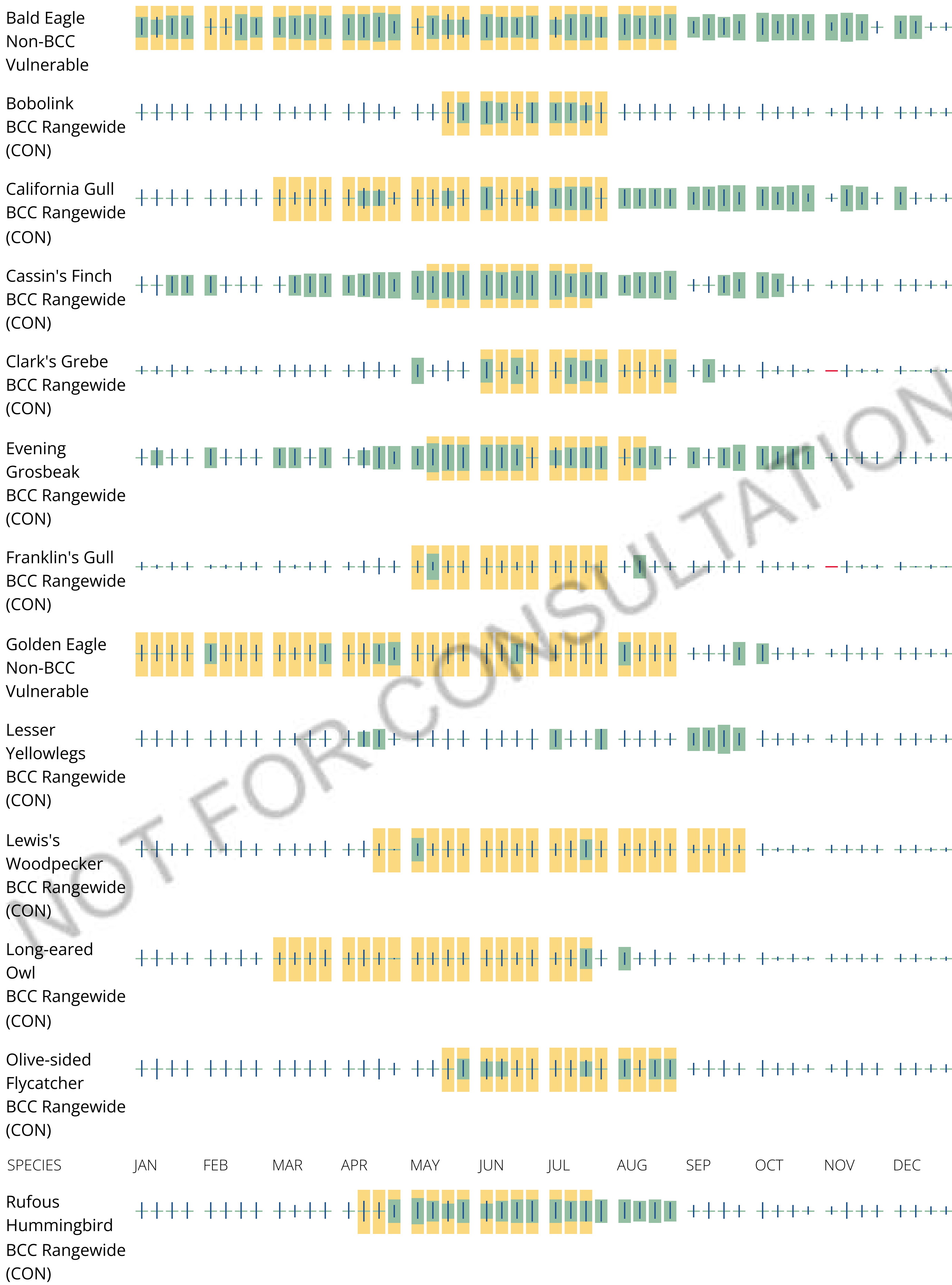
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

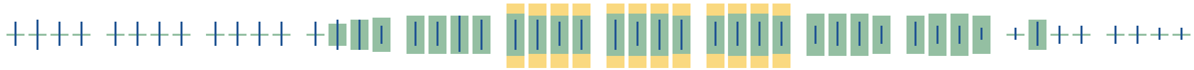
■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC



Bald Eagle
Non-BCC
Vulnerable
Bobolink
BCC Rangewide
(CON)
California Gull
BCC Rangewide
(CON)
Cassin's Finch
BCC Rangewide
(CON)
Clark's Grebe
BCC Rangewide
(CON)
Evening
Grosbeak
BCC Rangewide
(CON)
Franklin's Gull
BCC Rangewide
(CON)
Golden Eagle
Non-BCC
Vulnerable
Lesser
Yellowlegs
BCC Rangewide
(CON)
Lewis's
Woodpecker
BCC Rangewide
(CON)
Long-eared
Owl
BCC Rangewide
(CON)
Olive-sided
Flycatcher
BCC Rangewide
(CON)
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Rufous
Hummingbird
BCC Rangewide
(CON)

Western Grebe
BCC Rangewide
(CON)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

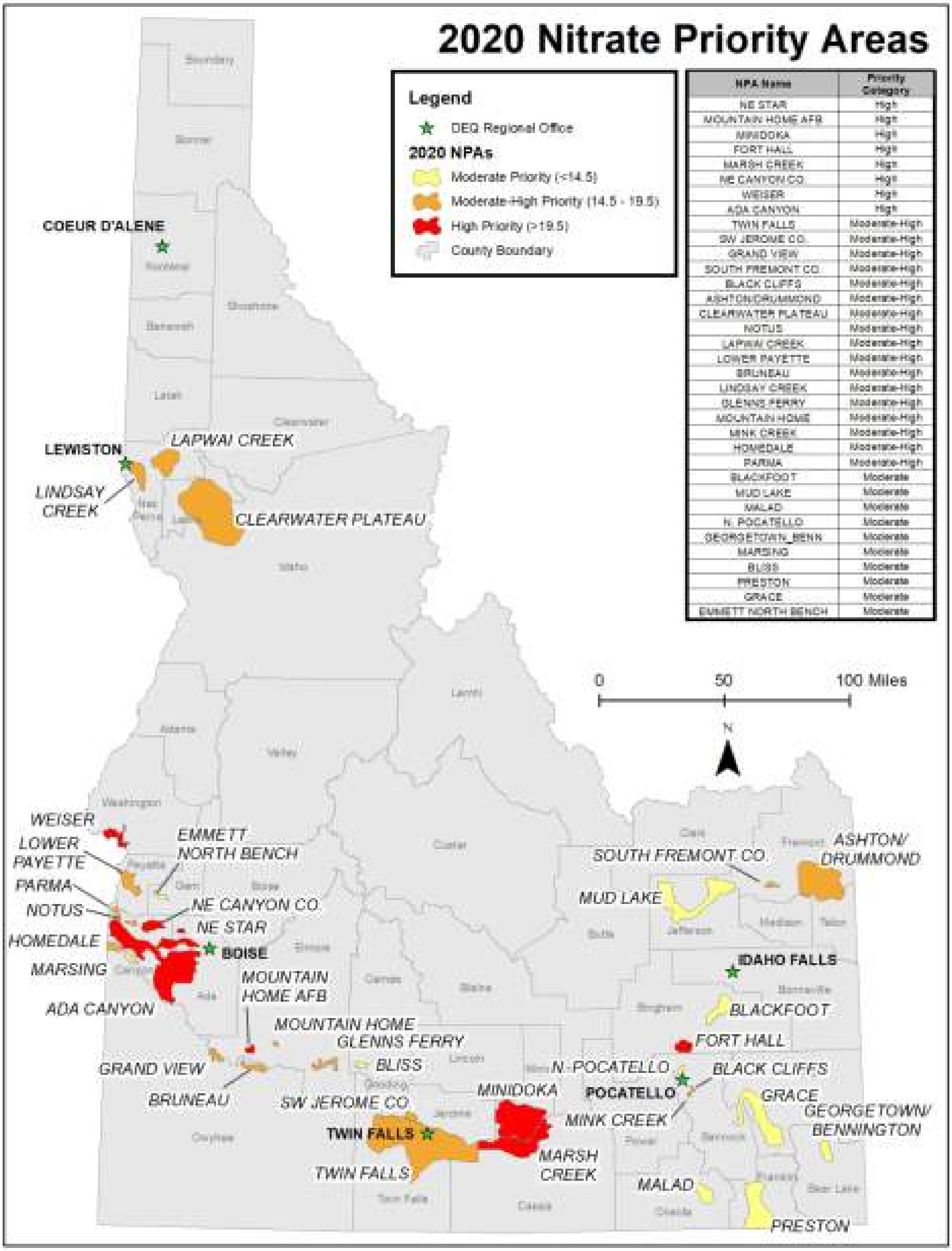


Figure 1. 2020 ranked nitrate priority areas.

2020 NPA Delineations and Ranking Table

August 2021

Name	Region	Acres	Sq. Miles	Population	Number of Sites	Max. Nitrate	Average Nitrate	Median	PWS Wells	PWS SWA	# ≥ 2mg/L	% ≥ 2mg/L	# ≥ 5mg/L	% ≥ 5mg/L	# ≥ 10mg/L	% ≥ 10mg/L	2007-2016 Trend*	2020 Score	Rounded 2020 Score	2020 Rank
NE STAR	BRO	3,180	5	357	47	44	12.2	7.7	2	5	35	74	29	62	22	47	**Increasing Trend**	24.28	24	1
MOUNTAIN HOME AFB	BRO	5,983	9	3,238	33	27.9	9.4	7.8	7	6	31	94	25	76	11	33	**Increasing Trend**	23.98	24	2
MINIDOKA	TFRO	145,083	227	18,605	347	83	5.1	4.3	48	75	227	65	142	41	27	8	**Increasing Trend**	23.15	23	3
FORT HALL	PRO	17,277	27	1,158	17	23.6	11.7	11.0	3	5	16	94	14	82	10	59	Ins. Data/No Trend	21.88	22	4
MARSH CREEK	TFRO	101,345	158	18,084	403	40	6.8	5.8	55	46	354	88	242	60	81	20	No Trend	21.76	22	5
NE CANYON CO. (PURPLE S.)	BRO	18,653	29	4,847	176	27	5.9	5.4	32	27	149	85	94	53	17	10	**Increasing Trend**	21.35	21	6
WEISER	BRO	21,462	34	7,393	150	60	12.0	10.1	26	24	130	87	118	79	75	50	*Decreasing Tendency*	21.19	21	7
ADA CANYON	BRO	251,883	394	205,419	1117	38.4	5.1	4.2	274	339	837	75	462	41	130	12	*No Trend*	19.75	20	8
TWIN FALLS	TFRO	363,687	568	76,293	719	41	4.9	4.7	111	91	621	86	315	44	30	4	No Trend	19.32	19	9
SW JEROME CO.	TFRO	7,901	12	615	30	30	7.4	5.0	0	0	29	97	15	50	5	17	**Increasing Trend**	19.14	19	10
GRAND VIEW	BRO	9,173	14	596	32	110	13.3	8.2	2	2	30	94	26	81	13	41	Ins. Data/No Trend	19.03	19	11
SOUTH FREMONT CO.	IFRO	4,964	8	156	13	38	14.5	7.9	0	4	11	85	9	69	6	46	Ins. Data/No Trend	18.75	19	12
BLACK CLIFFS	PRO	1,030	2	493	28	28.68	10.3	9.8	2	2	19	68	17	61	14	50	Ins. Data/No Trend	18.41	18	13
ASHTON/DRUMMOND	IFRO	145,111	227	2,367	209	38.3	7.3	6.4	12	16	187	89	148	71	35	17	No Trend	18.03	18	14
CLEARWATER PLATEAU	LRO	268,361	419	3,760	138	52	6.4	4.2	18	22	98	71	61	44	31	22	No Trend	17.82	18	15
NOTUS	BRO	4,288	7	211	20	16	7.6	7.3	1	1	17	85	16	80	6	30	Ins. Data/No Trend	17.7	18	16
LAPWAI CREEK	LRO	49,168	77	1,163	37	18.8	7.4	6.6	5	10	28	76	23	62	11	30	Ins. Data/No Trend	17.62	18	17
LOWER PAYETTE	BRO	26,205	41	7,214	207	61	6.3	4.4	23	37	148	71	96	46	38	18	No Trend	17.52	18	18
BRUNEAU	BRO	13,420	21	32	8	92	22.6	13.1	0	0	7	88	6	75	4	50	Ins. Data/No Trend	17.51	18	19
LINDSAY CREEK	LRO	26,246	41	13,212	65	21	5.6	4.3	19	19	42	65	31	48	15	23	No Trend	17.00	17	20
GLENNS FERRY	BRO	13,398	21	1,578	17	73.3	12.1	6.5	3	2	14	82	11	65	5	29	Ins. Data/No Trend	16.79	17	21
MOUNTAIN HOME	BRO	2,014	3	480	53	40	9.6	5.5	3	3	46	87	29	55	17	32	Ins. Data/No Trend	16.69	17	22
MINK CREEK	PRO	1,576	2	643	34	21	5.4	4.0	6	30	23	68	15	44	8	24	Ins. Data/No Trend	15.96	16	23
HOMEDALE	BRO	8,765	14	1,753	40	17.1	5.4	3.4	9	14	22	55	17	43	10	25	Ins. Data/No Trend	15.75	16	24
PARMA	BRO	4,980	8	998	30	16	5.7	5.2	5	6	19	63	16	53	8	27	Ins. Data/No Trend	15.61	16	25
BLACKFOOT	PRO	32,620	51	1,979	22	16	5.5	5.4	3	24	17	77	12	55	3	14	**Dereasing Tendency**	13.19	13	26
MALAD	PRO	22,379	35	2,803	16	11.51	3.3	2.6	4	4	8	50	4	25	2	13	Ins. Data/No Trend	12.55	13	27
MUD LAKE	IFRO	111,709	175	1,682	97	26	4.3	4.2	18	14	73	75	30	31	5	5	No Trend	12.55	13	28
N. POCATELLO	PRO	5,511	9	23,062	25	8.9	4.4	4.0	26	40	22	88	7	28	2	8	*Decreasing Tendency*	12.46	12	29
GEORGETOWN_BENN	PRO	17,764	28	795	22	13.3	4.2	2.8	2	2	14	64	10	45	2	9	Ins. Data/No Trend	12.43	12	30
MARSING	BRO	5,994	9	393	35	56	12.3	6.6	3	3	24	69	21	60	14	40	**Decreasing Trend**	12.38	12	31
BLISS	TFRO	6,218	10	66	24	19	4.6	2.9	0	0	14	58	9	38	4	17	Ins. Data/No Trend	11.76	12	32
PRESTON	PRO	94,761	148	9,856	82	27.75	5.9	4.5	14	18	56	68	39	48	13	16	**Decreasing Trend**	10.36	10	33
GRACE	PRO	95,693	150	2,737	60	42.57	5.1	2.8	27	19	37	62	18	30	6	10	**Decreasing Trend**	9.74	10	34
EMMETT NORTH BENCH	BRO	5,414	8	424	40	21	4.6	3.7	1	3	32	80	14	35	2	5	**Decreasing Trend**	6.85	7	35

*For this iteration, NPA nitrate concentrations between 2007–2011 and 2012–2016 were compared using previously established statistical methods and the threshold criteria analysis (DEQ 2014, Neely 2013). The methods and results of this nitrate trend analysis are presented in Nitrate Priority Area Trend Analysis, 2011-2016, DEQ 2020.

