CITY OF JULIAETTA

WASTEWATER FACILITY PLAN

July 23, 2020

GROWING POSSIBILITIES ▶

KELLER ASSOCIATES

JULY 2020

CITY OF
JULIAETTA, IDAHO

Wastewater Facility Plan

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CHAPTER 1 PROJECT PLANNING

1.1 Location

The Smith & Loveless package wastewater treatment plant (WWTP) in City of Juliaetta (the City) is over 40 years old with few updates since it was constructed in 1977. Treatment processes include an influent and plant drain lift station, grit tank, bar screen, comminutor, aeration tank, clarifier, microscreen, chlorination, and sludge drying beds.

Figure 1.1.1 shows the general vicinity for Juliaetta in Latah County, Idaho, as well as the WWTP's location within Juliaetta.

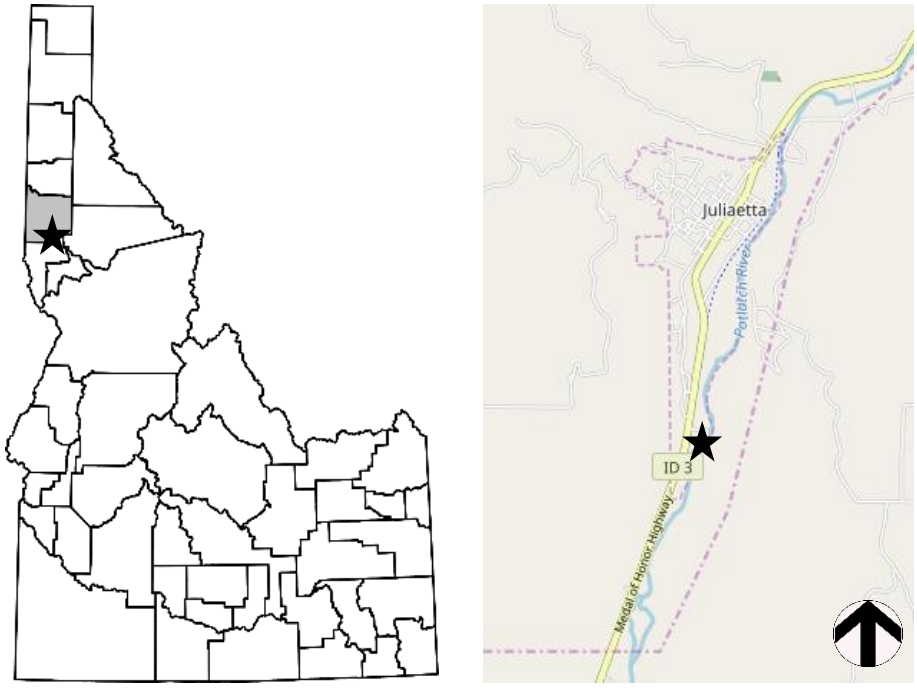


Figure 1.1.1 – Vicinity Map

The City of Juliaetta is located in the southern part of Latah County, on the east side of the Idaho panhandle. The City is situated on Highway 3, approximately 2 miles north of the Nez Perce Indian Reservation and 15.5 miles south of Troy. Specifically, Juliaetta is located in Township 37 North, Range 3 West, Latah County, Boise Meridian. The heart of the City sits on the border of Section 3 and 4 and the southern tail of the city limits extends into Sections 9 and 10.

The City's WWTP is located in the southern end of the City, at coordinates 46°33'45.8" North and 116°42'37.7" West.

1.1.1 A Brief History

The area now known as Juliaetta was founded in 1878 under the name of Schupferville, after early homesteader Rupert Schupfer. Meanwhile, Charles Snyder, a pioneer rancher, named the local post office "Juliaetta" in honor of his two daughters, Julia and Etta. The town was renamed "Juliaetta" when Snyder moved to the City's present-day location. The City of Juliaetta was incorporated on April 19, 1892

and by 1903 the population of the City had grown to 500 people. Today, State Highway 3 and the parallel Potlatch River run along the border of the City.

Juliaetta has a complimentary relationship with the neighboring city of Kendrick, located approximately six miles north on Highway 3, and the two cities share a Joint Comprehensive Plan. The North Pacific Railroad that connected the cities in the late 19th century is no longer in use and has been repurposed into a walking/biking/hiking path between Centennial Park in Juliaetta and the mouth of Little Bear Creek in Kendrick. The railbed now serves as the first line of defense against flooding from the Potlatch River. Both Juliaetta and Kendrick joined the National Flood Insurance Program in 1974, which regulates development within the flood plain area around the Potlatch River.

1.1.2 Problem Definition

In the last 40 years, one of the only changes made by the City was the transition in their chlorination process from gas chlorine to liquid chlorine. The City is currently experiencing the need for additional drying bed space, particularly in the winter months when drying out biosolids is most difficult. Additionally, Juliaetta's WWTP has a comminutor and bar screen as a headworks, which does little to screen influent. As such, most solids pass through headworks and into aerated and clarifier basins. The City would like to explore alternative headworks options to help reduce the wear and tear on downstream processes and equipment.

The City's WWTP has a history of low-level noncompliance with their National Pollutant Discharge Elimination System (NPDES) permit, which is discussed in detail in Section 3.4 of this document. The chief effluent permit concern is temperature, which has potential to affect the local cold-water aquatic life and salmonoid spawning. The City has a compliance schedule to achieve compliance with the effluent temperature limits by July 31, 2031. Additionally, as the WWTP continues to age, the City faces an increased likelihood of system failures and corresponding compliance violations.

1.2 Environmental Resources Present

The following subsections provide a brief description of the environmental resources for the project and within the area of the City of Juliaetta. The majority of the environmental resources focus primarily on a radius of 1 to 5 miles. This distance allows the basis of the report to focus on potential impacts to not only the immediate area but also to those that may not be immediately impacted.

1.2.1 Land Use

Although the City of Juliaetta began as an agricultural community, the City's largest single land use today is residential. The rural atmosphere survives due to some areas within and adjacent to the City that are still used for agricultural activity. While the valley slopes serve most of the City's residential purposes, a modest collection of small businesses and light manufacturing facilities are centralized around the City's Main Street and surrounding level areas. The City plans to focus future commercial development in designated areas downtown and along Highway 3. The largest manufacturing industry in Juliaetta is the Stella-Jones utility pole yard, which does not produce significant industrial discharges.

The Juliaetta-Kendrick Joint Comprehensive Plan was last updated and adopted in 2009. It stated the following goals and objectives for land use in both cities:

- The cities maintain rules, regulations, standards, and guidelines regarding the subdivisions, development, and improvements of land.
- Require all new community development to be served by public water and sewer.

- In the case of land subdivision and development, the cost of extending utilities shall be the responsibility of the subdivider.

Additionally, the 2009 Comprehensive Plan states the following goals and objectives for industrialization of both cities:

- Reserve some land for industrial use but consider specific proposals for development on an individual basis.
- Encourage environmentally friendly industry to locate in the communities in order to provide job opportunities and preserve the quality of life in both cities.

The housing units in Juliaetta total to 339, with 68 renter-occupied units according to the 2013-2017 American Community Survey (ACS) 5-Year Estimates. Due to the topography of the City, new residential areas may require extensive earthwork to provide a proper building surface.

The 2009 Comprehensive Plan includes the City's value for appropriate zoning to preserve the existing "uncrowded" housing densities. It includes the following goals and objectives for housing:

- Designate specified areas of the community for residential and compatible uses.
- Allow agricultural land uses in residential areas subject to standards of health and safety.
- Maintain standards and guidelines for lot size and design, which are adequate to avoid creating crowded residential areas.
- Maintain standards and guidelines for mobile home and RV parks.
- Maintain and enforce codes, standards, and guidelines governing housing construction and maintenance.

Improving the function of the WWTP will help to accommodate the City's population growth.

1.2.2 Important Farmland

According to the Natural Resources Conservation Service (NRCS) National Cooperative Soil Survey, the majority of land in Juliaetta is not prime farmland. Some flatter areas in the central to northern parts of the City are classified as farmland of statewide importance, accounting for approximately 20% of the City area. Land bordering the Potlatch River would also be included in this classification if properly drained and protected from flooding. Details of the classified farmland in Juliaetta can be found in **Appendix B**.