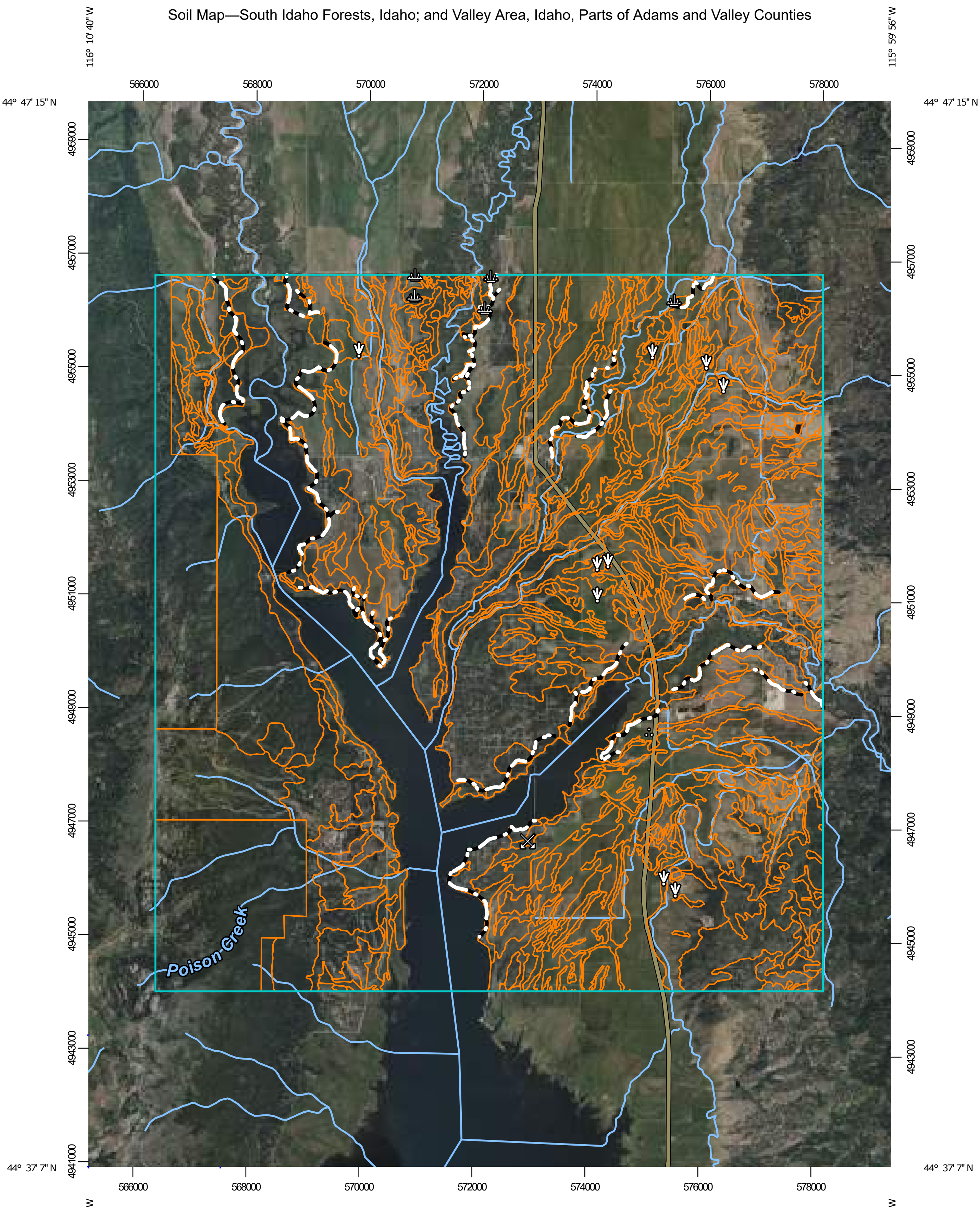
High Priority
Moderate - High Priority
Moderate Priority

Table 1. 2020 ranked Nitrate Priority Areas with score components.

HISTORIC NATIONAL REGISTRY

Reference number	Property Name	Status	Request Type	Category of Property	State	County	City	Street & Number	Federal Agencies	Level of Significance - International	Level of Significance - Local	Level of Significance - National	Level of Significance - Not Indicated	Level of Significance - State	Listed Date	Name of Multiple Property Listing	NHL Designated Date	Other Names	Park Name	Status Date	Area of Significance
00000327	Big Creek Commissary	Listed	Single	BUILDING	IDAHO	Valley	Big Creek	Yellow Pine, Payette National Forest	FOREST SERVICE	False	True	False	False	False	4/21/2000			Big Creek Barn; #1303 PY-797;10VY532		4/21/2000	ARCHITECTURE; POLITICS/GOVERNMENT
90000890	Cabin Creek Ranch	Listed	Single	DISTRICT	IDAHO	Valley	Black Butte	Cabin Cr. at jct. with Big Cr., Payette NF	FOREST SERVICE	False	True	False	False	False	6/27/1990			10VY143		6/27/1990	HISTORIC - NON-ABORIGINAL; AGRICULTURE; EXPLORATION/SETTLEMENT
82000366	Korvola. John. Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Donnelly	Roseberry Rd. and Farm to Market Rd.		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
82000369	Mahala. Jacob and Herman. Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Donnelly	N of Donnelly		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
82001053	Maki. Jacob. Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Donnelly	Off ID 55		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
82000363	Jarvi, Thomas, Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Lake Fork	E of Lake Fork on Finn Rd.		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
82000364	Johnson, John G., (Rintakangas) Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Lake Fork	NE of Lake Fork off Pearson Rd.		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR		Rintakangas		11/17/1982	ARCHITECTURE
82000365	Johnson. John S.. (Sampila) Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Lake Fork	NE of Lake Fork off Pearson Rd.		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR		Sampila		11/17/1982	ARCHITECTURE
82000368	Laituri. Gust. Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Lake Fork	NE of Lake Fork off Pearson Rd.		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
80001336	Long Valley Finnish Church	Listed	Single	BUILDING	IDAHO	Valley	Lake Fork	SE of Lake Fork		False	True	False	False	False	5/27/1980			"Finn" Church		5/27/1980	EXPLORATION/SETTLEMENT: ARCHITECTURE
82000370	Ojala, Herman, Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Lake Fork	NE of Lake Fork Off Pearson Rd.		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
82000371	Ruatsale, Matt, Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	Lake Fork	N of Kantola Lane		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
82002515	Elo School	Listed	Multiple	BUILDING	IDAHO	Valley	McCall	SE of ID 55 on Farm to Market Rd.		False	False	False	False	True	7/26/1982	Long Valley Finnish Structures TR				7/26/1982	ARCHITECTURE
82000362	Hill. Matt N.. Homestead Barn	Listed	Multiple	BUILDING	IDAHO	Valley	McCall	SE of McCall		False	True	False	False	False	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
100004675	Johnson Flying Service Hangar	Listed	Single	building	IDAHO	Valley	McCall	103 S. 3rd St.		False	True	False	False	False	11/20/2019			Pioneer Hangar		11/25/2019	TRANSPORTATION; CONSERVATION
82000367	Koski, Charles, Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	McCall	SE of McCall		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
100000905	Payette Lakes Club	Listed	Single	building	IDAHO	Valley	McCall	1585 Warren Wagon Rd.		False	True	False	False	True	4/24/2017			Payette Lake Club		5/4/2017	ARCHITECTURE; ENTERTAINMENT/RECREATION
80001337	Rice Meetinghouse	Listed	Single	BUILDING	IDAHO	Valley	McCall	NE of McCall		False	True	False	False	False	4/9/1980					4/9/1980	ARCHITECTURE
90000680	Southern Idaho Timber Protective Association (SITPA) Bui	Listed	Single	BUILDING	IDAHO	Valley	McCall	1001 State St.		False	True	False	False	False	5/2/1990			IHSI #85-15355: 015334-015362		5/2/1990	CONSERVATION: ARCHITECTURE
82000372	Wargelin, Nickolai, Homestead	Listed	Multiple	BUILDING	IDAHO	Valley	McCall	SE of McCall		False	False	False	False	True	11/17/1982	Long Valley Finnish Structures TR				11/17/1982	ARCHITECTURE
99000416	North Fork Payette River Bridge	Listed	Single	STRUCTURE	IDAHO	Valley	Smiths Ferry	ID 55, Approx. 2.5 mi. N of Smiths Ferry		False	False	False	False	True	4/2/1999			Rainbow Bridge; 85-2114		4/2/1999	ENGINEERING
90000681	Southern Idaho Timber Protective Association (SITPA) Bui	Listed	Single	DISTRICT	IDAHO	Valley	Smiths Ferry	SR 55		False	True	False	False	False	5/2/1990			015338-015353		5/2/1990	CONSERVATION; ARCHITECTURE
85002157	Braddock Gold Mining and Milling Company Log Building	Listed	Single	BUILDING	IDAHO	Valley	Thunder City	Off Pack Trail near Suicide Rock		False	True	False	False	False	9/12/1985			Forsythe.William.Cabin		9/12/1985	EXPLORATION/SETTLEMENT: ARCHITECTURE
87001186	Stibnite Historic District	Listed	Single	DISTRICT	IDAHO	Valley	Yellow Pine	US Forest Rd. 412	FOREST SERVICE	False	False	False	False	True	7/19/1987			Stibnite Mining District		7/19/1987	MILITARY
92000688	Krassel Ranger Station	Listed	Single	DISTRICT	IDAHO	Valley	Yellowpine	Along S Fork Salmon R., 11 mi. W of Yellowpine, Payette N	FOREST SERVICE	False	True	False	False	False	11/19/1992			10-VY-492 and PY-584		11/19/1992	PREHISTORIC; CONSERVATION; POLITICS/GOVERNMENT; ARCHITECTURE

Soil Map—South Idaho Forests, Idaho; and Valley Area, Idaho, Parts of Adams and Valley Counties



Map Scale: 1:91,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 1000, 2000, 4000, 6000

Feet: 0, 4000, 8000, 16000, 24000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: South Idaho Forests, Idaho
Survey Area Data: Version 6, Sep 2, 2022

Soil Survey Area: Valley Area, Idaho, Parts of Adams and Valley Counties
Survey Area Data: Version 20, Sep 2, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 25, 2020—Oct 12, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available	3,300.0	8.9%
Subtotals for Soil Survey Area		**3,300.0**	**8.9%**
Totals for Area of Interest		**36,934.5**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Archabal loam, 0 to 2 percent slopes	280.8	0.8%
2	Archabal loam, 2 to 4 percent slopes	551.3	1.5%
3	Archabal loam, 4 to 12 percent slopes	493.0	1.3%
4	Archabal loam, 12 to 20 percent slopes	94.8	0.3%
5	Blackwell clay loam	1,283.5	3.5%
6	Blackwell mucky silt loam	170.9	0.5%
7	Blackwell variant silt loam	65.5	0.2%
8	Bluebell cobbly loam, 5 to 35 percent slopes	670.8	1.8%
9	Bryan-Ligget complex, 20 to 40 percent slopes	58.5	0.2%
10	Bryan-Ligget complex, 40 to 60 percent slopes	1,217.6	3.3%
11	Bryan-Pyle complex, 40 to 60 percent slopes	48.1	0.1%
12	Cabarton silty clay loam	569.9	1.5%
14	Demast loam, 15 to 30 percent slopes	728.2	2.0%
15	Demast loam, 30 to 60 percent slopes	21.5	0.1%
16	Donnel sandy loam, 0 to 2 percent slopes	5,518.9	14.9%
17	Donnel sandy loam, 2 to 4 percent slopes	1,498.5	4.1%
18	Donnel sandy loam, 4 to 12 percent slopes	288.7	0.8%
20	Duston sandy loam, 0 to 2 percent slopes	208.8	0.6%
21	Duston sandy loam, 2 to 4 percent slopes	219.1	0.6%
22	Gestrin loam, 0 to 2 percent slopes	185.8	0.5%

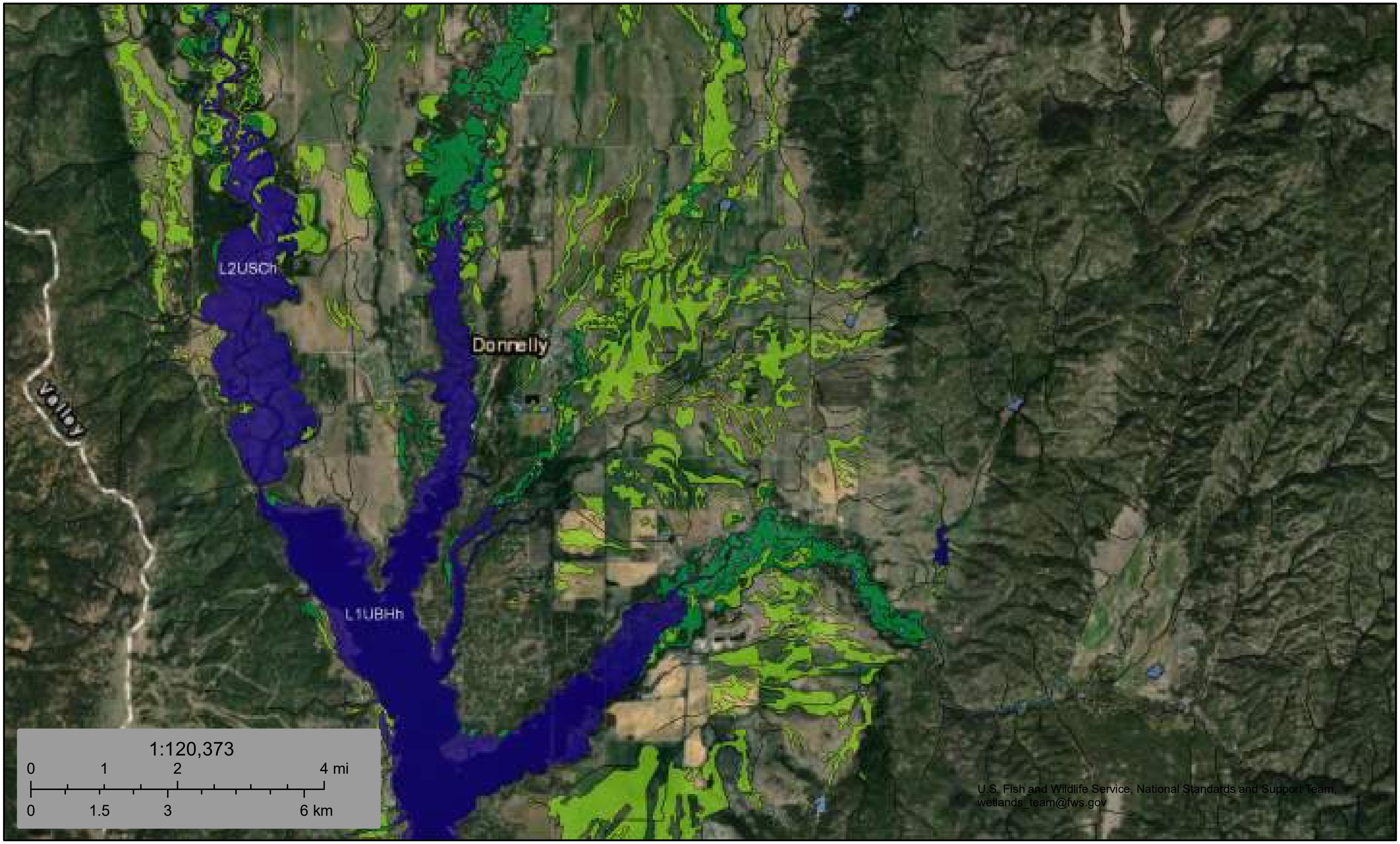
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
23	Gestrin loam, 2 to 4 percent slopes	594.1	1.6%
24	Gestrin loam, 4 to 12 percent slopes	96.0	0.3%
26	Jugson coarse sandy loam, 30 to 60 percent slopes	513.1	1.4%
27	Jurvannah sandy loam	119.1	0.3%
28	Kangas coarse sandy loam	535.8	1.5%
29	Kangas fine gravelly loamy coarse sand	804.8	2.2%
34	Melton loam	1,425.3	3.9%
37	Nisula loam, 4 to 12 percent slopes	641.2	1.7%
38	Nisula loam, 12 to 20 percent slopes	202.6	0.5%
40	Pits, gravel	39.2	0.1%
43	Quartzburg-Bryan complex, 10 to 45 percent slopes	830.5	2.2%
47	Roseberry coarse sandy loam	5,226.4	14.2%
48	Roseberry-Melton complex	729.7	2.0%
49	Shellrock loamy coarse sand, 12 to 35 percent slopes	497.2	1.3%
50	Shellrock loamy coarse sand, 35 to 60 percent slopes	259.9	0.7%
51	Shellrock-Rock outcrop complex, 2 to 25 percent slopes	117.5	0.3%
52	Shellrock-Rock outcrop complex, 25 to 60 percent slopes	341.7	0.9%
53	Sudduth variant loam, 3 to 20 percent slopes	351.1	1.0%
54	Swede silt loam, 2 to 4 percent slopes	5.6	0.0%
55	Swede silt loam, 4 to 12 percent slopes	124.7	0.3%
56	Swede silt loam, 12 to 20 percent slopes	18.2	0.0%
57	Takeuchi coarse sandy loam, 3 to 35 percent slopes	14.2	0.0%
58	Tica very cobbly loam, 4 to 65 percent slopes	140.8	0.4%
59	Water	5,824.8	15.8%
60	Miscellaneous water	1.6	0.0%
Subtotals for Soil Survey Area		**33,629.3**	**91.1%**
Totals for Area of Interest		**36,934.5**	**100.0%**

Legend

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands



August 9, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX G

Alternative Costs

NLRSWD

WWTP Facility Planning Study

Project Title: Downstream WW Lake Crossing Gravity Line Improvement

Big Smokey Trunkline Alternative 1

Location: Dawn Dr, Sandy Dr, Deedee Ln

Need for Project:
- The existing trunkline does not have adequate capacity to convey flows

Objective:
- Increase the capacity of the existing line

Design Considerations:
- Routing and separation requirements with other utilities
- Full lane replacement is assumed
- Construction assumed to take 45 days

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
18-inch Pipe - Excavation, Backfill	4,100	LF	$ 263	$ 1,076,700	
Manholes (60")	21	EA	$ 16,089	$ 337,900	
Full Lane Pavement Repair	4,100	LF	$ 101	$ 414,100	
Traffic Control - With Flagging	4,100	LF	$ 9	$ 37,700	
Bypass Pumping	45	/DAY	$ 800	$ 36,000	
				Construction Subtotal	*$ 1,902,400*
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 190,200	
Bonding			2.5%	$ 47,600	
Contractor Overhead and Profit			15%	$ 285,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 570,700	
				Total Construction Subtotal	*$ 2,997,000*
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 450,000	
Engineering - Construction Contract Administration			5%	$ 149,900	
Engineering - Inspection			5%	$ 149,900	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 20,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			3%	$ 90,000	
				Total Project Costs (rounded)	**$ 3,872,000**
Operations and Maintenance					
Labor/Equipment	40	YR	$ -	$ -	
Power	40	YR	$ -	$ -	
Short-Lived Asset Replacement	40	YR	$ -	$ -	
Subtotal					*$ -*
40-Year Life Cycle Cost					**$ 3,872,000**

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

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

NLRSWD

WWTP Facility Planning Study

Project Title: WW Lake Crossing Force Main Extension

Big Smokey Trunkline Alternative 2

Location: Dawn Dr, Sandy Dr, Deedee Ln

Need for Project:
- The existing trunkline does not have adequate capacity to convey 20-year flows

Objective:
- Extend the existing Lake Crossing force main to the Big Smoky Lift Station

Design Considerations:
- Routing and separation requirements with other utilities
- It was assumed that the additional friction head generated by increased length is offset by the change in static head, and no pump changes are needed

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pressure Pipe - Excavation, Backfill	4,100	LF	$ 214	$ 876,900	
Half Lane Pavement Repair	4,100	LF	$ 29	$ 117,800	
Connect to existing manhole (discharge manhole)	1	EA	$ 5,746	$ 5,800	
Electrical / Pump / Controls Upgrade	1	LS	$ 90,000	$ 90,000	
Air Release Valve	2	EA	$ 15,000	$ 30,000	
Bypass Pumping	45	DAY	$ 800	$ 36,000	
Cleanout (<=12")	2	EA	$ 11,492	$ 23,000	
				Construction Subtotal	***$ 1,179,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 118,000	
Bonding			2.5%	$ 29,500	
Contractor Overhead and Profit			15%	$ 176,900	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 353,900	
				Total Construction Subtotal	***$ 1,858,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 279,000	
Engineering - Construction Contract Administration			5%	$ 92,900	
Engineering - Inspection			5%	$ 92,900	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			3%	$ 20,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			3%	$ 55,800	
				Total Project Costs (rounded)	**$ 2,414,000**
Operations and Maintenance					
Labor / Equipment	40	YR	$ 1,600	$ 64,000	
Parts	40	YR	$ 1,000	$ 40,000	
Power	40	YR	-	-	
Short-Lived Asset Replacement	40	YR	$ 2,800	$ 112,000	$ 185,000
Subtotal					***$ 152,000***
40-Year Life Cycle Cost					**$ 2,566,000**

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

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

NLRSWD

WWTP Facility Planning Study

Project Title: Upstream Day/Wagon Lift Station Gravity Line Improvement Southern Trunkline Alternative 1	**Location: Hereford Rd.**

Need for Project:
- The existing trunkline does not have adequate capacity to convey flows

Objective:
- Increase the capacity of the existing line

Design Considerations:
- Routing and separation requirements with other utilities
- Full lane replacement is assumed
- Construction assumed to take 60 days

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
15-inch Pipe - Excavation, Backfill	6,200	LF	$ 245	$ 1,521,300	
Manholes (60")	23	EA	$ 16,089	$ 370,100	
Full Lane Pavement Repair	6,200	LF	$ 101	$ 626,200	
Traffic Control - With Flagging	6,200	LF	$ 9	$ 57,000	
Bypass Pumping	60	/DAY	$ 800	$ 48,000	
				Construction Subtotal	***$ 2,622,600***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 262,300	
Bonding			2.5%	$ 65,600	
Contractor Overhead and Profit			15%	$ 393,400	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 786,800	
				Total Construction Subtotal	***$ 4,131,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 620,000	
Engineering - Construction Contract Administration			5%	$ 206,600	
Engineering - Inspection			5%	$ 206,600	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 20,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			3%	$ 124,000	
				Total Project Costs (rounded)	**$ 5,324,000**

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

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

NLRSWD
WWTP Facility Planning Study

Project Title: Southern Regional Lift Station

Southern Trunkline Alternative 2

Location: Grand Fir Dr., Willow Rd.

Need for Project:
- The existing trunkline downstream of the DS Lake Crossing discharge does not have adequate capacity to convey flows

Objective:
- Construct a Regional lift station to bypass the undersized trunkline

Design Considerations:
- Routing and separation requirements with other utilities
- Includes the cost of gravity main to the lift station
- Land Aquisition for lift station
- Wetland construction/stream crossing
- Easement aquirement

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Large Lift Station (>=25 hp pumps)	1	LS	$ 861,891	$ 861,900	
10-inch Pressure Pipe - Excavation, Backfill	10,800	LF	$ 227	$ 2,447,900	
Connect to existing pipe	1	EA	$ 6,321	$ 6,400	
Cleanout (<=12")	5	EA	$ 11,492	$ 57,500	
10-inch Pipe - Excavation, Backfill	3,250	LF	$ 172	$ 560,300	
Manholes (48")	11	EA	$ 9,194	$ 101,200	
Half Lane Pavement Repair	5,400	LF	$ 29	$ 155,200	
Traffic Control - Without Flagging	5,400	LF	$ 5	$ 24,900	
Wetlands trenching and remediation	1,750	LF	$ 40	$ 70,000	
Miscellaneous Surface Repair	5,900	LF	$ 5	$ 27,200	
Gravel Repair	1,050	LF	$ 11	$ 11,600	
				Construction Subtotal	***$ 4,324,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 432,400	
Bonding			2.5%	$ 108,100	
Contractor Overhead and Profit			15%	$ 648,600	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 1,297,200	
				Total Construction Subtotal	***$ 6,811,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 1,022,000	
Engineering - Construction Contract Administration			5%	$ 340,600	
Engineering - Inspection			5%	$ 340,600	
Geotechnical Investigation			LS	$ 35,000	
Easements			LS	$ 50,000	
Land Acquisition			3%	$ 100,000	
Surveying			LS	$ 50,000	
Environmental & Permitting			LS	$ 75,000	
Legal, Administrative, and Funding			3%	$ 204,400	
				Total Project Costs (rounded)	**$ 9,029,000**
Operations and Maintenance					
Labor / Equipment	40	YR	$ 7,600	$ 304,000	
Parts	40	YR	$ 1,000	$ 40,000	
Power	40	YR	$ -	$ -	
Short-Lived Asset Replacement	40	YR	$ 15,200	$ 608,000	
Subtotal					***$ 608,000***
40-Year Life Cycle Cost					**$ 9,637,000**

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

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

NLRSWD

WWTP Facility Planning Study

Project Title: DS Lake Crossing Forcemain Extension

Southern Trunkline Alternative 3

Location: Spring Valley Rd.

Need for Project:
- The existing trunkline downstream of the DS Lake Crossing discharge does not have adequate capacity to convey flows

Objective:
- Extend the DS Lake Crossing to the WWTP and bypass the undersized trunkline

Design Considerations:
- Routing and separation requirements with other utilities
- Half lane and gravel road repair assumed where each type is present, miscellaneous surface for the remainder
- Wetland construction/stream crossing
- Easement aquirement

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pressure Pipe - Excavation, Backfill	12,000	LF	$ 214	$ 2,566,400	
Connect to existing pipe	2	EA	$ 6,321	$ 12,700	
Lift station Upgrades	1	LS	$ 150,000	$ 150,000	
Cleanout (<=12")	5	EA	$ 11,492	$ 57,500	
Half Lane Pavement Repair	4,400	LF	$ 29	$ 126,500	
Traffic Control - Without Flagging	4,400	LF	$ 5	$ 20,300	
Wetlands trenching and remediation	1,750	LF	$ 40	$ 70,000	
Miscellaneous Surface Repair	4,800	LF	$ 5	$ 22,100	
Gravel Repair	1,050	LF	$ 11	$ 11,600	
				Construction Subtotal	***$ 3,037,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 303,700	
Bonding			2.5%	$ 75,900	
Contractor Overhead and Profit			15%	$ 455,600	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 911,100	
				Total Construction Subtotal	***$ 4,784,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 718,000	
Engineering - Construction Contract Administration			5%	$ 239,200	
Engineering - Inspection			5%	$ 239,200	
Geotechnical Investigation			3%	$ 15,000	
Easements			LS	$ 50,000	
Surveying			LS	$ 40,000	
Environmental & Permitting			LS	$ 75,000	
Legal, Administrative, and Funding			3%	$ 143,600	
				Total Project Costs (rounded)	**$ 6,304,000**
Operations and Maintenance					
Labor / Equipment	40	YR	$ 3,000	$ 120,000	
Parts	40	YR	$ 1,000	$ 40,000	$ 683,000
Power	40	YR	$ (5,000)	$ (200,000)	
Short-Lived Asset Replacement	40	YR	$ 3,500	$ 140,000	
Subtotal					***$ 100,000***
40-Year Life Cycle Cost					**$ 6,404,000**

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

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

APPENDIX H

2020 Rate Study

KELLER ASSOCIATES

Technical Memo

TO: Travis Pryor – North Lake Recreational Sewer and Water District

FROM: James Bledsoe, P.E.
Jason King, P.E.

DATE: November 12, 2020

SUBJECT: Water and Wastewater User Rate Study

PROFESSIONAL ENGINEER
REGISTERED
DocuSigned by:
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11/12/2020
STATE OF IDAHO
JAMES L. BLEDSOE

INTRODUCTION

The North Lake Recreational Sewer and Water District (District) owns and operates water and wastewater utilities in the area around Lake Cascade. The water system includes a 1.25-million-gallon water storage tank, eight wells, fire hydrants, pressure reducing valves, water meters, and approximately 15.5 miles of water mainlines. The wastewater system includes a mechanical Wastewater Treatment Plant (WWTP), 20 lift stations, and approximately 62 miles of sewer mainlines. The District's wastewater system also receives wastewater from the City of Donnelly.

The District engaged Keller Associates, Inc. to evaluate the existing user rates and make recommendations for water and sewer rates that would address the District's operations and maintenance requirements, short-lived asset replacement needs, existing deficiencies identified by District staff, and outstanding capital improvement upgrades previously identified in the Wastewater Master Plan completed in 2006.

Background

Water and wastewater user rates are used to provide the funds required to operate water and wastewater systems. These funds are used to pay for operations and maintenance and system component replacements. Billing rates are based on the number of residential equivalent dwelling units (EDUs); 1 EDU is assigned for each residential connection, and an equivalent EDU is estimated for non-residential connections. As of June 31, 2020, the District provided water and wastewater services to 709 water EDUs and 2410 wastewater EDUs. A summary of the water and wastewater EDUs serviced by the District is provided in Table 1.

TABLE 1: 2020 DISTRICT EDU SUMMARY[1]

Water System	Number EDUs	% of Total
Tamarack	423	59.7%
Non-Tamarack	286	40.3%
Total Water EDUs	*709*	
Wastewater System	**Number EDUs**	**% of Total**
Tamarack	423	17.6%
Non-Tamarack	1987	82.4%
Total Wastewater EDUs	*2410*	

[1]Number of EDUs as of June 31, 2020

The District currently charges a flat rate of $24.00 per month per EDU (/month/EDU) for all sewer users. The water rate structure is separated by Tamarack and non-Tamarack water users; a flat rate of $24.00/month/EDU and $38.00/month/EDU is charged to non-Tamarack and Tamarack users, respectively. User rates generally increase by a small percentage each year to account for inflation of maintenance and operations costs. For the District, rates were increased in 2005 and 2009. With the exception of a $4/month/EDU rate adjustments to water and wastewater made in 2017, no other user rate adjustments have been made over the last 11 years. As a result, the replacement budgets have largely been underfunded. This has made it difficult to complete needed replacements (i.e. new membranes at the WWTP) and preventative maintenance activities without utilizing connection fee revenues from new growth.

WATER AND WASTEWATER USAGE

Keller Associates reviewed water usage and wastewater flows and flow data for Tamarack non-Tamarack users. The analysis shows that Tamarack and non-Tamarack water users used similar volumes of water per EDU on an annual basis; however, the non-Tamarack costumers used more water under max day and max month conditions as a result of higher irrigation use. However, it should be noted that the analysis of Tamarack's water usage does not account for the additional irrigation usage associated with Tamarack's privately owned irrigation wells.

Tamarack wastewater annual average flows are approximately 70% than non-Tamarack flows. Under the max day and max month conditions, Tamarack flows were about three times more wastewater per EDU than non-Tamarack users. Higher wastewater flow rates from Tamarack are a result of infiltration and inflow entering the collection system. For additional analysis and information on water usage and wastewater flow data, refer to Attachment A.

FINANCIAL SUMMARY

A summary of revenues and expenses was compiled using past financial information provided by the District. Historically, the District has tracked many wastewater and water revenues and expenses together. Keller Associates reviewed the last three years of audit information provided by the District. These audits provided limited breakdown in terms of revenues and expenses. After reviewing the information and limited supplemental data from the District, it was felt that the more detailed FY 2020 budget and FY 2020 actual expenses/revenues would provide the best starting point for the user rate analysis.

To estimate recommended user rates the District's revenue and expenses were separated by utility for the current budget year. Most of the revenue and expenses were able to be separated based on the information provided by the District (water connection fees, lift station maintenance, etc.); however, other sources, such as property taxes, were proportioned to the water and wastewater utilities based on the total number of water and sewer EDUs. A summary of the 2020 water and wastewater budgets is provided in Table 2. A breakdown of the budget allocations can be found in Attachment B.

KELLER ASSOCIATES

TABLE 2: DISTRICT FINANCIAL SUMMARY

Category	2020 Water System Budget (rounded)	2020 Wastewater System Budget (rounded)
Revenue		
Total Operating Revenue	$ 371,500	$ 999,300
Total Capital Revenue	$ 37,500	$ 182,500
Total Revenue	*$ 409,000*	*$ 1,181,800*
Expenses		
Total Operating Expenses	$ 223,400	$ 965,400
Total Replacement Expenses	$ 30,600	$ 215,600
Total Debt Expenses	$ -	$ -
Total Capital Improvements	$ -	$ 175,000
Total Expenses	*$ 254,000*	*$ 1,356,000*
Revenue Less Expenses	**$ 155,000**	**$ (174,200)**

Moving forward, Keller Associates recommends that revenues and expenses for the water and wastewater utilities be tracked independently. This is especially important as the majority of the District's users do not have both District-provided utilities available to them, and care should be taken such that one utility does not subsidize another.

Based on current replacement schedules, the financial summary shows that the 2020 water system budget had a $155,000 surplus while the 2020 wastewater system budget had a $174,200 deficit. Additionally, it appears that the wastewater system is currently subsidized with capital revenues (connection fees). Capital revenues are generally designated to be used for capital improvements such as system expansions and upgrades, although they can be used for system replacements. A more detailed financial breakdown is provided in Attachment B.