1.2.3 Formally Classified Lands

A review of resources from the Bureau of Land Management, the United States Fish and Wildlife Service (USFWS), the National Park Service, and the United States Forest Service did not reveal any formally classified lands in the project vicinity.

1.2.4 Historic Properties

The National Register of Historic Places lists two historic buildings in Juliaetta: 1) The Bank of Juliaetta on Main Street, and 2) Abram A. Adams House on State Street. The next closest historic places to the planning area are Cox Barn and the Kendrick Downtown Historic District in Kendrick and the Nez Perce Indian Reservation.

The WWTP is over one mile from the historic properties in Juliaetta and approximately 1.35 miles from the Nez Perce Indian Reservation; no adverse effects are expected on these properties.

1.2.5 Cultural Resources

No record of cultural resources is available in the vicinity of Juliaetta from the Archaeological Survey of Idaho or Idaho State Archives.

1.2.6 Floodplains

The 2009 Comprehensive Plan states the following goals and objectives regarding flood plain development:

- Restrict flood prone areas to uses that are not vulnerable to flood damage.
- Identify and implement improvements necessary to prevent flood damage to life and property.

According to Map Service center from the Federal Emergency Management Agency (FEMA), some areas within Juliaetta are subject to flooding from the Potlatch River along the eastern border of the City, and from Potlatch Creek to the north. The Flood Insurance Rate Map (FIRM) used for the project location is 1600880001B, which is included in **Appendix C**.

The FIRM was published in 1979 and was developed during the same time that the wastewater collection and treatment facilities were designed and constructed. Examination of the FIRM indicates that the existing WWTP, and consequently the planning area, is located within a 100-year floodplain and the Special Flood Hazard Area (SFHA). The FIRM shows the 100-year flood level in the area of the WWTP facility at approximately 1035 feet, and a hydraulic profile in the WWTP operation and maintenance (O&M) manual shows the ground elevation of the structural fill site is 1042 feet. This suggests the elevation of the WWTP site is about 7 feet above the 100-year flood level. When another building on the site was constructed in the early 2000's, the mayor noted that it sat at about 10 feet above the flood plain level. (No construction or record drawings of this building could be produced to verify its elevation.) Based on this information, the wastewater treatment facility is assumed to be above the 100-year floodplain level for the purpose of facility planning. The elevation of the facility should be verified with a site survey prior to the design of any improvements.

1.2.7 Wetlands

The Idaho Department of Water Resources provides GIS data outlining Wetlands in Idaho. The data does not show any wetlands within the planning area. A map showing the wetlands in the vicinity of Juliaetta is included in **Appendix D**.

1.2.8 Biological Resources

The United States Department of Agriculture produces a database that lists endangered and threatened plants throughout the country. A database search for Idaho returns six plants listed as endangered or threatened. USFWS produces a list of endangered species for each county in every state. Currently, Latah County has three species listed as threatened by the USFWS: bull trout, Spalding's catchfly, and water howellia. Of these species, only Spalding's catchfly, a flowering plant, is found within Juliaetta city limits. In the neighboring Nez Perce County, threatened species are the bull trout, Spalding's catchfly, MacFarlane's four o'clock, and water howellia. The gray wolf is currently in recovery in both Latah and Nez Perce County. Because the majority of the priority improvements in the plan are proposed on previously disturbed lands, impacts to threatened or endangered plants and animals are not anticipated.

The Potlatch River is designated as critical habitat for Snake River basin steelhead. Approximately 8 miles downstream of the planning area, the Clearwater River is designated as critical habitat for Snake River basin steelhead, bull trout, and Snake River fall Chinook salmon. Discharge from the Juliaetta

WWTP is not expected to have any adverse effect on the Potlatch or Clearwater River due to the WWTP's low and diluted flows.

Fifteen species of migratory birds occur either on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in Latah County. The three species of migratory birds in Juliaetta are the bald eagle, golden eagle, and olive-sided flycatcher. **Appendix E** includes a report from the USFWS (as of February 14, 2019) showing endangered species in Latah County and the City of Juliaetta. Once again, because the majority of the priority improvements in the plan are proposed on previously disturbed lands, impacts to threatened or endangered wildlife and/or fish are not anticipated.

1.2.9 Surface Water

The only major body of water in the vicinity is the Potlatch River, a tributary of the Clearwater River. The Potlatch River runs along the western border of the City and forms the local boundary between Latah County and Nez Perce County. The river is heavily used for recreational fishing and swimming throughout the year, and designated beneficial uses are for cold water aquatic life, salmonoid spawning and domestic water supply. There are no United States Geological Survey (USGS), National Water Information System (NWIS), or EPA STOrage and RETrieval (STORET) datasets available for the Potlatch River in the vicinity of Juliaetta. Limited data is available from the upstream City of Kendrick, including pH and temperature data collected between 2006 and 2009.

Treated effluent from the Juliaetta WWTP is currently discharged continuously into the Potlatch River upstream of the Lewiston Basin Aquifer. In September 2008, the Department of Environmental Quality (DEQ) developed a Total Maximum Daily Load (TMDL) for the Potlatch River that applies to the segment into which the WWTP discharges. The TMDL includes waste load allocations (WLAs) for temperature and TSS.

This project will improve the quality of effluent entering the Potlatch river by addressing the requirements in the current NPDES Permit for the Juliaetta WWTP. As such, no negative effects to surface water are expected.

1.2.10 Ground Water

The Idaho Department of Water Resources maintains records of wells located in the city limits of Juliaetta. Well use includes domestic, municipal, and commercial purposes. As interpolated from static water levels in the wells, the water table slopes downward to the southeast of city limits and towards the Potlatch River. Groundwater is expected at an elevation of approximately 1,450 feet on the northwest side of the city and around 1,000 feet on the south side.

Juliaetta's effluent discharge is located upstream of the Lewiston Basin Aquifer approximately 1 mile north of the source area. A map of the Lewiston Basin sole source aquifer is included in **Appendix F**. As discussed previously, Juliaetta's effluent discharges into the Potlatch River, which is a tributary of the Clearwater River. Downstream communities such as Lewiston, Idaho draw drinking water from the Clearwater River.

1.2.11 Coastal Resources

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

1.2.12 Socio-Economic Issues

US Census Bureau data compiled in Juliaetta was used to provide socio-economic information. Based on 2017 Census data, approximately 20.6 percent of the population of Juliaetta is below the poverty level. This is significantly higher than the State of Idaho at 12.8 percent and Latah County at 16.5 percent. The median household income in Juliaetta is $36,435 compared to the State of Idaho at $50,985 and Latah County at $43,310. According to the Idaho Department of Commerce, 55.3 percent of households in the City of Juliaetta are low income.

Updates to the WWTP will improve service to the community and the longevity of the system. The City does not have the funds necessary to implement major improvements at the WWTP without funding support. The City's current sewer rates are not expected to be sufficient to maintain their operating and maintenance needs and cover any upcoming capital expenses. The City likely will need to apply for grant and loan assistance. If this is necessary, user rates will be adjusted to cover the cost of any loan repayment. However, the rate increase will be even across the entire system and will not be more for any social or economic group. Although this rate increase will be equal, it may cause additional financial hardship for some residents.

1.2.13 Climate

Juliaetta is located between two weather stations, approximately 27 miles from Moscow and 23 miles from Lewiston. The climate in this region is controlled by the Pacific Ocean. Climate data is available from the Western Regional Climate Center for Moscow between November 1893 and May 2016 and from January 1948 to June 2016 for Lewiston. According to the climate summary, the average annual high temperature is 58.1˚F in Moscow and 63.2˚F in Lewiston. The average low temperatures are 36.6˚F and 41.9˚F for Moscow and Lewiston, respectively. In both cities, the lowest average temperatures occur in January and the highest average temperatures occur in July. The City of Juliaetta reports an overall average annual temperature of 47.9˚F and an average annual precipitation of 22 inches. Based on data from Moscow and Lewiston, winds are greatest from late October to late May or early June, with average wind speeds up to over 6.5 mph. Less wind occurs through the remainder of the year, with the calmest day of the year landing between late July and mid-August. In both Moscow and Lewiston, winds come from the west from March through October, and then originate mostly from the south between November and March. The Moscow data indicates a short period of time (approximately 1.4 weeks) in January when winds come from the south.