Water System Short-Lived Asset Replacements

The water system includes equipment that wears out and needs to be replaced. These items are generally referred to as short-lived assets. The water system short-lived assets include pipelines, fire hydrants, wells, etc. To develop recommended replacement budgets, costs were estimated for each asset that will be replaced, and an annual replacement budget was calculated by dividing the replacement budget by the estimated useful life of the asset. These costs were then used to approximate an annual replacement budget for the water system. A summary of the short-lived assets and their respective annual replacement budgets are presented in Table 3.

TABLE 3: ANNUAL WATER SYSTEM REPLACEMENT BUDGET

Short Lived Asset	Annual Replacements (2020 Dollars)
Vehicles and Equipment	$ 7,000
Pipelines[1]	$ 67,300
Fire Hydrants	$ 20,400
PRVs	$ 2,200
Water Meters	$ 10,500
Small Wells	$ 41,000
Large Wells	$ 112,000
Storage Tank	$ 5,000
Total Annual Replacement Budget (rounded)	**$ 265,400**

[1]Annual costs are calculated by estimating replacing 1% of piping per year

The total annual water system replacement budget is approximately $265,000. In 2020, approximately $30,000 was budgeted in the water system for asset replacements. To fully fund the annual water replacement budget, it would require an additional $235,000. To reduce the initial budget and user rate increase it is recommended that the pipelines and hydrants replacement budgets be phased in over time. Phasing in these improvements will also allow the District to identify and prioritize these improvements. A recommended water short-lived asset funding schedule is presented in Table 4. This schedule should be revised and updated every few years to better assess current and anticipated conditions. Establishing reserve funds for system replacement projects will also allow the District to maintain acceptable levels of service. A more detailed breakdown of the water system replacement budget is provided in Attachment C.

TABLE 4: WATER SYSTEM SHORT LIVED ASSET REPLACEMENT FUNDING SCHEDULE[1]

SLA Item	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Vehicles and Equipment	$ 7,200	$ 7,400	$ 7,600	$ 7,900	$ 8,100
Pipeline Replacements[2]	$ 6,900	$ 14,300	$ 22,100	$ 30,300	$ 39,000
Fire Hydrant Replacements[3]	$ 4,200	$ 8,700	$ 13,400	$ 18,400	$ 23,600
PRV Replacements	$ 2,300	$ 2,300	$ 2,400	$ 2,500	$ 2,600
Water Meter Replacements	$ 10,800	$ 11,100	$ 11,500	$ 11,800	$ 12,200
Small Well Replacements	$ 42,200	$ 43,500	$ 44,800	$ 46,100	$ 47,500
Large Well Replacements	$ 115,400	$ 118,800	$ 122,400	$ 126,100	$ 129,800
Storage Tank Replacements	$ 5,200	$ 5,300	$ 5,500	$ 5,600	$ 5,800
Total Annual Cost (rounded)	**$ 194,200**	**$ 211,400**	**$ 229,700**	**$ 248,700**	**$ 268,600**

[1]Costs adjusted for 3.0% inflation

[2]Pipeline replacements are 10% funded in 2021 with funding increasing by 10% until fully funded by FY 2030

[3]Hydrant replacements are 20% funded in 2021 with funding increasing by 20% until fully funded by FY 2025

Wastewater System Short-Lived Asset Replacements

Short-lived assets in the wastewater system include pipelines, manholes, lift stations, and the WWTP. By summarizing the approximate replacement costs for each of the wastewater short-lived assets, annual replacement budgets were calculated for each item using the estimated useful life of the asset. The estimated wastewater system short-lived asset annual replacement budget is shown in Table 5. A more detailed breakdown of how these budgets were estimated is included in Attachment C.

TABLE 5: ANNUAL WASTEWATER SYSTEM REPLACEMENT BUDGET

Short Lived Asset	Annual Replacements (2020 Dollars)	
Vehicles and Equipment	$	23,000
Gravity Sewer Pipelines[1]	$	367,600
Pressure Sewer Pipelines[1]	$	302,800
Manholes	$	55,500
Collection System Piping Subtotal	*$*	*748,900*
Small Lift Stations	$	165,000
Medium Lift Stations	$	74,000
WWTP	$	387,900
Lift Station and WWTP Subtotal	*$*	*626,900*
Total Annual Replacement Budget (rounded)	**$**	**1,375,800**

[1]Annual costs are calculated by estimating replacing 1% of the total sewer piping per year

In 2020, approximately $215,600 was budgeted for wastewater short-lived asset replacements. Of this approximately $97,000 was allocated for ongoing membrane replacements at the WWTP. An additional $1.1 million would be needed to fully fund the annual wastewater replacements shown in Table 5. Two of the largest expenses are for gravity and pressure sewer line replacements. To reduce the initial budget and user rate increase, it is recommended that pipeline and manhole replacements be phased in over the next 12-years. A recommended wastewater short-lived asset replacement funding schedule is presented in Table 6. A complete description of the wastewater system replacement budget is provided in Attachment C.

TABLE 6: WASTEWATER SYSTEM SHORT LIVED ASSET REPLACEMENT FUNDING SCHEDULE[1]

SLA Item	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Vehicles and Equipment	$ 23,700	$ 24,400	$ 25,100	$ 25,900	$ 26,700
Gravity Sewer Pipelines[2]	$ 31,600	$ 65,000	$ 100,400	$ 137,900	$ 177,600
Pressure Sewer Pipelines[2]	$ 26,000	$ 53,500	$ 82,700	$ 113,600	$ 146,300
Manholes[2]	$ 4,800	$ 9,800	$ 15,200	$ 20,800	$ 26,800
Small Lift Stations	$ 170,000	$ 175,000	$ 180,300	$ 185,700	$ 191,300
Medium Lift Stations	$ 76,200	$ 78,500	$ 80,900	$ 83,300	$ 85,800
WWTP	$ 399,500	$ 411,500	$ 423,900	$ 436,600	$ 449,700
Total Annual Cost (rounded)	**$ 731,800**	**$ 817,700**	**$ 908,500**	**$ 1,003,800**	**$ 1,104,200**

[1]Costs adjusted for 3.0% inflation

[2]Pipeline and manhole replacements are phased in over 12 years

Capital Improvement Projects

Several capital improvement projects (CIP) were identified for the water and wastewater systems with the help of the District. Costs were estimated for the capital projects based on experience and the District's input. A summary of the water and wastewater capital improvements are presented in Tables 7 and 8, respectively.

TABLE 7: WATER SYSTEM CAPITAL IMPROVEMENTS FUNDING SCHEDULE[1]

Capital Improvement Item	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Water Master Plan and GIS Mapping	$ 206,000	$ -	$ -	$ -	$ -
Tamarack SCADA	$ 378,000	$ -	$ -	$ -	$ -
Total Annual Cost (rounded)	**$ 584,000**	**$ -**	**$ -**	**$ -**	**$ -**

[1]Costs adjusted for 3.0% inflation

TABLE 8: WASTEWATER SYSTEM CAPITAL IMPROVEMENTS FUNDING SCHEDULE[1]

Capital Improvment Item	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Sewer Master Plan and GIS Mapping	$ 206,000	$ -	$ -	$ -	$ -
Solid Handling Facility	$ 61,800	$ 191,000	$ 1,923,200	$ -	$ -
Septage Handling	$ 283,300	$ -	$ -	$ -	$ -
Lagoon Dredging	$ -	$ -	$ 327,800	$ -	$ -
Headwords Improvements	$ 148,300	$ 1,120,300	$ -	$ -	$ -
Total Annual Cost	**$ 699,400**	**$ 1,311,300**	**$ 2,251,000**	**$ -**	**$ -**

[1]Costs adjusted for 3.0% inflation

[2]All projects are assumed to be cash financed expect the construction of the solid handling facility (FY 2023)

These summaries only account for the immediate needs of the District. When the water and wastewater master plans are completed (recommended in FY 2021), additional capital improvements are expected to be identified. The master planning effort should revise the user rate structures to address additional capital projects.

The water system capital improvement projects are recommended to be financed with the cash reserve that the District currently maintains. Currently, no debt financing is projected. However, if debt financing is required in the future, the debt payment is anticipated to be $8.27/month/EDU for every $1 million financed (assuming a 20-year loan at 3.5% interest).

For the wastewater system, all the capital improvements identified are recommended to be financed with the District cash reserve except for the construction of the solid handling facility (FY 2023) which was assumed to be debt-financed in this user rate analysis. It is estimated that wastewater system capital improvement financing will cost $2.40/month/EDU for every $1 million financed (assuming a 20-year loan at 3.5%).

RATE PROJECTION MODELS

Using the data provided by the District, it is evident that a substantial water and wastewater rate increase is required to fund the replacement needs of the systems. Five-year rate projection models were developed for the water and wastewater utilities. For each model, two rate adjustment strategies were evaluated. The first rate increase strategy included a single, large rate increase for both the water and wastewater systems in the first year. Each following year, the rate increased by 5%. The second rate increase strategy phased a rate increase over two years followed by 5% rate increases for the remaining years.

Water Rate Projections

As discussed previously, the District currently charges different water usage rates for Tamarack and non-Tamarack users. As of June 2020, Tamarack users paid $14/month/EDU more than non-Tamarack users. The 1-year water rate increase model includes a $10/month/EDU rate increase for both Tamarack and non-Tamarack users beginning in FY 2021. This rate increase represents a 26% (Tamarack) and a 42% (non-Tamarack) rate increase. The non-Tamarack user water rate increase by 5% each following year. The Tamarack rate increase from FY 2022 to FY 2025 is the same as the non-Tamarack rate increase to maintain a rate difference of $14/month/EDU. Reevaluating the cost of service (and associated cost differentials) for Tamarack and non-Tamarack users was beyond the scope of this study. A summary of the 1-year water rate increase model is provided in Table 9. The complete 1-year water rate model, including the assumptions made, is provided in Attachment D.

TABLE 9: 1-YEAR WATER RATE INCREASE

	Budget FY 2020	Forecast FY 2021	Forecast FY 2022	Forecast FY 2023	Forecast FY 2024	Forecast FY 2025
Non-Tamarack Water Rate[1]	$ 24.00	$ 34.00	$ 35.70	$ 37.50	$ 39.40	**$ 41.40**
Tamarack Water Rate[1]	$ 38.00	$ 48.00	$ 49.70	$ 51.50	$ 53.40	**$ 55.40**
% Rate Increase	-	26% - 42%	5%	5%	5%	5%
Total Revenues	$ 408,900	$ 496,000	$ 515,600	$ 536,400	$ 557,500	$ 580,700
Total Expenditures	$ 254,000	$ 1,008,100	$ 448,200	$ 473,600	$ 499,900	$ 527,300
Ending Account Balance[2]	**$ 1,359,100**	**$ 847,000**	**$ 914,400**	**$ 977,200**	**$ 1,034,800**	**$ 1,088,200**

[1]Rate per EDU per month

[2]Basis on an initial account balance provided in the 2019 Financial Audit

As shown in Table 9, the water system budgeted revenue in FY 2020 exceeds the expenditures; however, as discussed, the FY 2020 budget did not adequately fund system replacement budgets. The recommended system replacement budgets are applied to the 2021 through 2025 fiscal years. It should be noted that the water system capital improvement projects (approximately $584,000) were included in the FY 2021 expenditures. These improvements are expected to be cash financed by the District. The 1-year rate model results in a slight increase in the water system account balance each year after FY 2021 and an account balance of approximately $1.12 million at the end of FY 2025.

The 2-year water rate increase alternative includes a $6/month/EDU rate increase in FY 2021 and again in FY 2022. This results in a 25% (FY 2021) and a 20% (FY 2022) rate increase for non-Tamarack users. The Tamarack users will have a 16% (FY 2021) and a 14% (FY 2022) rate increase. Each subsequent year, a 5% rate increase will be applied to the non-Tamarack users. Like the 1-year rate increase alternative, the $14/month/EDU differential between the Tamarack and non-Tamarack users was maintained. A summary of the results of the 2-year water rate increase alternative is presented in Table 10. The full 2-year water rate model is provided in Attachment D.

TABLE 10: 2-YEAR PHASED WATER RATE INCREASE

	Budget FY 2020	Forecast FY 2021	Forecast FY 2022	Forecast FY 2023	Forecast FY 2024	Forecast FY 2025
Non-Tamarack Water Rate[1]	$ 24.00	$ 30.00	$ 36.00	$ 37.80	$ 39.70	**$ 41.70**
Tamarack Water Rate[1]	$ 38.00	$ 44.00	$ 50.00	$ 51.80	$ 53.70	**$ 55.70**
% Rate Increase	-	16% - 25%	14% - 20%	5%	5%	5%
Total Revenues	$ 408,900	$ 461,800	$ 518,200	$ 538,900	$ 560,100	$ 583,300
Total Expenditures	$ 254,000	$ 1,008,100	$ 448,200	$ 473,600	$ 499,900	$ 527,300
Ending Account Balance[2]	**$ 1,350,100**	**$ 812,800**	**$ 882,800**	**$ 948,100**	**$ 1,008,300**	**$ 1,064,300**

[1]Rate per EDU per month

[2]Basis on an initial account balance provided in the 2019 Financial Audit

For both the 1-year and 2-year rate increase alternatives, the recommended replacement budgets are included in the FY 2021 to FY 2025 expenditures. Additionally, it should be noted that the water system capital improvement projects (approximately $584,000) were included in the FY 2021 expenditures. These improvements are expected to be cash financed by the District. The 2-year rate increase alternative results in a slight increase in the water system account balance each year after FY 2021 and account balance of approximately $1.10 million at the end of FY 2025.

It is generally recommended that public utilities maintain a cash reserve fund of at least 6-months operating expenses. Including the increased funding for the water system replacements, a 6-month reserve of the District amounts to approximately $260,000 (FY 2025). Both the 1- and 2-year water rate models exceed the recommended cash reserve. The two water rate models result in nearly the same user rates at the end of FY 2025 with similar impacts on the District's cash reserve. Maintaining the current cash reserves in the water models will allow the District to complete additional capital improvements while mitigating the need for incurring additional debt in the future. More importantly, recommended user rates will provide a more sustainable user utility, allowing for user rates to pay for the ongoing replacement of existing assets.

Wastewater Rate Projections

The District currently charges a flat wastewater rate of $24/month/EDU for both Tamarack and non-Tamarack users. With the significant increase in system replacement costs, the 1-year wastewater rate increase alternative requires a $24/month/EDU rate increase with a 5% rate increase each following year. A summary of the rate impacts is provided in Table 11.

TABLE 11: 1-YEAR WASTEWATER RATE INCREASE

	Budget FY 2020	Forecast FY 2021	Forecast FY 2022	Forecast FY 2023	Forecast FY 2024	Forecast FY 2025
Wastewater Rate[1]	$ 24.00	$ 48.00	$ 50.40	$ 53.00	$ 55.70	**$ 58.50**
% Rate Increase	-	100%	5%	5%	5%	5%
Total Revenues	$ 1,181,800	$ 1,806,300	$ 1,897,600	$ 1,995,400	$ 2,097,300	$ 2,199,000
Total Expenditures[2]	$ 1,356,000	$ 2,310,300	$ 3,034,500	$ 2,304,300	$ 2,099,800	$ 2,229,000
Ending Account Balance[3]	**$ 3,918,900**	**$ 3,414,900**	**$ 2,278,000**	**$ 1,969,100**	**$ 1,966,600**	**$ 1,936,600**

[1]Rate per EDU per month

[2]Assuming debt financing of the solid handling facility construction costs

[3]Basis on an initial account balance provided in the 2019 Financial Audit

The 2-year wastewater rate increase alternative requires a $13/EDU/month rate increase in both FY 2021 and 2022. The 2-year rate increase also includes a 5% annual rate increase starting FY 2023. A summary of the 2-year wastewater rate alternative is shown in Table 12. Additional details on both the 1-year and 2-year scenarios are found in Attachment D.

TABLE 12: 2-YEAR PHASED WASTEWATER RATE INCREASE

	Budget FY 2020	Forecast FY 2021	Forecast FY 2022	Forecast FY 2023	Forecast FY 2024	Forecast FY 2025
Wastewater Rate[1]	$ 24.00	$ 37.00	$ 50.00	$ 52.50	$ 55.20	**$ 58.00**
% Rate Increase	-	54.2%	50.0%	5%	5%	5%
Total Revenues	$ 1,181,800	$ 1,486,500	$ 1,885,900	$ 1,980,700	$ 2,082,500	$ 2,184,100
Total Expenditures[2]	$ 1,356,000	$ 2,310,300	$ 3,034,500	$ 2,304,300	$ 2,099,800	$ 2,229,000
Ending Account Balance[3]	**$ 3,918,900**	**$ 3,095,100**	**$ 1,946,500**	**$ 1,622,900**	**$ 1,605,600**	**$ 1,560,700**

[1]Rate per EDU per month

[2]Assuming debt financing of the solid handling facility construction costs

[3]Basis on an initial account balance provided in the 2019 Financial Audit

For both the 1 and 2-year wastewater rate models, the expenses in FY 2021, 2022, and 2023 are much higher than the estimated revenues. The difference in expenses and revenue is due to using the cash reserve to fund the wastewater capital improvement projects identified in Table 8. It is important to note that projected user rate revenues do not provide enough revenue to fully fund capital expenses (i.e. solid handling facility) in FY 2023. The solids handling facility is anticipated to be debt-financed. Keller Associates recommends that the user rate models be updated once the facility planning study is completed and preliminary planning for the solid handling facility has been completed.

It is also recommended that the District maintain a minimum of a 6-month cash reserve. Using the FY 2025 expenses, a 6-month reserve of $1 million is recommended for the wastewater system. Both the 1- and 2-year wastewater rate increase provide at least a 6-month minimum cash reserve; however, the 1-year rate model results in a cash reservice almost $400,000 greater than the 2-year rate increase.

RECOMMENDATIONS

Keller Associates recommends that the District move forward with user rate increases. Failure to increase user rates will make it more difficult to fund ongoing replacement needs, putting the District more at risk of system failures, permit violations, and disruptions to service. The 1-year rate increase provides the District with the required revenue to begin funding system replacement next year (FY 2021). In addition, the 1-year wastewater rate increase results in a cash reserve that is approximately $400,000 more than the 2-year wastewater rate increase. Keller Associates recommends user rate adjustments be put in place as soon as possible, and that the District actively work toward fully funding system replacements.

Currently, the District maintains a single account with all water and wastewater system funds combined. It is recommended that the District manages the water and wastewater system accounts separately. This will allow for easier accounting for system revenues and expenses. Additionally, managing the accounts separately will prevent revenue from one system from subsidizing the other system. Finally, tracking replacement and capital expansion/upgrade related expenses separately will make it easier for the District to assess whether user rates are sufficiently funding operations, maintenance, and replacement needs.

As noted in the water usage and wastewater flow analysis, the Tamarack system appears to be highly influenced by infiltration and inflow resulting in larger wastewater flows (Attachment A). It is recommended that the District focus on reducing the infiltration and inflow in the Tamarack wastewater system.

Although this study provides reasonable insight into the required rate increases for the water and wastewater system, it is recommended that the District proceed with master planning efforts to define future capital needs and their potential impact on user rates. The master planning will allow the District to identify additional capital projects that may be required.

In the future, the District could consider alternative rate structures. Currently, the District charges a flat water and wastewater rate regardless of usage. A potential future rate structure could include the implementation of individual, meter-based billing. A meter-based rate structure encourages individuals to conserve and use less water and could result in a more equitable allocation of costs among individual users.

ATTACHMENTS

ATTACHMENT A – Water Usage and Wastewater Flow Analysis

ATTACHMENT B – Detailed Financial Summary

ATTACHMENT C – Water and Wastewater System Replacement Budgets

ATTACHMENT D – Water and Wastewater Rate Models

ATTACHMENT A

Water Usage and Wastewater Flow Analysis

KELLER ASSOCIATES

Attachment A – Water Usage and Wastewater Flow Analysis

An analysis of the water usage and wastewater flows was completed to compare the water usage and wastewater flows per EDU by Tamarack users to non-Tamarack users.

Water Usage Analysis

An analysis of the water usage by the District was based on well production data. The District currently operates eight potable water wells. Each well is equipped with a flow meter to measure the volume of water pumped from the well. Two of the wells are used to provide water to the Tamarack potable water system. Using this information, the average day (Table A-1), maximum day (Table A-2), and maximum month (Table A-3) water usage per EDU was calculated for the Tamarack and non-Tamarack users.

TABLE A-1: AVERAGE DAY WATER USAGE PER EDU

Year	Tamarack (gal/day/EDU)	Non-Tamarack (gal/day/EDU)	Total System (gal/day/EDU)
2018	212	220	215
2019	264	242	255

TABLE A-2: MAX DAY WATER USAGE PER EDU

Date	Tamarack (gal/day/EDU)	Non-Tamarack (gal/day/EDU)	Total System (gal/day/EDU)
8/11/2018	464	1,094	718
7/12/2019	858	923	884

TABLE A-3: MAX MONTH WATER USAGE PER EDU

Date	Tamarack (gal/day/EDU)	Non-Tamarack (gal/day/EDU)	Total System (gal/day/EDU)
8/2018	455	799	594
7/2019	664	788	714

This analysis shows that, on average, the Tamarack and non-Tamarack users consume the similar amounts of water per EDU except in the summer months when non-Tamarack users consume almost 100% more water (2018, Tables A-2 and A-3). To better understand the differences in water usage between Tamarack and non-Tamarack users, the average daily water usage per EDU is presented in Figure A-1.

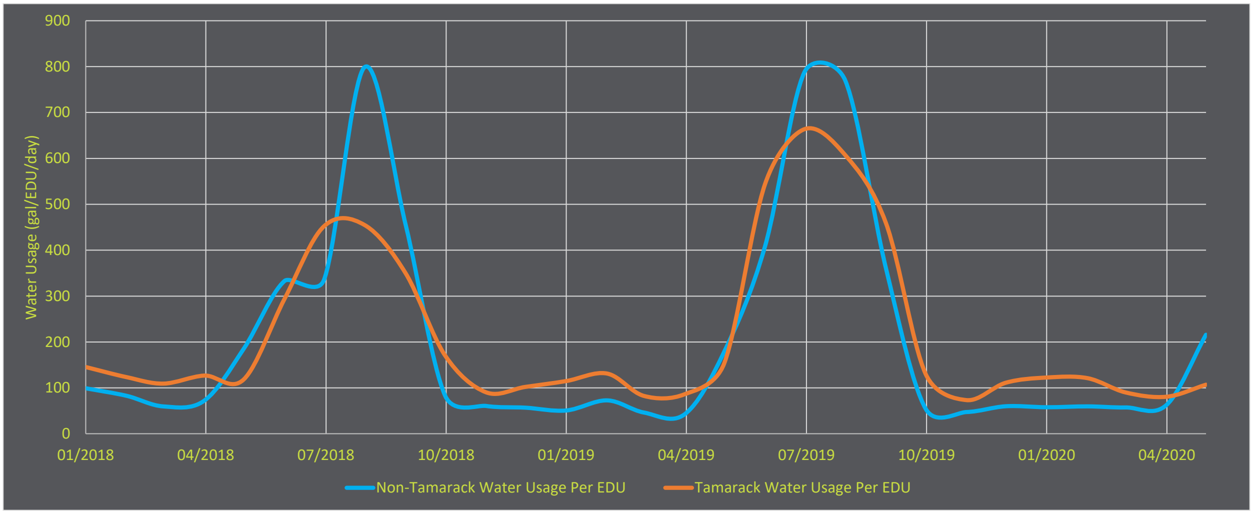

FIGURE A-1: AVERAGE DAILY WATER USAGE PER EDU

The average daily water usage shown in Figure 1 shows that non-Tamarack users consume more water in the summer months and less water in the winter months than the Tamarack users. This results in the average daily water usage per EDU by Tamarack users and non-Tamarack users being similar. It should be noted, however, that this comparison is for the potable water use only, and that Tamarack usage does not account for the irrigation usage from Tamarack's irrigation wells. The irrigation wells are owned and operated by Tamarack and not the District.

Wastewater Flow Analysis

An analysis of wastewater flows was completed using data collected at the wastewater treatment plant (WWTP) and the Poison Creek Lift Station. The Poison Creek Lift Station pumps all the wastewater produced by the Tamarack users to the WWTP. Poison Creek has a flow meter to measure the volume of wastewater that is pumped to the WWTP. The WWTP also has a flow meter at the headworks to measure the total wastewater that is collected at the plant. The non-Tamarack wastewater flows were calculated by subtracting the Poison Creek flow data from the WWTP flow data. Using this information, the average day (Table A-4), maximum day (Table A-5), and maximum month (Table A-6) water usage was calculated for the Tamarack and non-Tamarack users.

TABLE A-4 AVERAGE DAY WASTEWATER FLOW PER EDU

Year	Tamarack (gal/day/EDU)	Non-Tamarack (gal/day/EDU)	Total System (gal/day/EDU)
2018	133	78	88
2019	150	88	99

TABLE A-4: AVERAGE DAY WASTEWATER FLOW PER EDU

Date	Tamarack (gal/day/EDU)	Non-Tamarack (gal/day/EDU)	Total System (gal/day/EDU)
4/9/2018	505	163	223
4/9/2019[1]	1,492	547	713

TABLE A-6: MAX MONTH WASTEWATER FLOW PER EDU

Date	Tamarack (gal/day/EDU)	Non-Tamarack (gal/day/EDU)	Total System (gal/day/EDU)
4/2018	334	112	151
4/2019	600	207	276

This wastewater flow analysis shows that, on average, the Tamarack users produce approximately 70% more wastewater than the non-Tamarack users (Table A-4); however, the max day and max month wastewater flows indicate that Tamarack users produce significantly higher flows per EDU. To better understand the differences in wastewater flows between Tamarack and non-Tamarack users, the average daily wastewater flows are plotted in Figure A-2.

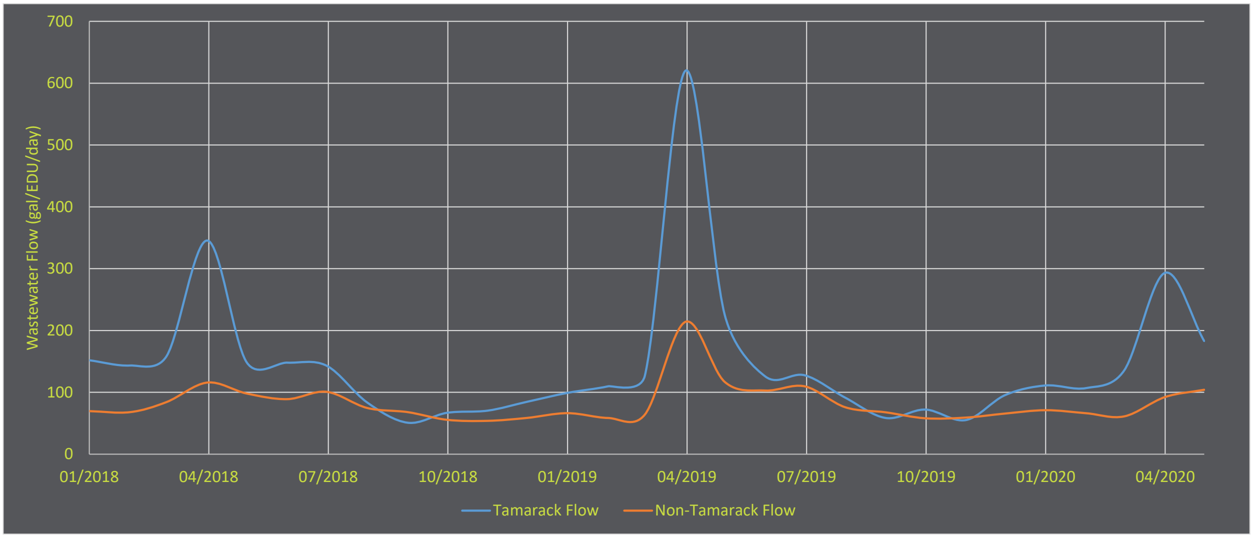

FIGURE A-2: AVERAGE DAILY WASTEWATER FLOW PER EDU

The average daily flows presented in Figure 2 shows large wastewater flow spikes in April each year in Tamarack. April is typically when large portions of the snowpack melt and infiltrate into the ground. This data and notes from the District's employees, indicate that the Tamarack wastewater collection is significantly influenced by infiltration and inflow into the collection system resulting in higher wastewater flows.

ATTACHMENT B

Detailed Financial Summary

KELLER
ASSOCIATES

North Lake Recreational Sewer and Water District
User Rate Study: Water Usage Rates
2020 Water Revenues Summary
Fiscal Year Dec. 1, 2019 To Nov 30, 2020

Fund 1: Operating Funds

Water Revenue Source	2020 Budget	Revenue through 6/30/2020	Anticipated 2020 Revenue[1]	Baseline Revenues[2]
Water Usage Revenue	$ 86,400	$ 47,328	$ 81,134	$ 82,368
Water Usage Revenue - Tamarack	$ 181,440	$ 110,846	$ 190,022	$ 192,888
Tax Revenue - Valley County	$ 50,472	$ 38,236	$ 50,000	$ 50,000
LID Administrative Fees	$ 40,027	$ 642	$ 1,100	$ 40,027
Inspection Fees - Water	$ 1,125	$ 765	$ 1,311	$ 1,000
Water Turn On/Off Fee	$ 200	$ 100	$ 171	$ 200
Interest Income-Fund 01,02,03	$ 6,274	$ 2,704	$ 4,636	$ 4,000
Annexation / Plan Review Fee	$ 546	$ 818	$ 1,403	$ 1,000
New Development Plan & Study Fees	$ 5,001	$ -	$ -	$ -
Total Operating Water Revenue (rounded)	**$ 371,500**	**$ 201,400**	**$ 329,800**	**$ 371,500**

[1]Calculated by multiplying the revenue through 6/30/2020 by (12/7) where applicable.

[2]Baseline revenues calculated base on the current user rate fees and the number of EDUs and were developed with input form District staff.

Fund 2: Capital Funds

Water Revenue Source	2020 Budget	Revenue through 6/30/2020	Anticipated 2020 Revenue[1]	Baseline Revenues[2]
Water Service Availability Fees	$ 30,000	$ 24,000	$ 41,143	$ 30,000
Water Interceptor/Line Capacity Fees	$ 7,500	$ 3,000	$ 5,143	$ 7,500
Total Capital Water Revenue (rounded)	**$ 37,500**	**$ 27,000**	**$ 46,300**	**$ 37,500**

[1]Calculated by multiplying the revenue through 6/30/2020 by (12/7) where applicable.

[2]Anticipating 5 additional EDUs based on input from District Staff.

Total District Operating and Capital Revenue (rounded)	**$ 409,000**	**$ 228,400**	**$ 376,100**	**$ 409,000**

North Lake Recreational Sewer and Water District
User Rate Study: Water Usage Rates
2020 Water Expenses Summary
Fiscal Year Dec. 1, 2019 To Nov 30, 2020

Water Capital and Operating Expenses					
Expense Category	2020 Budget	Expenses through 6/30/2020	Anticipated 2020 Expenses[1]	Baseline Expenses[2]	Baseline Comments
Admin Expenses[3]	$ 15,650	$ 5,340	$ 9,155	$ 10,000	Per District input
Auto Expenses[3]	$ 3,635	$ 2,179	$ 3,736	$ 3,700	Per District input
Miscellaneous Equipment Expense[3]	$ 10,405	$ 369	$ 634	$ 5,000	Per District input
Minor Equipment[3]	$ 398	$ 177	$ 304	$ 400	Per District input
Office Building Expenses[3]	$ 2,751	$ 1,386	$ 2,377	$ 2,500	Per District input
Board Expenses[3]	$ 1,705	$ 659	$ 1,131	$ 1,500	Per District input
Wages[3,4]	$ 87,585	$ 49,957	$ 85,641	$ 103,500	Staff wages proportioned to sewer and water based on EDUs
Payroll Taxes[3,4]	$ 8,519	$ 3,906	$ 6,697	$ 10,100	Assumes appoximately 10% of wages (based the 2020 Budget)
Employee Health Insurance[3,4]	$ 17,600	$ 14,570	$ 24,977	$ 20,800	Assumes appoximately 20% of wages (based the 2020 Budget)
Contract Labor[3]	$ 10,788	$ 2,562	$ 4,393	$ 12,700	Per District input
Professional Services[3]	$ 10,457	$ 4,253	$ 7,291	$ 10,000	Per District input
Engineering Services[3]	$ 227	$ 192	$ 329	$ 20,000	Per District input
Office Replacements[3]	$ 12,610	$ 2,147	$ 3,680	$ 5,000	Most of the budget is included in the replacement below
Water System Repair and Maintenance	$ 24,328	$ 4,703	$ 6,271	$ 8,000	Per District input
Tamarack Water Repair and Maintenance	$ 19,107	$ 1,083	$ 1,444	$ 8,000	Per District input
Water System Utilities	$ 10,197	$ 4,947	$ 6,596	$ 7,000	Per District input
Water System Replacements	$ 18,025	$ -	$ -	$ 188,500	From the phased water system replacement budget
Capital Purchases of Property/Equipment	$ -	$ -	$ -	$ -	Per District input
Principle Debt Payments	$ -	$ -	$ -	$ -	Per District input
Total Water System Expenses	**$ 253,987**	**$ 98,431**	**$ 164,656**	**$ 416,700**	

Water Capital and Operating Expenses Summary (rounded)				
Expense Category	2020 Budget	Expenses through 6/30/2020	Anticipated 2020 Expenses[1]	Baseline Expenses[2]
Total Operating Expenditures	$ 223,400	$ 96,284	$ 160,976	$ 223,200
Total Replacement Expenditures	$ 30,600	$ 2,147	$ 3,680	$ 193,500
Total Debt Expenditures	$ -	$ -	$ -	$ -
Total Capital Improvements	$ -	$ -	$ -	$ -
Total Water System Expenses	**$ 254,000**	**$ 98,431**	**$ 164,656**	**$ 416,700**

[1]Calculated by multiplying the revenue through 6/30/2020 by (12/7) where applicable.