1.2.14 Topography

The City of Juliaetta is located in the Potlatch River valley which dissects the Columbia Plateau. The valley is hedged in on either side by canyon walls approximately 1,000 feet high with a grade of about 24%. The commercial and industrial areas are situated on relatively level ground on the north side of town with a gentle downslope towards the southeast, whereas most of the residential areas are found on the steep surrounding grades. The highest elevation within city limits is found on the western boundary, at approximately 1,800 feet above sea level. The lowest elevation, approximately 1,010 feet, is in the base of the Potlatch Riverbed. The project planning area is fairly level and located at an elevation of approximately 1,040 feet.

1.2.15 Geology & Soils

According to the Idaho Geological Survey of the Juliaetta Quadrangle, the geology of the region mostly consists of surficial colluvium and landslide deposits overlying Columbia River Basalt and Latah

Formation sedimentary interbeds. Palouse Formation silty and clayey loess forms the characteristic Palouse hills on either side of the valley and alluvium and colluvium are found along the Potlatch River.

An NRCS soil survey shows that the general soil types in Juliaetta are clayey sands, silty clay, silty gravels, and cobbly ashy loams, with slopes ranging from 0 to 65 percent. Soils at the planning area are expected to be mostly clayey sands, with slopes between 0 and 3 percent. This soil type poses a moderate risk of corrosion to concrete and a high risk of corrosion to steel. Properly corrosion-resistant materials and coatings will be specified where required. Additionally, the City has noted that construction below grade, such as for basements, is often avoided in Juliaetta due to rock less than 6 feet below the ground surface.

Because the existing WWTP is located on a few feet of structural fill, encountering rock and corrosive soils is not expected.

1.2.16 Wild and Scenic Rivers

A portion of the Clearwater River is listed by the National Wild and Scenic Rivers System (NWSRS). The designated reach is the Middle Fork which extends from the town of Kooskia eastward to the town of Lowell and then splits into the Lochsa and Selway Rivers. This stretch of the Clearwater River is over 60 miles southeast of the City of Juliaetta and is not expected to be impacted by this project. No other wild and scenic rivers are listed for the Juliaetta area according to the available resources from the NWSRS.

1.2.17 Air Quality

Juliaetta is not in an air non-attainment area according to the Environmental Protection Agency, and no impacts are anticipated to air quality. The proposed project consists only of improvements to the existing Juliaetta wastewater facilities. This project is located a little over one mile from the commercial district. During construction, there may be additional odors created by the exposed biosolids. These odors may cause a nuisance to residents downwind of the project but are not hazardous. Once construction is completed, no odors are expected beyond those currently produced at the WWTP.

1.3 Population Trends

The planning population for the WWTP is be based on estimates for the year 2039. The population was projected using two methods: 1) based on historic data and 2) based on population density and the City's input on expected expansion. The greatest of these two estimates was selected as the population projection for this plan.

1.3.1 Population Projection Based on Historic Data

The US Census Bureau estimated the 2017 population of Juliaetta to be 595 persons. This estimate shows a 2.8% increase from the 2010 census (579 persons). The 2017 population density in Juliaetta was approximately 852.66 inhabitants per square mile (1.33 inhabitants per acre). The racial makeup of the City was generally 94.4% White, 4.4% Native American and Alaska Native, 0.9% from two or more races, and 0.3% Asian. Hispanic or Latino of any race was 1.4% of the population.

Table 1.3.1 lists population and growth rates for Juliaetta along with nearby communities as reported by the U.S. Census Bureau. **Table 1.3.2** shows historic and forecasted populations for the City of Juliaetta. Based on the annual exponential growth dynamic from 1990 to 2010 (0.83%), it is anticipated that the population of Juliaetta will be approximately 715 residents in 2039, a total increase of 23.5% (from 2010 population).

Table 1.3.1 – Population Growth in Juliaetta and Nearby Communities			
Community	2010 Population	2017 Population	% Change
Juliaetta	579	595	2.8%
Kendrick	302	307	1.7%
Orofino	3140	3035	-3.3%
Kamiah	1291	1290	-0.1%
Deary	504	520	3.2%
Troy	857	896	4.6%
Kooskia	660	663	0.5%
Lapwai	1134	1142	0.7%
Moscow	23840	25146	5.5%
Lewiston	31929	32820	2.8%

Adapted from:
U.S. Census Bureau. *2010 Demographic Profile Data*. factfinder.census.gov
U.S. Census Bureau. *Vintage 2017 Population Estimates*. www.census.gov

Table 1.3.2 – Historic and Forecasted Population of Juliaetta		
Year	Population	Average Annual Growth Rate
HISTORIC POPULATION DATA		
1940	337	
1950	365	0.83%
1960	368	0.08%
1970	423	1.49%
1980	522	2.34%
1990	490	-0.61%
2000	626	2.78%
2005	592	-1.09%
2010	579	-0.44%
2014	578	-0.04%
2017	595	0.98%
FORECASTED POPULATION DATA		
2018	600	0.83%
2019	605	0.83%
2020	610	0.83%
2025	636	0.83%
2030	663	0.83%
2035	691	0.83%
2039	715	0.83%

Adapted from:
Various. *Population of Juliaetta, ID.* population.us/id/juliaetta
U.S. Census Bureau. *Vintage 2017 Population Estimates*. www.census.gov

1.3.2 Population Projection Based on Expected Expansion

Little to no growth within City limits is expected due to lack of undeveloped land zoned for residential use. Rather, the City of Juliaetta expects future growth to be concentrated in areas bordering city limits in the north and south. As these areas develop, they may be annexed as future service areas for the Juliaetta WWTP. The expected future service areas are indicated in Figure 3 of **Appendix A**.

The 2039 population density of the future expansion areas is not expected to be as high as the current population density within Juliaetta city limits, due to topographic, hydrologic, and practical constraints. The expansion areas just to the north of the City limits mostly include land that is too steep for practical development. (A USGS slope map of Juliaetta and surrounding areas is included for reference in **Appendix G**.) It is estimated that approximately 60% of the expansion areas to the north of the City will be suitable for development. The expansion area just south of City limits has adequate topography for construction but is problematically located within the 100-year floodplain. It is estimated that no more than 70% of the projected expansion area south of the City will be populated in 2039.

Applying the existing population density of 1.33 people/acre to the inhabitable portions of the projected expansion areas, suggests the addition of 150 users to the wastewater system (**Table 1.3.3**). If the population within Juliaetta city limits reaches its maximum at 650 persons (an increase of 9.2% since 2017) due to zoning regulations, and the projected service areas are inhabited as described above, Juliaetta's wastewater system has the potential to serve 800 people.

Table 1.3.3 – Projected Population in Future Service Areas

Future Service Area	Area (acres)	Percentage Suitable for Development	Projected Population
1	127	60%	101
2	40.2	60%	32
3	17.6	70%	16
Expected Population Growth in Expansion Areas:			150

The planning population for improvements to Juliaetta's WWTP will be taken at 800 people in the year 2039, because of expected growth just outside of City limits. This population is more conservative than the estimate of 715 persons suggested by historic data.

No additional factors have been identified to expect a significant change in population growth trends within the Juliaetta wastewater service area, thus, these projections are considered realistic long-range projections for Juliaetta.

1.4 Community Engagement

All project progress reports were provided to City operations staff, the Mayor, and members of the City Council. Study findings and alternatives were presented first to a technical advisory group which included the Mayor, two city operators, and the City Clerk. Findings and alternatives were then presented to the public at a public meeting on August 20, 2020. Prior to the public meeting, a notice was sent out to local residences with their monthly city utility billing notifying them that this presentation would occur. Attendance was taken at the meeting and written comments collected and transcribed (see **Appendix H**). In addition, a draft of this report was made available for public comment at City Hall for at least 2 weeks prior to final adoption by City Council.

CHAPTER 2 EXISTING FACILITIES

2.1 Location Map & History

Before the WWTP and collector line was completed in 1976, the City relied on septic drain fields for wastewater disposal. The septic system was over operating capacity by the mid 1960's, and residents of Juliaetta still recall the days when septic overflow leaked into neighbors' yards and gardens during these years. Efforts to fund the construction of a wastewater treatment facility began as early as 1964, and support for the WWTP was collected by door-to-door visits and a community petition. When the issue came before the City council, the vote for the WWTP was unanimous. The WWTP was funded by a municipal bond, and construction was completed in 1976.