[2]Baseline expenses were developed based on input from District staff with considerations for existing and historical expenses.

[3]Expenses was proportioned to the water and sewer system based on the number of EDUs services.

[4]Wages are assumed to increase by $70k in FY 2021 and FY 2022 as the District hires additional staff.

Legend
Operating and Maintenance Items
Asset Replacement Items
Debt Expenditures
Capital Improvement Expenditures

North Lake Recreational Sewer and Water District
User Rate Study: Wastewater Usage Rates
2020 Wastewater Revenues Summary
Fiscal Year Dec. 1, 2019 To Nov 30, 2020

Fund 1: Operating Funds

Wastewater Revenue Source	2020 Budget	Revenue through 6/30/2020	Anticipated 2020 Revenue[1]	Baseline Revenues[2]
Sewer Usage Revenue - Other	$ 511,776	$ 367,008	$ 629,157	$ 514,656
Sewer Usage Revenue - Donnelly	$ 57,600	$ 33,600	$ 57,600	$ 57,600
Sewer Usage Revenue - Tamarack	$ 121,824			$ 121,824
Tax Revenue - Valley County	$ 171,563	$ 129,970	$ 222,806	$ 170,000
LID Administrative Fees	$ 41,747	$ 642	$ 1,100	$ 41,747
Sewer Inspection Fees	$ 3,150	$ 2,430	$ 4,166	$ 3,000
Septage Fees	$ 50,000	$ 21,493	$ 36,844	$ 80,000
Lift Station Operating Fee	$ 1,500	$ 1,000	$ 1,714	$ 1,500
Interest Income-Fund 01,02,03	$ 21,326	$ 9,193	$ 15,759	$ 15,000
Annexation / Plan Review Fee	$ 1,854	$ 2,782	$ 4,769	$ 2,000
New Development Plan & Study Fees	$ 16,999	$ -	$ -	$ -
Total Wastewater Revenue (rounded)	**$ 999,300**	**$ 568,100**	**$ 973,900**	**$ 1,007,300**

[1]Calculated by multiplying the revenue through 6/30/2020 by (12/7) where applicable.

[2]Baseline revenues calculated based on the current user rate fees and the number of EDUs and were developed with input from District staff.

Fund 2: Capital Funds

Wastewater Revenue Source	2020 Budget	Revenue through 6/30/2020	Anticipated 2020 Revenue[1]	Baseline Revenues[2]
Sewer Service Availability Fees - General	$ 72,000	$ 84,000	$ 144,000	$ 72,000
Sewer Service Availability Fees - City of Donnelly	$ 6,000	$ -	$ -	$ 6,000
Sewer Interceptor Fees / Sewer Line Capacity Fees	$ 18,000	$ 16,500	$ 28,286	$ 18,000
Sewer Interceptor/Line Capacity Fees - City of Donnelly	$ 1,500	$ -	$ -	$ 1,500
Septage Receiving Facility	$ 85,000	$ -	$ -	$ -
Total Wastewater Revenue (rounded)	**$ 182,500**	**$ 100,500**	**$ 172,300**	**$ 97,500**

[1]Calculated by multiplying the revenue through 6/30/2020 by (12/7) where applicable.

[2]Anticipating 13 additional EDUs based on input from District staff.

Total District Operating and Capital Revenue (rounded)	**$ 1,181,800**	**$ 668,600**	**$ 1,146,200**	**$ 1,104,800**

North Lake Recreational Sewer and Water District
User Rate Study: Wastewater Usage Rates
2020 Wastewater Expenses Summary
Fiscal Year Dec. 1, 2019 To Nov 30, 2020

Wastewater Capital and Operating Expenses					
Expense Category	**2020 Budget**	**Expenses Through (6/30/2020)**	**Anticipated 2020 Expenses[1]**	**Baseline Expenses[2]**	**Baseline Comments**
Admin Expenses[3]	$ 53,197	$ 18,152	$ 31,117	$ 35,000	Per District input
Auto Expenses[3]	$ 12,355	$ 7,407	$ 12,698	$ 13,000	Per District input
Miscellaneous Equipment Expense[3]	$ 35,370	$ 1,255	$ 2,152	$ 5,000	Per District input
Minor Equipment[3]	$ 1,353	$ 602	$ 1,031	$ 1,500	Per District input
Office Building Expenses[3]	$ 9,351	$ 4,712	$ 8,078	$ 9,000	Per District input
Board Expenses[3]	$ 5,795	$ 2,241	$ 3,841	$ 5,000	Per District input
Wages[3,4]	$ 297,715	$ 169,811	$ 291,105	$ 351,800	Staff wages proportioned to sewer and water based on EDUs
Payroll Taxes[3,4]	$ 28,957	$ 13,277	$ 22,761	$ 34,200	Assumes appoximately 10% of wages (based the 2020 Budget)
Employee Health Insurance[3,4]	$ 59,825	$ 49,524	$ 84,899	$ 70,700	Assumes appoximately 20% of wages (based the 2020 Budget)
Contract Labor[3]	$ 36,672	$ 8,710	$ 14,932	$ 43,300	Per District input
Professional Services[3]	$ 35,543	$ 14,456	$ 24,782	$ 30,000	Per District input
Engineering Services[3]	$ 773	$ 653	$ 1,119	$ 40,000	Per District input
Office Replacements[3]	$ 42,865	$ 7,298	$ 12,510	$ 15,000	Most of the budget is included in the replacement below
WWTP Operation and Maintenance	$ 227,356	$ 76,956	$ 131,924	$ 125,000	Per District input
Sewer Lift Station O&M	$ 128,690	$ 51,457	$ 88,211	$ 75,000	Per District input
Sewer Collection System O&M	$ 32,410	$ 3,019	$ 5,176	$ 15,000	Per District input
Sewer System Replacements	$ 172,755	$ 123,375	$ 211,500	$ 710,400	From the phased wastewater system replacement budget
Capital Purchases of Property/Equipment	$ 175,000	$ 108	$ 184	$ -	Per District input
Principle Debt Payments	$ -	$ -	$ -	$ -	Per District input
Total Wastewater System Expenses	**$ 1,355,981**	**$ 553,012**	**$ 948,021**	**$ 1,578,900**	

Wastewater Capital and Operating Expenses Summary (rounded)				
Expense Category	**2020 Budget**	**Expenses Through (6/30/2020)**	**Anticipated 2020 Expenses[1]**	**Baseline Expenses[2]**
Total Operating Expenditures	$ 965,400	$ 422,200	$ 723,800	$ 853,500
Total Replacement Expenditures	$ 215,600	$ 130,700	$ 224,000	$ 725,400
Total Debt Expenditures	$ -	$ -	$ -	$ -
Total Capital Improvements	$ 175,000	$ 100	$ 200	$ -
Total Wastewater System Expenses	**$ 1,356,000**	**$ 553,000**	**$ 948,000**	**$ 1,578,900**

[1]Calculated by multiplying the revenue through 6/30/2020 by (12/7) where applicable.
[2]Developed based on input from District staff with considerations for existing budget and historical expenses
[3]Expenses was proportioned to the water and sewer system based on the number of EDUs services.
[4]Wages are assumed to increase by $70k in FY 2021 and FY 2022 as the District hires additional staff.

Legend
Operating and Maintenance Items
Asset Replacement Items
Debt Expenditures
Capital Improvement Expenditures

North Lake Recreational Sewer and Water District
User Rate Study: Wastewater Usage Rates
LID Summary

LID Summary			
LID	**System**	**Maturity Date**	**Billing Fee**
Mountain Meadows/West Mountain Estates	Sewer	2022	$ 490.68
Lake Cascade Ranch	Sewer	2022	$ 368.64
Wagon Wheel 6,7, & 8	Sewer	2023	$ 1,124.64
West Side Sewer	Sewer	2025	$ 12,270.84
Tamarack Phase 1 Sewer	Sewer	2024	$ 5,821.73
Tamarack Phase 2 Sewer	Sewer	2028	$ 3,058.44
Tamarack Phase 3 Sewer	Sewer	2034	$ 18,612.00
Tamarack Water	Water	2025	$ 39,102.71
Day Star Water	Water	2023	$ 924.60

Water LID Admin Fee Retirement Schedule[1]						
LID	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Tamarack Water	$ 39,103	$ 39,103	$ 39,103	$ 39,103	$ 39,103	$ 39,103
Day Star Water	$ 925	$ 925	$ 925	$ 925	$ -	$ -
Total Water LID Admin Fees	**$ 40,027**	**$ 40,027**	**$ 40,027**	**$ 40,027**	**$ 39,103**	**$ 39,103**

Sewer LID Admin Fee Retirement Schedule[1]						
LID	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Mountain Meadows/West Mountain Estates	$ 491	$ 491	$ 491	$ -	$ -	$ -
Lake Cascade Ranch	$ 369	$ 369	$ 369	$ -	$ -	$ -
Wagon Wheel 6,7, & 8	$ 1,125	$ 1,125	$ 1,125	$ 1,125	$ -	$ -
West Side Sewer	$ 12,271	$ 12,271	$ 12,271	$ 12,271	$ 12,271	$ 12,271
Tamarack Phase 1 Sewer	$ 5,822	$ 5,822	$ 5,822	$ 5,822	$ 5,822	$ -
Tamarack Phase 2 Sewer	$ 3,058	$ 3,058	$ 3,058	$ 3,058	$ 3,058	$ 3,058
Tamarack Phase 3 Sewer	$ 18,612	$ 18,612	$ 18,612	$ 18,612	$ 18,612	$ 18,612
Total Sewer LID Admin Fees	**$ 41,747**	**$ 41,747**	**$ 41,747**	**$ 40,888**	**$ 39,763**	**$ 33,941**

[1]LID payments are a pass through cost to the District and were not included in the rate analysis. However, LID administration fees were included as a source of revenue. These fees will retire as the LID retires.

ATTACHMENT C

Water and Wastewater System Replacement Budgets

KELLER ASSOCIATES

North Lake Recreational Sewer and Water District

User Rate Study: Water Replacement Budgets

Water Replacement Budget Summary

Annual Water System Replacement Budget	
Category	**Annual Replacements**
Vehicles and Equipment	$ 7,000
Pipelines[1]	$ 67,300
Fire Hydrants	$ 20,400
PRVs	$ 2,200
Water Meters	$ 10,500
Small Wells	$ 41,000
Large Wells	$ 112,000
Storage Tank	$ 5,000
Total Annual Replacement Budget (rounded)	**$ 265,400**

[1]Annual costs are calculated by estimating replacing 1% of piping per year

North Lake Recreational Sewer and Water District

User Rate Study: Water Replacement Budgets

Vehicle Replacement Budget

Vehicle Replacement Budget	
Item	**Annual Cost**
Annual Vehicle Replacement Costs	$ 30,000
Water System Vehicles	$ 7,000
Sewer System Vehicles	$ 23,000

North Lake Recreational Sewer and Water District

User Rate Study: Water Replacement Budgets

Pipeline Replacement Budgets

Water Pipe Length Summary									
Service Area	3" PVC (ft)	6" PVC (ft)	8" PVC (ft)	10" PVC (ft)	12" PVC (ft)	8" DIP (ft)	12" DIP (ft)	16" DIP (ft)	Total Pipe Length (ft)
Fir Grove		4,535		2,320	4,560				11,415
Hawks Bay			13,638						13,638
Day Star		825	12,609						13,434
Tamarack	500		15,704		19,985	430	5,283	2,378	44,280
Total Pipe Length (ft)	**500**	**5,360**	**41,951**	**2,320**	**24,545**	**430**	**5,283**	**2,378**	**82,767**
PVC = polyvinyl chloride		DIP = ductile iron pipe							

Water Pipe Replacement Budget													
Pipe	Total Length	1% of Length	Replacement Cost (per LF)	Half Lane Road Repair (per LF)	Utility Protection (per LF)	Reconnect Services (per LF)	Traffic Control Without Flagging (per LF)	Mobilization	Contingency	Engineering & CMS	Total Cost (per LF)	1% of System Cost
3" PVC	500	5	$ 23	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 53	$ 300
6" PVC	5,360	54	$ 32	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 59	$ 3,200
8" PVC	41,951	420	$ 39	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 64	$ 26,700
10" PVC	2,320	23	$ 81	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 91	$ 2,100
12" PVC	24,545	245	$ 98	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 102	$ 25,000
8" DIP	430	4	$ 75	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 87	$ 400
12" DIP	5,283	53	$ 113	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 112	$ 5,900
16" DIP	2,378	24	$ 181	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 156	$ 3,700
Annual Water Pipe Replacement Cost (rounded)												**$ 67,300**
PVC = polyvinyl chloride		DIP = ductile iron pipe										

North Lake Recreational Sewer and Water District

User Rate Study: Water Replacement Budgets

Fire Hydrant Replacement Budget

Fire Hydrant Replacement Budget	
Service Area	**# Hydrants**
Day Star	30
Hawks Bay	20
Fir Grove	32
Tamarack	81
Total Number of Hydrants	163
Typical Life (yrs)	50
Hydrants replaced per year	4
Typical cost/Hydrants	$ 5,100
Annual Hydant Replacement Budget (Rounded)	**$ 20,400**

North Lake Recreational Sewer and Water District
User Rate Study: Water Replacement Budgets
Pressure Reducing Valve Replacement Budget

PRV Replacement Budget			
Item	**Quantity**	**Unit Cost**	**Total Cost**
3" PRV	1	$ 3,000	$ 3,000
4" PRV	3	$ 4,500	$ 13,500
6" PRV	1	$ 5,500	$ 5,500
10" PRV	3	$ 7,000	$ 21,000
		Total Cost	*$ 43,000*
		Typical PRV Life (yrs)	*20*
Total Annual Replacement Cost (rounded)			**$ 2,200**

North Lake Recreational Sewer and Water District

User Rate Study: Water Replacement Budgets

Water Meter Replacement Budget

Water Meter Replacement Budget	
Service Area	**# Meters**
Day Star	151
Hawks Bay	139
Fir Grove	121
Tamarack	286
Total Number of Meters	697
Typical Life (yrs)	20
Meters replaced per year	35
Typical cost/meter	$ 300
Annual Meter Replacement Budget (Rounded)	**$ 10,500**

North Lake Recreational Sewer and Water District

User Rate Study: Water Replacement Budgets

Small Well Replacement Budget

Small Well Summary				
Well	**Service Area**	**Pumps (hp)**	**Capacity (gpm)**	**CS or VFD[1]**
Well 1	Day Star	10	150	VFD
Well 2	Day Star	25	450	VFD
Well 1	Hawks Bay	unk	200	VFD

[1]CS: Constant Speed; VFD: Variable Frequency Drive

Small Well Replacement Budget			
Typical Replacement Activities	**Frequency (years)**	**Unit Cost**	**Cost/year**
Electrical	20	$ 45,000	$ 2,300
Pump and motor	15	$ 60,000	$ 4,000
SCADA	15	$ 21,000	$ 1,400
Building	40	$ 80,000	$ 2,000
Site	30	$ 20,000	$ 700
Chlorination / treatment	20	$ 15,000	$ 800
Valves / meter /piping	30	$ 30,000	$ 1,000
Well Hole Rehabilitation	15	$ 20,000	$ 1,300
		Total per Facility	*$ 13,500*
		# Wells On line	*3*
Recommended Annual Budget (rounded)			**$ 41,000**

North Lake Recreational Sewer and Water District

User Rate Study: Water Replacement Budgets

Large Well Replacement Budget

Large Well Summary				
Well	Service Area	Pumps (hp)	Capacity (gpm)	CS or VFD[1]
Well 4	Tamarack	125	500	CS
Well 7	Tamarack	175	700	CS
Well 1	Fir Grove	unk	1000	VFD
Well 2	Fir Grove	unk	800	VFD
Well 2	Hawks Bay	unk	800	VFD

[1]CS: Constant Speed; VFD: Variable Frequency Drive

Large Well Replacement Budget			
Typical Replacement Activities	Frequency (years)	Unit Cost	Cost/year
Electrical/Generator	20	$ 85,000	$ 4,300
Pump and motor	15	$ 100,000	$ 6,700
SCADA	15	$ 28,000	$ 1,900
Building	40	$ 120,000	$ 3,000
Site	30	$ 35,000	$ 1,200
Chlorination / treatment	20	$ 35,000	$ 1,800
Valves / meter /piping	30	$ 50,000	$ 1,700
Well Hole Rehabilitation	15	$ 25,000	$ 1,700
		Total per Facility	*$ 22,300*
		# Wells On line	*5*
Recommended Annual Budget (rounded)			**$ 112,000**

North Lake Recreational Sewer and Water District

User Rate Study: Water Replacement Budgets

Water Storage Tank Replacement Budget

Water Storage Tank Summary			
Tank	**Service Area**	**Size (MG)**	**Type**
North Reservoir	Tamarack	1.25	Concrete

Water Storage Tank Replacement Budget			
Typical Replacement Activities	**Frequency (years)**	**Unit Cost**	**Cost/year**
New Hatch	25	$ 12,000	$ 500
New Vent	25	$ 10,000	$ 400
New Ladder	25	$ 20,000	$ 800
Site	30	$ 20,000	$ 700
Inspection	7	$ 6,000	$ 900
Clean	7	$ 12,000	$ 1,700
Recommended Annual Budget (rounded)			**$ 5,000**

North Lake Recreational Sewer and Water District

User Rate Study: Sewer Replacement Budgets

Sewer Replacement Budget Summary

Annual Sewer System Replacement Budget		
Category	**Annual Replacements**	
Vehicles and Equipment	$	23,000
Gravity Sewer Pipelines[1]	$	367,600
Pressure Sewer Pipelines[1]	$	302,800
Manholes	$	55,500
Collection System Piping Subtotal	*$*	*748,900*
Small Lift Stations	$	165,000
Medium Lift Stations	$	74,000
WWTP	$	387,900
Lift Station and WWTP Subtotal	*$*	*626,900*
Total Annual Replacement Budget	**$**	**1,375,800**

[1]Annual costs are calculated by estimating replacing 1% of the total sewer piping per year

North Lake Recreational Sewer and Water District

User Rate Study: Sewer Replacement Budgets

Vehicle Replacement Budget

Vehicle Replacement Budget	
Item	**Annual Cost**
Annual Vehicle Replacement Costs	$ 30,000
Water System Vehicles	$ 7,000
Sewer System Vehicles	$ 23,000

North Lake Recreational Sewer and Water District

User Rate Study: Sewer Replacement Budgets

Pipeline Replacement Budgets

Gravity Sewer												
Pipe Diameter (in)	Total Length (ft)	1% of Length (ft)	Replacement Cost (per LF)	Half Lane Road Repair (per LF)	Utility Protection (per LF)	Reconnect Services (per LF)	Traffic Control Without Flagging (per LF)	Mobilization	Contingency	Engineering & CMS	Total Cost (per LF)	1% of System Cost
8	145,339	1454	$ 73	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 224	$ 326,400
10	17,611	177	$ 78	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 233	$ 41,200
Annual Gravity Sewer Pipe Replacement Cost (rounded)												**$ 367,600**

Raw Pressure Sewer												
Pipe Diameter (in)	Total Length (ft)	1% of Length (ft)	Replacement Cost (per LF)	Half Lane Road Repair (per LF)	Utility Protection (per LF)	Reconnect Services (per LF)	Traffic Control Without Flagging (per LF)	Mobilization	Contingency	Engineering & CMS	Total Cost (per LF)	1% of System Cost
4	21,750	218	$ 31	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 156	$ 33,900
6	73,540	735	$ 42	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 173	$ 127,300
8	25,200	252	$ 52	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 190	$ 47,900
10	27,300	273	$ 62	$ 26	$ 4	$ 29	$ 4	10%	35%	20%	$ 207	$ 56,600
Annual Pressure Sewer Pipe Replacement Cost (rounded)												**$ 265,700**

WWTP Effluent Pressure Sewer											
Pipe Diameter (in)	Total Length (ft)	1% of Length (ft)	Replacement Cost (per LF)	Half Lane Road Repair (per LF)	Utility Protection (per LF)	Traffic Control Without Flagging (per LF)	Mobilization	Contingency	Engineering & CMS	Total Cost (per LF)	1% of System Cost
8	160	2	$ 52	$ 26	$ 4	$ 4	10%	35%	20%	$ 142	$ 200
12	16	0	$ 73	$ 26	$ 4	$ 4	10%	35%	20%	$ 176	$ -
14	17,503	175	$ 93	$ 26	$ 4	$ 4	10%	35%	20%	$ 211	$ 36,900
Annual WWTP Effluent Pressure Sewer Pipe Replacement Cost (rounded)											**$ 37,100**

Manhole Rehabilitation Budget				
Total Manholes	Manholes Rehab Annually	Manhole Rehab (each)	Annual Rehab Budget	% Cost from Tamarack
711	15	$ 3,700	$ 55,500	$ 13,270.04

North Lake Recreational Sewer and Water District

User Rate Study: Sewer Replacement Budgets

Small Lift Station Replacement Budgets

Small Lift Station Summary (< 400 gpm pumping capacity)				
Lift Station	**Service Area**	**Pumps**	**Firm Capacity[1]**	**Generator?**
P-1	Hillhouse	3.7 hp (80 gpm) 3.7 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-3	Edwards	3.7 hp (80 gpm) 3.7 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-5	Big Smoky	3.7 hp (80 gpm) 3.7 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-7	Wagon Wheel	5.4 hp (330 gpm) 5.4 hp (330 gpm)	330 gpm	No, quick connect for portable generator
P-8	Wagon Wheel	3.7 hp (80 gpm) 3.7 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-9	Day Star	3.7 hp (80 gpm) 3.7 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-10	Day Star	3.7 hp (80 gpm) 3.7 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-11	Day Star	3.7 hp (80 gpm) 3.7 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-12	Day Star	6 hp (180 gpm) 6 hp (180 gpm)	180 gpm	No, quick connect for portable generator
P-13	Edwards	3.7 hp (80 gpm) 3.7 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-14	Hillhouse	6.2 hp (80 gpm) 6.2 hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-15	Edwards	unk hp (80 gpm) unk hp (80 gpm)	80 gpm	No, quick connect for portable generator
P-16	Wagon Wheel	unk hp (80 gpm) unk hp (80 gpm)	80 gpm	No, quick connect for portable generator
Discovery Drive	Tamarack	unk hp (80 gpm) unk hp (80 gpm)	80 gpm	No, quick connect for portable generator
Hawks Bay	Hawks Bay	unk hp (80 gpm) unk hp (80 gpm)	80 gpm	No, quick connect for portable generator
Fir Grove	Fir Grove	unk hp (120 gpm) unk hp (120 gpm)	120 gpm	No, quick connect for portable generator

[1]Largest pump offline

Small Lift Station Replacement Budget			
Typical Replacement Activities	**Frequency (years)**	**Unit Cost**	**Cost/year**
Electrical	20	$ 32,000	$ 1,600
Pump and motor	15	$ 42,000	$ 2,800
SCADA	15	$ 15,000	$ 1,000
Site	30	$ 10,000	$ 400
Instrumentation	15	$ 9,000	$ 600
Odor control	15	$ 10,000	$ 700
Wet Well (rehab)	20	$ 37,000	$ 1,900
Building / structure	40	$ 32,000	$ 800
Valves / meter	30	$ 15,000	$ 500
		Total per Facility	*$ 10,300*
		# Pump Stations	*16*
Recommended Annual Budget (rounded)			**$ 165,000**

North Lake Recreational Sewer and Water District

User Rate Study: Sewer Replacement Budgets

Medium Lift Station Replacement Budgets

Medium Lift Station (> 400 gpm pumping capacity)				
Lift Station	**Service Area**	**Pumps**	**Firm Capacity[1]**	**Generator?**
P-2	Edwards	47 hp (320 gpm) 47 hp (320 gpm)	320 gpm	No, quick connect for portable generator
P-4	Big Smoky	58 hp (500 gpm) 58 hp (500 gpm)	500 gpm	No, quick connect for portable generator
P-6	Wagon Wheel	9.4 hp (440 gpm) 9.4 hp (440 gpm)	440 gpm	No, quick connect for portable generator
Poison Creek	Tamarack	unk hp (575 gpm) unk hp (575 gpm)	575 gpm	Yes

[1]Largest pump offline

Medium Lift Station Replacement Budget			
Typical Replacement Activities	**Frequency (years)**	**Unit Cost**	**Cost/year**
Electrical	20	$ 32,000	$ 1,600
Generator	30	$ 75,000	$ 2,500
Pump and motor	15	$ 73,000	$ 4,900
SCADA	12	$ 21,000	$ 1,800
Site	30	$ 10,000	$ 400
Instrumentation	15	$ 9,000	$ 600
Odor control	15	$ 16,000	$ 1,100
Wet Well (rehab)	20	$ 52,000	$ 2,600
Building / structure	40	$ 68,000	$ 1,700
Valves / meter	30	$ 40,000	$ 1,400
		Total per Facility	*$ 18,600*
		# Pump Stations	*4*
Recommended Annual Budget (rounded)			**$ 74,000**

North Lake Recreational Sewer and Water District

User Rate Study: Sewer Replacement Budgets

Wastewater Treatment Plant Replacement Budgets

WWTP Short Lived Assets Summary and Costs					
Equipment Description	**Replacement Items**	**Unit Cost**	**Units**	**Life (Yr)**	**Annual Cost**
Headworks	8" Magnetic Flow Meter	$ 3,400	2	20	$ 340
	12" Magnetic Flow Meter	$ 5,200	2	20	$ 520
	Drum Screen	$ 173,000	2	20	$ 17,300
	Screening Washer/Compactor	$ 56,000	1	20	$ 2,800
	Odor Control Equipment	$ 103,200	1	15	$ 6,880
	HVAC	$ 110,600	1	15	$ 7,373
Aeration Basins	Diffusers	$ 30,000	1	10	$ 3,000
	Submersible Mixers	$ 25,000	4	7	$ 14,286
	Sensors	$ 7,400	4	10	$ 2,960
MBR System	Membranes and Accessories	$ 300,000	4	10	$ 120,000
	Membrane Blowers	$ 250,300	3	20	$ 37,545
	Process Blowers	$ 250,300	3	20	$ 37,545
	Chemical Tanks (2,500 gal)	$ 7,400	3	30	$ 740
	Air Compressor	$ 7,400	2	15	$ 987
	Turbidity Meters	$ 4,500	2	6	$ 1,500
	Hydropneumatic Tank	$ 7,400	2	30	$ 493
	Sodium Hypochlorite Pump	$ 7,400	1	15	$ 493
	Citric Acid Pump	$ 7,400	1	15	$ 493
	Sodium Hydroxide Pump	$ 7,400	1	15	$ 493
	Alum Pump	$ 7,400	1	15	$ 493
	Utility Water Pump	$ 22,200	1	20	$ 1,110
	Permeate Pump	$ 67,800	4	20	$ 13,560
	RAS Pump	$ 67,800	4	20	$ 13,560
	WAS Pumps	$ 25,000	2	20	$ 2,500
	Scum Pumps	$ 29,500	1	15	$ 1,967
	Drain Pump	$ 29,500	1	15	$ 1,967
	HVAC	$ 110,600	1	15	$ 7,373
UV System	Lamp Replacement	$ 200	128	1.5	$ 17,067
	Ballast and Enclosures	$ 108,200	4	15	$ 28,853
	UV Sensors	$ 4,500	4	10	$ 1,800
Electrical/SCADA	PLC / Instrumentation	$ 110,600	1	15	$ 7,373
Lagoons	Blowers (15 and 25 hp)	$ 50,000	2	20	$ 5,000
	Effluent Pumps	$ 100,000	2	20	$ 10,000
Clorination	Gas Chlorinator (Regal Model 216)	$ 30,000	1	20	$ 1,500
	Chlorine Detector (FX 1502)	$ 1,300	1	10	$ 130
	Portable Air Pack	$ 3,000	1	20	$ 150
Irrigation System	Aurora 530 Submersible Pumps	$ 20,000	2	20	$ 2,000
	4" Risers	$ 210	42	20	$ 441
	6" Risers	$ 230	15	20	$ 173
	40-ft Wheel Line Sections	$ 500	70	20	$ 1,750
	Wheel Line Mover	$ 5,000	3	20	$ 750
	20ft Handline Sections	$ 100	3	20	$ 15
	40ft Handline Sections	$ 180	38	20	$ 342
Miscellaneous Equipment	Bridge Crane	$ 88,500	1	20	$ 4,425
	Generator	$ 191,600	1	30	$ 6,387
	Composite Samplers	$ 10,900	2	15	$ 1,453
				Total Annual Cost for Existing Short-Lived Assets (rounded)	**$ 387,900**

North Lake Recreational Sewer and Water District

User Rate Study: Sewer Replacement Budgets

Unit Prices

Unit Prices		
ITEM	UNIT	UNIT PRICE
PVC Pipe (Gravity)		
8-inch Pipe - Excavation, Backfill	LF	$73
10-inch Pipe - Excavation, Backfill	LF	$78
PVC Pipe (Pressure)		
4-inch Pressure Pipe - Excavation, Backfill	LF	$31
6-inch Pressure Pipe - Excavation, Backfill	LF	$42
8-inch Pressure Pipe - Excavation, Backfill	LF	$52
10-inch Pressure Pipe - Excavation, Backfill	LF	$62
12-inch Pressure Pipe - Excavation, Backfill	LF	$73
14-inch Pressure Pipe - Excavation, Backfill	LF	$93
Manhole Rehabilitation	EA	$3,700
Existing Utility Protection	LF	$4
Reconnect Services	LF	$29
Traffic Control - Without Flagging	LF	$4
Traffic Control - With Flagging	LF	$8
Full Lane Pavement Repair	LF	$47
Half Lane Pavement Repair	LF	$26
Gravel Repair	LF	$10
Miscellaneous Surface Repair	LF	$3
Mobilization - Percent of Item Cost Sum	%	10%
Contingency - % of construction costs	%	35%
Engineering and CMS - % of construction costs	%	20%