The WWTP is located on a structural fill site on the south side of the City and just east of Highway 3 (**Figure 2.1.1**). A garage-like building is also located on the site north of the WWTP. This building was constructed circa 2005 and houses the City's fire emergency vehicle and other tools and equipment.

Figure 2.1.1 – Location Map of WWTP

In 2005, the Juliaetta WWTP was classified as a Class II Treatment System with a score of 54 points on the DEQ Wastewater Treatment Plant Rating Form. This means that even small improvements to the treatment process may qualify the Juliaetta WWTP for Class III ranking. The two current WWTP employees are operators in training, and one is taking steps to obtain his Class II certification. The previous operator has recently retired. Upgrading to a Class III facility would require additional training and certification for the Juliaetta WWTP staff.

2.1.1 Treatment Process

The Juliaetta WWTP uses an extended aeration activated sludge process with micro-screen effluent polishing and chlorine disinfection. Major components of the existing facility are the lift station, grit tank, extended aeration unit, clarifier, mechanical and micro-strainer building, chlorine contact

chamber, and sludge drying beds. There have been no major renovations or expansions to the original components to date. Small improvements include a new blower motor in 2010 and switching from disinfecting with chlorine gas to using a hypochlorite solution. A schematic process diagram and a simple map of the existing WWTP are included in **Figures 2.1.2** and **2.1.3**, respectively.

The City's municipal wastewater is collected by gravity sewer lines and transported to the lift station at the WWTP site. Juliaetta uses a Smith and Loveless "wet well mounted sewage pump lift station". An aluminum trash basket is installed on the outlet of the interceptor sewer pipe to prevent objects over 2 ½" in diameter from making their way into the wet well. From the lift station, the influent is pumped through the aerated grit removal tank where dense solids such as sand and gravel are removed. Solids from grit removal are emptied into drying beds and removed by hand shovel. Water collected in the grit drying beds flows through a gravity underdrain back to the lift station wet well. After grit removal, the wastewater flows by gravity to the comminutor which grinds up remaining solids before heading to secondary treatment. A bar screen on the comminutor is intended to capture any remaining large solids and prevent them from entering the aeration basin.

Wastewater that passes through the comminutor flows into the aeration basin, where it is mixed and aerated by coarse bubble diffusion. After aeration, the wastewater flows by gravity into the three-hopper bottom clarifier, where the activated sludge is separated by sedimentation and wasted from the bottom of the clarifier to drying beds. The clarifier effluent overflows into the micro-strainer effluent polishing unit for fine solid removal.

The micro-screens have a mesh opening of 27µ. After passing through the micro-screen, the wastewater flow is dosed with liquid sodium hypochlorite and then passed through a chlorine contact chamber. The effluent is dechlorinated by calcium thiosulfate tablets before being discharged.

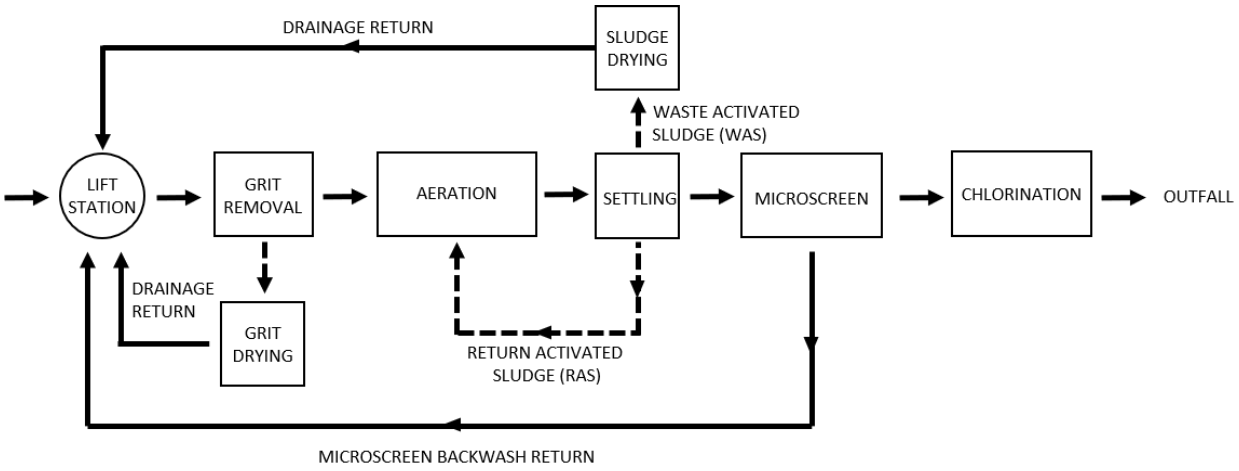


Figure 2.1.2 – Schematic Diagram of Juliaetta WWTP Process

Figure 2.1.3 – Juliaetta WWTP Layout

2.2 Condition of Existing Collection System

The City of Juliaetta owns and operates its own wastewater collection system. This section provides an overview of the condition of the City's wastewater collection system.

2.2.1 Pipelines and Manholes

The City of Juliaetta owns approximately 5.27 miles of gravity pipelines and 94 manholes. Pipe sizes range from 6 inches to 10 inches in diameter. Figures 1 and 2 in **Appendix A** show the existing collection system including pipe sizes, pipe materials, and the location of manholes, cleanouts, and lift stations. These figures were developed based on the original record drawings from 1975 and known additions identified by the operators.

2.2.2 Pipe Materials

The original plans for the Juliaetta sewer collection system indicate that most of the system is made up of asbestos cement (AC) pipe. This pipe material consists of portland cement reinforced with asbestos and sometimes silica and was a popular choice for water and wastewater applications in the early to mid-1900s because of its low cost and relatively high strength-to-weight ratio. Construction of AC pipelines in the United States was mostly discontinued by about 1980 due to health concerns.

Today, continued exposure to asbestos is a recognized link to respiratory disease and cancer, however "most people are exposed to small amounts of asbestos in their daily lives and do not develop health problems" (DEQ, *Asbestos and Air Quality*). As such, the EPA regulates the cutting, demolition or removal of AC pipe. "Friable" asbestos materials are of the greatest concern because they can be easily crushed or reduced to a dry powder. Undisturbed and undamaged AC pipe is considered non-friable, but most condition assessment techniques require the excavation and removal of pipe samples.

The estimated useful life of undisturbed AC pipe can range from 40 to 70 years. AC pipe deterioration or failure can be caused by low alkaline water, soft water, corrosive properties of the soil, high water pressures, soil shrinking and swelling, other external loadings, or simply old age. Common failure modes include circumferential breaks, longitudinal splits, joint failure, and softening that leads to blowouts.

Residents of Juliaetta recall that maintenance on the sewer lines have involved uncovering and repairing green PVC pipes, not AC pipes. It is possible that the collection system was constructed wholly or in part with materials other than the AC shown in the record drawings.

2.3 Condition of Existing WWTP Facilities

The following sections will describe the present conditions of the facilities at the Juliaetta WWTP. Comments will be made regarding the suitability of the components for continued use with regards to their performance and capacity. The standards considered include those from the DEQ, Recommended Standards for Wastewater Facilities ("Ten State Standards"), and Idaho Administrative Procedures Act (IDAPA) Wastewater Rules.

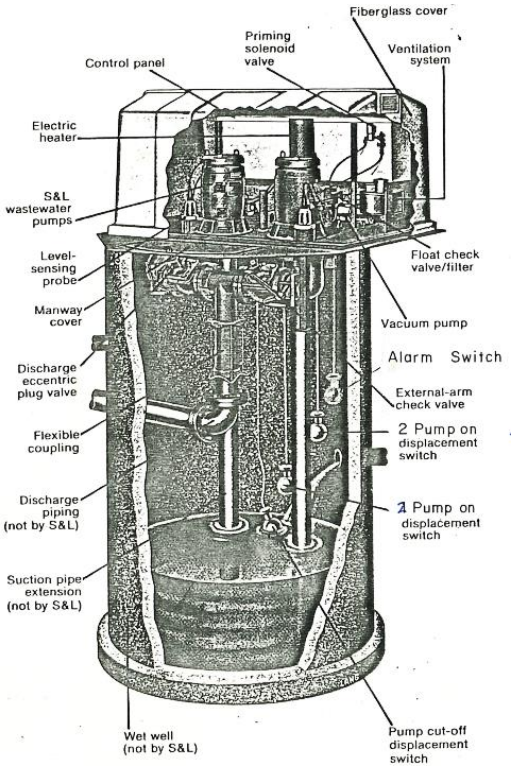
2.3.1 Lift Station

The lift station at the Juliaetta WWTP is a Smith & Loveless "wet well mounted sewage pump lift station" from circa 1977 (**Figure 2.3.1**). In addition to raw wastewater from the gravity interceptor line, the lift station also pumps backwash from the microstrainer and drainage from the grid and sludge drying beds for recirculation through the WWTP.

Components of the lift station include:

- Two (2) self-priming vertical radial flow sewage pumps
- Two (2) eccentric plug valves
- Two (2) check valves
- Four (4) displacement-type water level switches
- Central control panel with circuit breakers and motor starters

An aluminum trash basket with approximate dimensions 1'-0" x 8" x 1'-6" is installed at the outlet of the interceptor sewage pipe. This basket was intended to capture objects greater than 2 ½ inches in diameter from entering the wet well. The basket is removed every other day or as necessary and emptied into the grit drying bed. Although the operators do not report issues with grit accumulation, this trash basket is not sufficient grit prevention as recommended in the Ten State Standards and IDAPA Wastewater Rules.



Hoffmann, Fiske & Wyatt Consulting Engineers. *Operation & Maintenance Manual: Juliaetta, Idaho Wastewater Treatment Facility.* Page 17. June 15, 1977.

Figure 2.3.1 – Drawing of Lift Station Wet Well

Interior components of the lift station including piping, valves, and manway cover were observed to be extensively corroded (**Figure 2.3.2**). A rope attached to the aluminum trash basket with a carabiner is currently used for supplementary support and retrieval. The wiring support rod and the trash basket rope appear to have been repaired or reinforced with electrical tape, however the electrical wiring itself did not show signs of corrosion. The lift station electrical work most likely met previous standards and codes, but it is unknown whether it is compliant with current electrical regulations. Any modification or updates to the lift station will include updated electrical systems.

Above grade, a hinged, lock-less, fiberglass cover houses the control panel and two pumps (**Figure 2.3.3**). The mechanical skid shows signs of corrosion where metal is exposed through peeling paint. The lift station wet well can be accessed for maintenance through the unlocked 2'-0" x 1'-2" manway hatch. This maintenance hatch is smaller than the 24-inch diameter access dictated in the Ten State Standards and is not suitable means of access for maintenance personnel wearing self-contained breathing equipment as required by IDAPA Wastewater Rules.

Through the manway hatch, retrofitted steel ladder rungs extend down into the wet well. The original access ladder, now heavily corroded, remains in place but is not suitable for use.

According to record drawings, the lift station wet well (**Figure 2.3.4**) is 4'-0" in diameter and 21'-3" deep. The design working storage capacity is 300 gallons. The lift station is cleaned weekly with a chemical degreaser and the floats are cleaned occasionally. Based on the wet well drawings in the WWTP Operation & Maintenance Manual, the wet well is presumed to have a flat bottom, which likely

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.2 – Corroded Lift Station Interior

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.3 – Above-Grade Lift Station Components

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.4 – Lift Station Wet Well

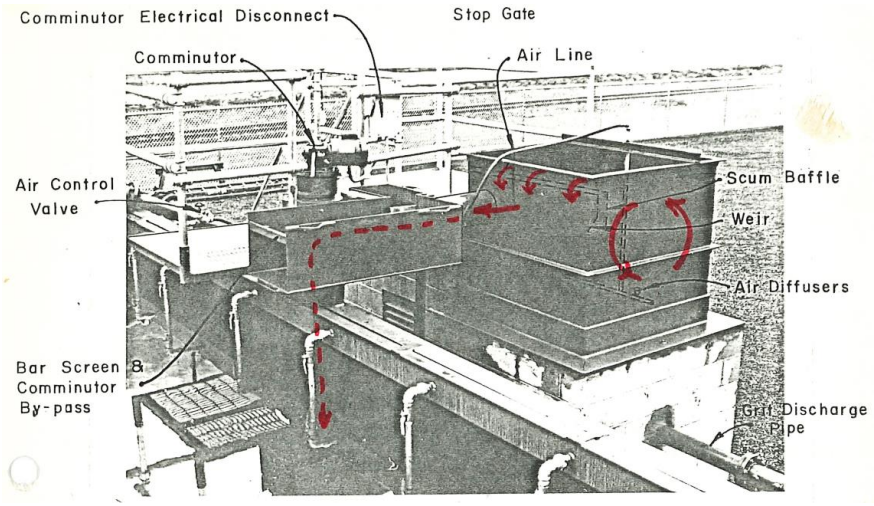
contributes to accumulated scum and noxious sludge. The wet well design criteria in Chapter 40 of the Ten State Standards includes a minimum floor slope of 1:1 to the hopper bottom.

The lift station is designed for a peak inflow of 200 gpm (gallons per minute) and the design pumping rate is 150 gpm with a max pumping rate of 300 gpm. There is no equipment for flow monitoring at the lift station, so actual flow rates are estimated based on pump run times. One of the lift station pumps was rebuilt in the spring of 2016, but have otherwise never been replaced. The WWTP operators report that the lift station pumps require periodic re-priming and have occasionally lost prime overnight, which suggests that the mechanical pump seals are failing. Recently, due to issues with priming, one pump in the lift station has been taken offline. This means that there is no pumping redundancy in the lift station, and the pumping capacity is reduced to 150 gpm. There is no record of any instance of the lift station overflowing.

2.3.2 Preliminary Treatment Equipment

An aerated grit chamber, comminutor, and bar screen by-pass (**Figure 2.3.5**) are intended to minimize rags, gravel, and other inorganic solids from passing through the treatment facility. Two (2) 7.5 hp LEESON blowers and two (2) Gardner Denver air compressors housed in a hinged fiberglass cover (**Figure 2.3.6**) provide air to the grit chamber, as well as the aeration basin and air-lift pumps for scum and RAS/WAS. A new blower motor was installed in 2010. Bubbling air in the grit chamber lifts and rolls the wastewater as it passes through, helping sand, pebbles, metals, glass, and other dense solids to settle to the bottom for disposal. The design air flow diffused into the tank is 1 ft/s (foot per second).

The grit chamber (**Figure 2.3.7**) is fabricated of 3/16-inch thick steel plate; the tank is 4'-0" in diameter and 5'-10" deep including the hopper bottom. A ¾-inch rubber hose feeds air into the tank through four air diffusers on a 1 ½-inch thick galvanized steel pipe. A bent steel plate forms a small weir in the tank (**Figure 2.3.8**). This weir is intended to act as a scum baffle and prevent grease and other floating solids from flowing into the aeration basin. Grit is emptied from the chamber every other day or as necessary, and accumulated buildup is cleaned weekly from the grit chamber surfaces.

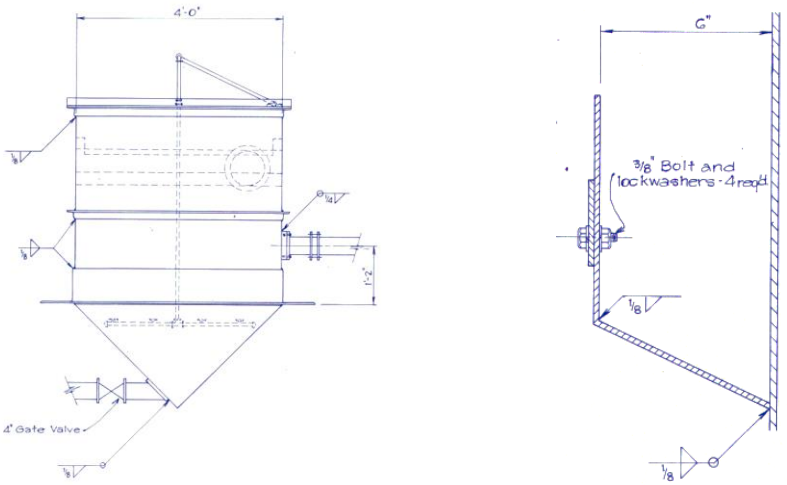


Hoffmann, Fiske & Wyatt Consulting Engineers. *Operation & Maintenance Manual: Juliaetta, Idaho Wastewater Treatment Facility*. Page 28. June 15, 1977.