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

ATTACHMENT D

Water and Wastewater Rate Models

North Lake Recreational Sewer and Water District

User Rate Study: Water Usage Rates

1-Year Water Rate Model

	Budget FY 2020	Forecast FY 2021	Forecast FY 2022	Forecast FY 2023	Forecast FY 2024	Forecast FY 2025
User Rate % Annual Increase		**26% - 42%**	**5.0%**	**5.0%**	**5.0%**	**5.0%**
Non-Tamarack Water Usage Fee per EDU	**$ 24.00**	**$ 34.00**	**$ 35.70**	**$ 37.50**	**$ 39.40**	**$ 41.40**
Tamarack Water Usage Fee per EDU	**$ 38.00**	**$ 48.00**	**$ 49.70**	**$ 51.50**	**$ 53.40**	**$ 55.40**
Non-Tamarack EDUs	**286**	**291**	**296**	**301**	**306**	**311**
Tamarack EDUs	**423**	**423**	**423**	**423**	**423**	**423**
Operating Revenues						
Non-Tamarack Usage Fee	$ 86,400	$ 118,700	$ 126,800	$ 135,500	$ 144,700	$ 154,500
Tamarack Usage Fee	$ 181,400	$ 243,600	$ 252,300	$ 261,400	$ 271,100	$ 281,200
Other Charges [1]	$ 63,600	$ 56,200	$ 59,000	$ 62,000	$ 65,100	$ 68,400
LID Billing Revenue[2]	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 39,100	$ 39,100
Total Operating Revenues	**$ 371,400**	**$ 458,500**	**$ 478,100**	**$ 498,900**	**$ 520,000**	**$ 543,200**
Operating Expenditures						
Operations[3]	$ 223,400	$ 229,900	$ 236,800	$ 243,900	$ 251,200	$ 258,700
Replacements[3,4,5]	$ 30,600	$ 194,200	$ 211,400	$ 229,700	$ 248,700	$ 268,600
Debt Payments[6]	$ -	$ -	$ -	$ -	$ -	$ -
Total Operating Expenditures	**$ 254,000**	**$ 424,100**	**$ 448,200**	**$ 473,600**	**$ 499,900**	**$ 527,300**
Capital Revenues						
Water Service Availability Fee[7]	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Water Interceptor/Line Capacity Fee[7]	$ 7,500	$ 7,500	$ 7,500	$ 7,500	$ 7,500	$ 7,500
Total Capital Revenues	**$ 37,500**	**$ 37,500**	**$ 37,500**	**$ 37,500**	**$ 37,500**	**$ 37,500**
Capital Expenditures						
Capital Improvements[8]	$ -	$ 584,000	$ -	$ -	$ -	$ -
Total Capital Expenditures	**$ -**	**$ 584,000**	**$ -**	**$ -**	**$ -**	**$ -**
Account Balances						
Total Initial Funds[9]	$ 1,204,200	$ 1,359,100	$ 847,000	$ 914,400	$ 977,200	$ 1,034,800
Net Operating Revenue[10]	$ 117,400	$ 34,400	$ 29,900	$ 25,300	$ 20,100	$ 15,900
Net Capital Revenue[11]	$ 37,500	$ (546,500)	$ 37,500	$ 37,500	$ 37,500	$ 37,500
Ending Account Balance	**$ 1,359,100**	**$ 847,000**	**$ 914,400**	**$ 977,200**	**$ 1,034,800**	**$ 1,088,200**

Notes:

1. Other charges include: Tax Revenue for Valley County, Water Inspection Fees, Water Turn on/off fees, Interest Income, Annexation/Plan Review Fees, and New Development Plan and Study Fees.
2. Billing fees for the Day Star Water and Tamarack Water LIDs.
3. 3.0% annual inflation of costs is assumed.
4. Replacement costs include: vehicles and equipment, pipelines, fire hydrants, PRVs, water meters, wells, and the storage tank.
5. Pipeline and manhole replacements are 10% funding in FY 2021. Funding increases by 10% each year until the pipeline and manhole replacements are fully funded in in FY 2030. All other items are fully funded in FY 2021.
6. The District currently only has LID debt payments. These payments are made by the customers and are directly passed from the District to the LID holders. These payments are not included in this estimate.
7. Revenue estimated based on 5 new EDUs per year
8. FY 2021 capital improvements include a system master plan, GIS mapping, and updating/replacing the Tamarack SCADA system.
9. FY 2020 initial fund from the 2019 Audit.
10. Total operating revenues minus total operating expenditures.
11. Total capital revenues minus total capital expenditures.

North Lake Recreational Sewer and Water District
User Rate Study: Water Usage Rates
2-Year Water Rate Model

	Budget FY 2020	Forecast FY 2021	Forecast FY 2022	Forecast FY 2023	Forecast FY 2024	Forecast FY 2025
User Rate % Annual Increase		**16% - 25%**	**14% - 20%**	**5.0%**	**5.0%**	**5.0%**
Non-Tamarack Water Usage Fee per EDU	**$ 24.00**	**$ 30.00**	**$ 36.00**	**$ 37.80**	**$ 39.70**	**$ 41.70**
Tamarack Water Usage Fee per EDU	**$ 38.00**	**$ 44.00**	**$ 50.00**	**$ 51.80**	**$ 53.70**	**$ 55.70**
Non-Tamarack EDUs	**286**	**291**	**296**	**301**	**306**	**311**
Tamarack EDUs	**423**	**423**	**423**	**423**	**423**	**423**
Operating Revenues						
Non-Tamarack Usage Fee	$ 86,400	$ 104,800	$ 127,900	$ 136,500	$ 145,800	$ 155,600
Tamarack Usage Fee	$ 181,400	$ 223,300	$ 253,800	$ 262,900	$ 272,600	$ 282,700
Other Charges [1]	$ 63,600	$ 56,200	$ 59,000	$ 62,000	$ 65,100	$ 68,400
LID Billing Revenue[2]	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 39,100	$ 39,100
Total Operating Revenues	**$ 371,400**	**$ 424,300**	**$ 480,700**	**$ 501,400**	**$ 522,600**	**$ 545,800**
Operating Expenditures						
Operations[3]	$ 223,400	$ 229,900	$ 236,800	$ 243,900	$ 251,200	$ 258,700
Replacements[3,4,5]	$ 30,600	$ 194,200	$ 211,400	$ 229,700	$ 248,700	$ 268,600
Debt Payments[6]	$ -	$ -	$ -	$ -	$ -	$ -
Total Operating Expenditures	**$ 254,000**	**$ 424,100**	**$ 448,200**	**$ 473,600**	**$ 499,900**	**$ 527,300**
Capital Revenues						
Water Service Availability Fee[7]	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Water Interceptor/Line Capacity Fee[7]	$ 7,500	$ 7,500	$ 7,500	$ 7,500	$ 7,500	$ 7,500
Total Capital Revenues	**$ 37,500**	**$ 37,500**	**$ 37,500**	**$ 37,500**	**$ 37,500**	**$ 37,500**
Capital Expenditures						
Capital Improvements[8]	$ -	$ 584,000	$ -	$ -	$ -	$ -
Total Capital Expenditures	**$ -**	**$ 584,000**	**$ -**	**$ -**	**$ -**	**$ -**
Account Balances						
Total Initial Funds[9]	$ 1,204,200	$ 1,359,100	$ 812,800	$ 882,800	$ 948,100	$ 1,008,300
Net Operating Revenue[10]	$ 117,400	$ 200	$ 32,500	$ 27,800	$ 22,700	$ 18,500
Net Capital Revenue[11]	$ 37,500	$ (546,500)	$ 37,500	$ 37,500	$ 37,500	$ 37,500
Ending Account Balance	**$ 1,359,100**	**$ 812,800**	**$ 882,800**	**$ 948,100**	**$ 1,008,300**	**$ 1,064,300**

Notes:

1. Other charges include: Tax Revenue for Valley County, Water Inspection Fees, Water Turn on/off fees, Interest Income, Annexation/Plan Review Fees, and New Development Plan and Study Fees.
2. Billing fees for the Day Star Water and Tamarack Water LIDs.
3. 3.0% annual inflation of costs is assumed.
4. Replacement costs include: vehicles and equipment, pipelines, fire hydrants, PRVs, water meters, wells, and the storage tank.
5. Pipeline and manhole replacements are 10% funding in FY 2021. Funding increases by 10% each year until the pipeline and manhole replacements are fully funded in in FY 2030. All other items are fully funded in FY 2021.
6. The District currently only has LID debt payments. These payments are made by the customers and are directly passed from the District to the LID holders. These payments are not included in this estimate.
7. Revenue estimated based on 5 new EDUs per year
8. FY 2021 capital improvements include a system master plan, GIS mapping, and updating/replacing the Tamarack SCADA system.
9. FY 2020 initial fund from the 2019 Audit.
10. Total operating revenues minus total operating expenditures.
11. Total capital revenues minus total capital expenditures.

North Lake Recreational Sewer and Water District
User Rate Study: Wastewater Usage Rates
1-Year Wastewater Rate Model

	Budget FY 2020	Forecast FY 2021	Forecast FY 2022	Forecast FY 2023	Forecast FY 2024	Forecast FY 2025
User Rate % Annual Increase		**100.0%**	**5.0%**	**5.0%**	**5.0%**	**5.0%**
Wastewater Rate per EDU	**$ 24.00**	**$ 48.00**	**$ 50.40**	**$ 53.00**	**$ 55.70**	**$ 58.50**
Number of EDUs[1]	**2410**	**2423**	**2436**	**2449**	**2462**	**2475**
Operating Revenues						
Sewer Usage Fee	$ 691,200	$ 1,395,600	$ 1,473,300	$ 1,557,600	$ 1,645,600	$ 1,737,500
Septage Fees	$ 50,000	$ 80,000	$ 84,000	$ 88,200	$ 92,600	$ 97,200
Other Charges [2]	$ 216,400	$ 191,500	$ 201,100	$ 211,200	$ 221,800	$ 232,900
LID Billing Revenue[3]	$ 41,700	$ 41,700	$ 41,700	$ 40,900	$ 39,800	$ 33,900
Total Operating Revenues	**$ 999,300**	**$ 1,708,800**	**$ 1,800,100**	**$ 1,897,900**	**$ 1,999,800**	**$ 2,101,500**
Operating Expenditures						
Operations[4]	$ 965,400	$ 879,100	$ 905,500	$ 932,700	$ 960,700	$ 989,500
Replacements[5,6]	$ 215,600	$ 731,800	$ 817,700	$ 908,500	$ 1,003,800	$ 1,104,200
Total Operating Expenditures	**$ 1,181,000**	**$ 1,610,900**	**$ 1,723,200**	**$ 1,841,200**	**$ 1,964,500**	**$ 2,093,700**
Capital Revenues						
Sewer Service Availability Fees - General[7]	$ 72,000	$ 72,000	$ 72,000	$ 72,000	$ 72,000	$ 72,000
Sewer Service Availability Fees - City of Donnelly[8]	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000
Sewer Interceptor Fees / Sewer Line Capacity Fees[7]	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000
Sewer Interceptor/Line Capacity Fees - City of Donnelly[8]	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500
Septage Receiving Facility[9]	$ 85,000	$ -	$ -	$ -	$ -	$ -
Total Capital Revenues	**$ 182,500**	**$ 97,500**	**$ 97,500**	**$ 97,500**	**$ 97,500**	**$ 97,500**
Capital Expenditures						
Capital Improvements	$ 175,000	$ 699,400	$ 1,311,300	$ 327,800	$ -	$ -
Debt Payments[10,11]	$ -	$ -	$ -	$ 135,300	$ 135,300	$ 135,300
Total Capital Expenditures	**$ 175,000**	**$ 699,400**	**$ 1,311,300**	**$ 463,100**	**$ 135,300**	**$ 135,300**
Account Balances						
Total Initial Funds[12]	$ 4,093,100	$ 3,918,900	$ 3,414,900	$ 2,278,000	$ 1,969,100	$ 1,966,600
Net Operating Revenue[13]	$ (181,700)	$ 97,900	$ 76,900	$ 56,700	$ 35,300	$ 7,800
Net Capital Revenue[14]	$ 7,500	$ (601,900)	$ (1,213,800)	$ (365,600)	$ (37,800)	$ (37,800)
Ending Account Balance	**$ 3,918,900**	**$ 3,414,900**	**$ 2,278,000**	**$ 1,969,100**	**$ 1,966,600**	**$ 1,936,600**

Notes:

1. A growth of 13 EDUs per year is estimated.
2. Other charges include: Tax Revenue for Valley County, Sewer Inspection Fees, Lift Station Operating Fee, Interest Income, Annexation/Plan Review Fees, and New Development Plan & Study Fees.
3. Billing fees for the Mountain Meadow, Lake Cascade Ranch, Wagon Wheel 6, 7, and 8, West Side Sewer, and Tamarack Sewer Phases 1, 2, and 3.
4. 3.0% annual inflation of costs are assumed.
5. Replacement costs include: vehicles and equipment, gravity pipelines, pressure pipelines, manholes, lift stations, and the WWTP.
6. Pipeline and manhole replacements are 10% funding in FY 2021. Funding increases by 10% each year until the pipeline and manhole replacements are fully funded in in FY 2030. All other replacement items are fully funded in FY 2021
7. Revenue estimated based on 12 new EDUs per year
8. Revenue estimated based on 1 new EDU per year
9. The septage receiving revenue was a grant that the District received in 2020. No additional funds from the grant will be awarded in future years.
10. The District currently only has LID debt payments. These payments are made by the customers and are directly passed from the District to the LID holders. These payments are not included in this estimate.
11. The debt payments shown are estimated from financing the construction of the future solids handling facility with a 20 year, 3.5% interest loan.
12. Initial fund balance as shown in the 2019 Audit.
13. Total operating revenues minus total operating expenditures.
14. Total capital revenues minus total capital expenditures.

North Lake Recreational Sewer and Water District

User Rate Study: Sewer Usage Rates

2-Year Wastewater Rate Model

	Budget FY 2020	Forecast FY 2021	Forecast FY 2022	Forecast FY 2023	Forecast FY 2024	Forecast FY 2025
User Rate % Annual Increase		**54.2%**	**50.0%**	**5.0%**	**5.0%**	**5.0%**
Wastewater Rate per EDU	**$ 24.00**	**$ 37.00**	**$ 50.00**	**$ 52.50**	**$ 55.20**	**$ 58.00**
Number of EDUs[1]	**2410**	**2423**	**2436**	**2449**	**2462**	**2475**
Operating Revenues						
Sewer Usage Fee	$ 691,200	$ 1,075,800	$ 1,461,600	$ 1,542,900	$ 1,630,800	$ 1,722,600
Septage Fees	$ 50,000	$ 80,000	$ 84,000	$ 88,200	$ 92,600	$ 97,200
Other Charges [2]	$ 216,400	$ 191,500	$ 201,100	$ 211,200	$ 221,800	$ 232,900
LID Billing Revenue[3]	$ 41,700	$ 41,700	$ 41,700	$ 40,900	$ 39,800	$ 33,900
Total Operating Revenues	**$ 999,300**	**$ 1,389,000**	**$ 1,788,400**	**$ 1,883,200**	**$ 1,985,000**	**$ 2,086,600**
Operating Expenditures						
Operations[4]	$ 965,400	$ 879,100	$ 905,500	$ 932,700	$ 960,700	$ 989,500
Replacements[5,6]	$ 215,600	$ 731,800	$ 817,700	$ 908,500	$ 1,003,800	$ 1,104,200
Total Operating Expenditures	**$ 1,181,000**	**$ 1,610,900**	**$ 1,723,200**	**$ 1,841,200**	**$ 1,964,500**	**$ 2,093,700**
Capital Revenues						
Sewer Service Availability Fees - General[7]	$ 72,000	$ 72,000	$ 72,000	$ 72,000	$ 72,000	$ 72,000
Sewer Service Availability Fees - City of Donnelly[8]	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000
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Sewer Interceptor/Line Capacity Fees - City of Donnelly[8]	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500
Septage Receiving Facility[9]	$ 85,000	$ -	$ -	$ -	$ -	$ -
Total Capital Revenues	**$ 182,500**	**$ 97,500**	**$ 97,500**	**$ 97,500**	**$ 97,500**	**$ 97,500**
Capital Expenditures						
Capital Improvements	$ 175,000	$ 699,400	$ 1,311,300	$ 327,800	$ -	$ -
Debt Payments[10,11]	$ -	$ -	$ -	$ 135,300	$ 135,300	$ 135,300
Total Capital Expenditures	**$ 175,000**	**$ 699,400**	**$ 1,311,300**	**$ 463,100**	**$ 135,300**	**$ 135,300**
Account Balances						
Total Initial Funds[12]	$ 4,093,100	$ 3,918,900	$ 3,095,100	$ 1,946,500	$ 1,622,900	$ 1,605,600
Net Operating Revenue[13]	$ (181,700)	$ (221,900)	$ 65,200	$ 42,000	$ 20,500	$ (7,100)
Net Capital Revenue[14]	$ 7,500	$ (601,900)	$ (1,213,800)	$ (365,600)	$ (37,800)	$ (37,800)
Ending Account Balance	**$ 3,918,900**	**$ 3,095,100**	**$ 1,946,500**	**$ 1,622,900**	**$ 1,605,600**	**$ 1,560,700**

Notes:

1. A growth of 13 EDUs per year is estimated.
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