Figure 2.3.5 – Primary Treatment Equipment

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.6 – Compressed Air Equipment



Hoffmann, Fiske & Wyatt Consulting Engineers. *Grit Tank Details*. [c. 1977] Engineering Drawing. Lewiston, ID.

Figures 2.3.7 & 2.3.8 – Grit Chamber & Weir Details

While the tank itself appears to be in adequate condition (**Figure 2.3.9**), the pipe flanges between the grit chamber and comminutor channel are severely corroded and deteriorating (**Figure 2.3.10**).

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.9 – Grit Chamber

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.10 – Pipe Flanges

The comminutor is powered by a ½ hp (horsepower) LEESON motor (**Figure 2.3.11**) and is automatically controlled by the WWTP lift station. Critical replacement parts, such as the carbide teeth (**Figure 2.3.12**) and comb, are not available for the comminutor, making the longevity and effectiveness of the machine of great concern. Damage to the carbide teeth of the comminutor indicates that grit may be passing through the grit chamber and making its way through the comminutor.

The efficiency of the comminutor has decreased over time, requiring frequent bypassing through the bar screen. Without the use of a reliable comminutor to grind solids, larger solids and rags make their way into the aeration chamber. These larger solids take up space in the aeration tank and are more difficult for bacteria to degrade. The WWTP operators have expressed concern regarding the system's ability to handle modern plastic products and "flushable" items that find their way to the WWTP. Currently, buildup is severe enough that it must be removed from the comminutor 2 or 3 times per month.

Keller Associates. Juliaetta WWTP. January 16, 2019.

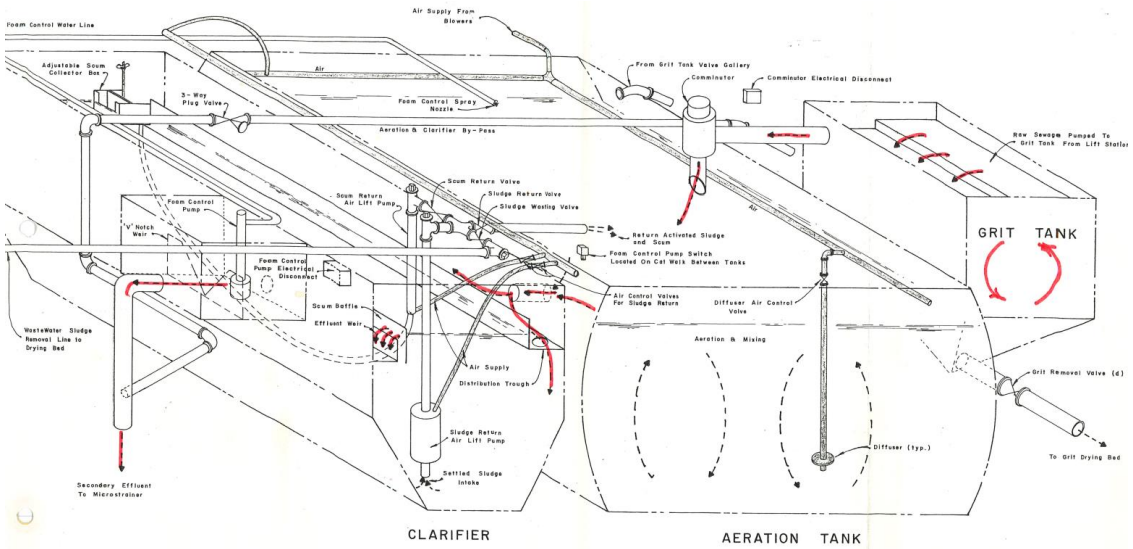
Figure 2.3.11 – Comminutor Motor & Bar Screen

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.12 – Comminutor Carbide Teeth

2.3.3 Aeration Basin

The aeration basin at the Juliaetta WWTP is approximately 38'-0" x 34'-0" x 10'-0" (**Figure 2.3.13**). It was designed to fill to a depth of approximately 9 feet (about 87,000 gallons). The original design criteria included a detention time greater than 24 hours, an air supply of 2500 ft^3/lb BOD/day, and an organic loading of 15 lb BOD/1000 ft^3 of tank/day.



Hoffmann, Fiske & Wyatt Consulting Engineers. *Operation & Maintenance Manual: Juliaetta, Idaho Wastewater Treatment Facility.* Page 43. June 15, 1977.

Figures 2.3.13 – Extended Aeration Process

Three PVC lines return activated sludge from the bottom of the clarifier to the aeration basin to mix with the raw wastewater and biologically break down organic matter. The tank is aerated by compressed air passed through eighteen (18) diffusers along the north and south ends of the aeration basin. Based on drawings in the O&M manual and records from Smith & Loveless, the aerators are disc diffusers.

Oxidation and paint wear are apparent on the tank exterior and at pipe connections (**Figures 2.3.14 & 2.3.15**) which may indicate deeper damage to the tank and pipe materials. On the exterior of the tank, a 4-inch diameter pipeline provides the emergency bypass over the aeration basin and clarifier. The pipe is designed to rest on a wooden block with a pipe strap securing the pipe and block to the tank. The

bypass pipe has evidently been weld-repaired, some pipe straps have broken, and some bolts are in poor repair (**Figures 2.3.16 & 2.3.17**). None of the wooden blocks remain from the original installation.

Regular maintenance at the aeration basin requires weekly rag removal, monitoring foam levels, and skimming solids off the tank. There is no redundancy to allow the aeration basin to be taken offline for maintenance or repair. Consequently, the aeration basin has not been emptied and cleaned since it was constructed in the 1970's. It is expected that significant solids buildup has accumulated in the aeration basin, reducing the effective volume of the tank.

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figures 2.3.14 & 2.3.15 – Oxidation on Aeration Basin Exterior

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figures 2.3.16 & 2.3.17 – Aeration Basin & Clarifier Bypass Pipe

2.3.4 Clarifier

The three-hopper bottom clarifier is approximately 10'-0" x 34'-0" x 9'-0" (**Figure 2.3.13**). Settled sludge in the bottom of the clarifier is drawn up by an air lift pump and either returned to the aeration basin or wasted to the sludge drying beds. A second air lift pump draws scum from the scum collector box and returns it to the aeration basin through the common RAS line. Sludge is wasted from the clarifier by opening the sludge wasting valve and closing the sludge return and scum return valves.

The clarifier shows similar deterioration to the aeration basin, including exterior oxidation and worn paint. It appears that some corroded portions of the clarifier walls have been repainted (**Figure 2.3.18**). Associated valves show significant oxidation as well (**Figure 2.3.19**), and at least one valve is difficult to operate by hand. The box housing for the 1/3 hp foam spray airlift pump has been corroded through the wall, leaving a small hole (**Figures 2.3.20 & 2.3.21**).

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figures 2.3.18 & 2.3.19 – Oxidation on Clarifier Exterior & Appurtenances

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figures 2.3.20 & 2.3.21 – Oxidation on Foam Control System Pump Housing

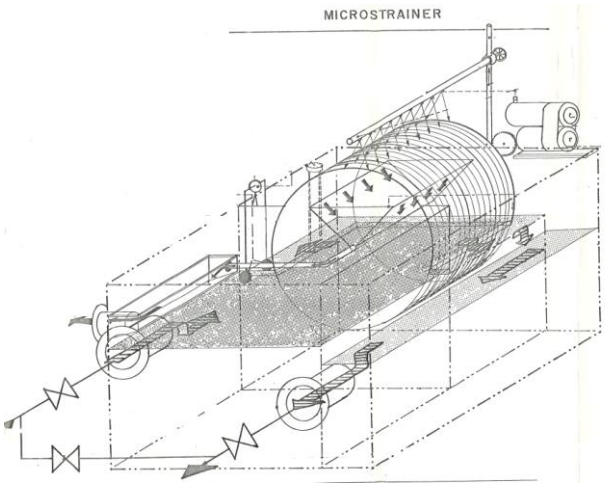
Frequent maintenance performed on the clarifier includes general daily cleaning, weekly cleaning with a wire brush when wasting, and maintaining sprinkler heads for foam suppression. Like the aeration basin, there is no redundant structure for the clarifier to allow for maintenance or repair.

2.3.5 Microstrainer

The microstrainer consists of a rotating drum and stainless-steel mesh with 24 µm openings (**Figure 2.3.22**). Solids collected from the flow of wastewater through the microscreen are continuously backwashed with water that flows back to the lift station wet well. No overflow is shown on the drawings of the microstrainer.

The performance of the microstrainer is dependent on the proper function of preceding equipment. Additionally, the microstrainer relies on the extended aeration process to remove greasy solids and scum. There is no redundancy that allows the microscreen to be taken offline. If the screen mesh were to fail and a suitable replacement could not be found, the microstrainer will short circuit.

Common maintenance required by the microstrainer includes daily cleaning of the filter and lubing bearing zerks, weekly cleaning of the water jets and effluent chamber, and thorough cleaning of the effluent chamber every six months. Parts of the microstrainer show rust and corrosion including valving, piping, and the microscreen housing (**Figures 2.3.23 & 2.3.24**). The operators report the microscreen and chain drive are a “constant problem” and screen mesh for this equipment is no longer available.



Adapted from Hoffmann, Fiske & Wyatt Consulting Engineers. *Operation & Maintenance Manual: Juliaetta, Idaho Wastewater Treatment Facility.* Page 85. June 15, 1977.

Figures 2.3.22 – Microstrainer Diagram

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figures 2.3.23 & 2.3.24 – Microstrainer & Piping

2.3.6 Chlorination Facilities

Prior to discharge, the wastewater effluent is disinfected using a 12.5% sodium hypochlorite solution. Currently between 5 and 7 gallons of 12.5% sodium hypochlorite are used for disinfection each day. The solution is dosed into a manhole to mix with the wastewater before heading to the contact chamber (**Figures 2.3.25 and 2.3.26**). There is no mechanical mixer to ensure a good mix between the chlorine and the treated wastewater.

The chlorine contact chamber has an approximate volume of 6,000 gallons. At the current peak hour flow rate of 250 gpm, the contact period would be approximately 25 minutes. Ten States Standards (a frequently referenced guideline) requires a minimum contact period for chlorine of 15 minutes at the peak hour flow. At the 2039 peak hour flow, the approximate contact period in the chlorine contact chamber would be 18 minutes. Calcium thiosulfate dechlorination tablets are applied to the downstream end of the chlorine contact chamber.

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.25 – Hypochlorite Solution

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figure 2.3.26 – Chlorine Contact Chamber

The chlorination equipment appears to be in good repair. The 2017 DEQ compliance inspection noted that the colorimeter in use had a resolution of 0 .1, which does not meet EPA sampling and analysis methods and detections limits. The colorimeter has not been upgraded since the inspection.

The existing chlorine contact chamber was designed to be use slide gates to isolate each side as a separate chamber. The slide gates have gone missing over the years, so it is not currently possible to take the chamber down for cleaning. Chemical dosing pumps and additional sensors could automate the disinfection process; providing just the right amount of chemicals to the water and saving the City from overusing chemicals.

2.3.7 Sludge Drying Beds

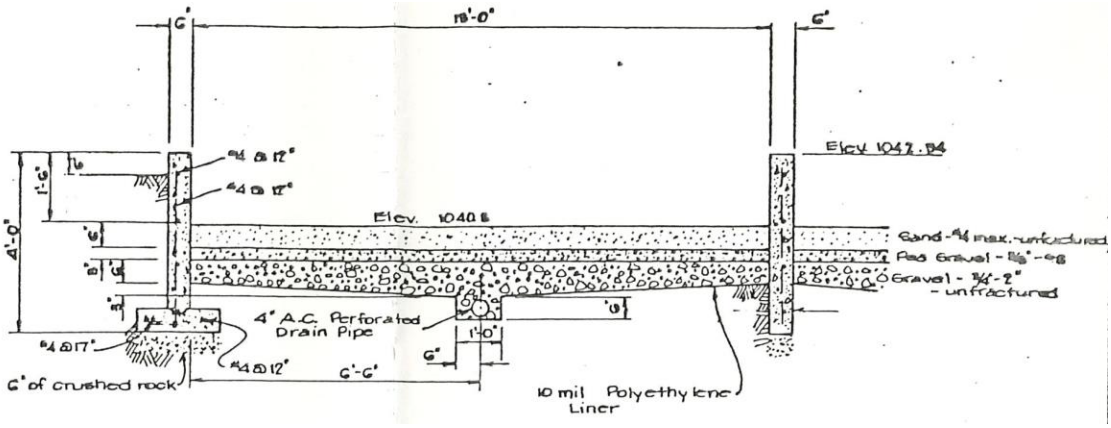
Sludge that is wasted from the clarifier is piped to the four covered drying beds (**Figures 2.3.27 & 2.3.28**). Each bed is approximately 41'-0" x 13'-0" and consists of percolating materials overlying an underdrain system that flows to the lift station wet well (**Figure 2.3.29**). The beds are separated on four sides by 6-inch thick concrete walls that extend approximately 6 inches above finished grade.

The underdrain system is shown in record drawings as 4-inch diameter AC pipe, with cast iron pipe stubbing through the concrete wall surrounding the drying beds. As previously mentioned, it is possible that PVC pipe was installed for the underdrain system instead of AC pipe. This pipe size is consistent with Ten State Standards for underdrains, however the condition of the pipe is unknown. If the pipe is AC and has become damaged over its 40-year life, the entire pipeline must be removed and replaced with a ductile iron line using proper AC handling procedures. According to the O&M manual and record drawings, nine (9) inches of ¾-inch to 2-inch gravel is placed over the underdrain, followed by 3 inches of pea gravel, and finally 6 inches of sand. The first gravel layer is acceptable according to Ten State Standards, but it is also recommended that the second layer of gravel be at least 3 inches of gravel between 1/8 inch and ¼ inch in diameter and the sand layer should be of at least 9 to 12 inches of clean, hard, washed coarse sand. The bottom of the drying bed is delineated by a 10-mil polyethylene liner between the gravel layer and native material.

The sludge flows over a splash pad as it enters the drying bed to prevent washing the bed surface, then thickens by gravity. Once the depth of sludge in one drying bed reaches about four (4) inches, the dewatered sludge "cake" is removed from service to allow for dewatering. When the sludge bed is sufficiently dry, the sludge is removed and transported to the Clearwater County Transfer Station. The WWTP Operation and Maintenance Manual instructs the use of hand shovels to remove the sludge from

Keller Associates. Juliaetta WWTP. January 16, 2019.

Figures 2.3.27 & 2.3.28 – Sludge Drying Beds



Hoffmann, Fiske & Wyatt Consulting Engineers. *Operation & Maintenance Manual: Juliaetta, Idaho Wastewater Treatment Facility.* Page 107. June 15, 1977.

Figure 2.3.29 – Sludge Drying Bed Typical Section

the beds and specifically states that use of a front-end loader in the sludge drying bed may crush or otherwise damage the AC pipe. The current operators habitually use the front-end loaders to remove dried sludge from the beds, and it is unknown whether the underdrain pipe has been affected.

The sludge drying beds are exposed on all sides but covered overhead by a corrugated metal roof with fiberglass translucent panels that are supported on wood trusses. The cover structure is generally in good repair, with only a few instances of damage in the corrugated metal roof that could be locally repaired. The operators report that freezing causes a significant hardship during cold weather. The beds can freeze for months at a time which limits the ability to waste from the clarifier. Even in the warmer months, the existing storage is not sufficient to handle the sludge produced by the treatment process. Additionally, the exposed sludge storage beds attract vectors, which can lead to the spread of pathogenic organisms.

2.4 Redundancy & Capacity

Upgrades to the City's existing wastewater facilities could be recommended based on the need for equipment redundancy and/or hydraulic or treatment capacity. The following paragraphs describe the criteria for redundancy and capacity and an assessment of the facilities.

2.4.1 Redundancy Analysis

The EPA and Ten State Standards provide redundancy guidance as follows:

1. At least two units are required for screens, pumps, secondary clarifiers, aeration basins, blowers, and disinfection equipment
2. The firm capacity (capacity with the largest unit out of service) should be sufficient to provide for peak flow through pumps, 75% of design flow through secondary clarifiers, and design oxygen transfer through blowers.

2.4.2 Capacity Limitations

To identify potential bottlenecks in the treatment processes, each WWTP component was evaluated based on both the process performance and the hydraulic limitations. The process and hydraulic capacities of the existing WWTP equipment are estimated based on known dimensions, record drawings, and the original design criteria (**Tables 2.4.1 and 2.4.2**). A hydraulic profile of the WWTP from the original plans is included in **Figure 2.4.1**.

Table 2.4.1 – Original Process Design Criteria (1975)

BOD_5 Loading			Removal
ppcd	lb/day	mg/L	%
0.2	160	240	90

Adapted from: Hoffmann, Fiske & Wyatt Consulting Engineers. *Sewage Treatment Plant Plan*. [c. 1974] Engineering Drawing. Lewiston, ID.

Table 2.4.2 – Original Hydraulic Design Criteria (1975)

Average Flow			Max Flow
gpcd	mgd	gpm	gpm
100	0.08	55.6	200

Adapted from: Hoffmann, Fiske & Wyatt Consulting Engineers. *Sewage Treatment Plant Plan*. [c. 1974] Engineering Drawing. Lewiston, ID.

The existing Juliaetta WWTP was designed to process a BOD_5 loading of 160 lb/day. In the first six months of 2019, the WWTP recorded monthly BOD_5 loadings were approximately 96% of the original design criteria. This indicates that the process capabilities of the existing treatment equipment are near their design capacity.

Lift Station

The lift station includes two 150-gpm suction lift pumps. However, only one of these pumps is operational, creating a redundancy issue. If the remaining pump were to become inoperable, the lift station would have no firm capacity. Replacing or repairing the broken pump would increase the firm capacity of the lift station to 0.22 mgd. The existing lift station is undersized to handle the current peak hour flow of 0.36 mgd (250 gpm) and will be severely undersized for the projected 2039 peak hour flow of 0.48 mgd (333 gpm).

Grit Chamber & Comminutor

The grit chamber and comminutor can be bypassed through a manually cleaned bar screen bypass. Damage observed on the comminutor suggests that grit may not be adequately removed in the grit chamber, even though the grit chamber is sized for a peak flow of 0.43 mgd based on record drawings. The bar screen and comminutor are assumed to be designed for a peak hour flow of 0.29 mgd based on

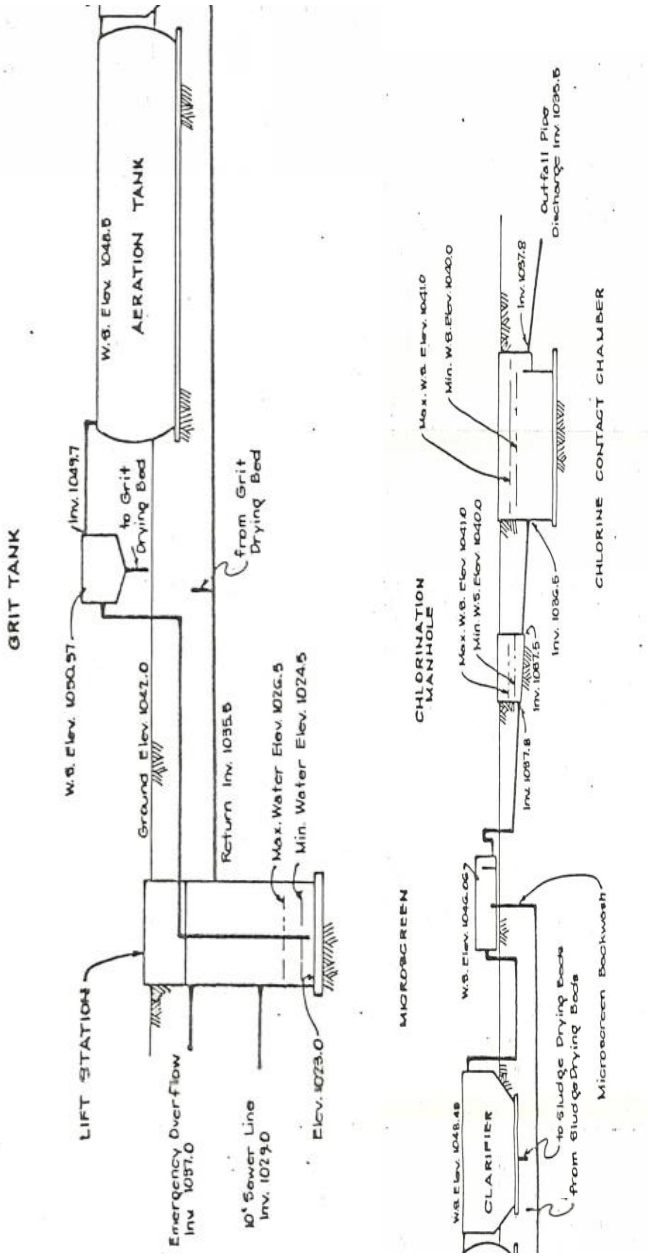


Figure 2.4.1 – Juliaetta WWTP Hydraulic Profile

record drawings. This is already exceeded by the current peak hour flow of 0.36 mgd. Additionally, as previously discussed, the comminutor is limited by the availability of replacement parts, which are no longer on the market.

Aeration Basin

The existing aeration basin has dimensions of approximately 38’-0” x 34’-0” x 10’-0” and is sized for a design flow of 0.08 mgd, which is undersized for the current maximum month flow of 0.10 mgd. The Juliaetta WWTP has only one aeration basin and no reserve aeration equipment, which does not comply with the previously discussed redundancy criteria. Additionally, the aeration basin has not been drained

for inspection, repair, or cleaning since its construction. It is expected that the capacity of the tank is less than the design capacity due to material (rags, grit, etc.) built up in the tank.

Secondary Clarification

Secondary clarification is provided in a three-hopper bottom clarifier with the approximate dimensions of 10'-0" x 30'-0" x 10'-0". Like the aeration basin, there is only one clarifier, which does not meet redundancy requirements. Additionally, the clarifier has never been taken offline for maintenance. The clarifier is sized for a peak hour flow of 0.29 mgd, which is less than the current peak hour flow.

Microstrainer

There is no redundancy for the microstrainer. Additionally, as mentioned previously, some replacement parts are not available.

Chlorination System

The total volume of the chlorine contact chamber is estimated at 6,000 gallons. As observed in the field and in the record drawings, the existing chlorine contact chamber has provisions to operate as a two-channel system by dividing the basin with fiberglass stop gates. However, the original stop gates are no longer at the WWTP. Therefore, the chlorine contact chamber cannot be taken down for maintenance, which can affect effluent quality. Based on the current peak hour flow, the existing chlorine contact basin would not be large enough to handle the current peak hour flow with one half of the basin down for maintenance. However, during low flow periods, if it were again possible to have two chlorine contact channels, it might allow necessary maintenance to be done. Using Ten States Standards requirement for a minimum chlorine contact period of 15 minutes at the peak hour flow, half of the chlorine contact basin (3,000 gallons) would be sufficient for a peak hour flow of 200 gpm

Summary

The capacities described in the following sections, are summarized in **Table 2.4.3**. The firm capacity refers to the capacity of the process with the largest unit offline.

Table 2.4.3 – WWTP Capacity Summary

Component	Existing Capacity	2019 Capacity Required	2039 Capacity Required	Limiting Factor
Lift Station (mgd)	0.22	0.36 (PHF)	0.48 (PHF)	Redundancy & Capacity
Grit Chamber (mgd)	0.43	0.36 (PHF)	0.48 (PHF)	Performance & Capacity
Comminutor (mgd)	0.29	0.36 (PHF)	0.48 (PHF)	Performance & Capacity
Aeration Basin (Incl. Blowers) (mgd)	0.08	0.10 (MMF)	0.14 (MMF)	Redundancy & Capacity
Secondary Clarification (mgd)	0.29	0.36 (PHF)	0.48 (PHF)	Redundancy & Capacity
Microstrainer (mgd)	0.29	0.36 (PHF)	0.48 (PHF)	Performance
Chlorination System (mgd)	0.55	0.36 (PHF)	0.48 (PHF)	Redundancy & Capacity

2.4.3 Effluent Performance

This section evaluates the effluent quality from the existing WWTP relative to current effluent limits for BOD_5, TSS, pH, total residual chlorine, and *E. coli* bacteria.

BOD_5

Monthly and weekly BOD_5 data from January 2015 through June 2019 are shown in **Figures 2.4.2** through **2.4.5**, along with the discharge limits included in the NPDES permit. No BOD_5 violations were noted during this period. In addition, the WWTP met the current 85% removal requirement for the entire period as shown in **Figure 2.4.6**. The effluent BOD_5 loads were also consistently lower than the permitted maximum average monthly and weekly loads.

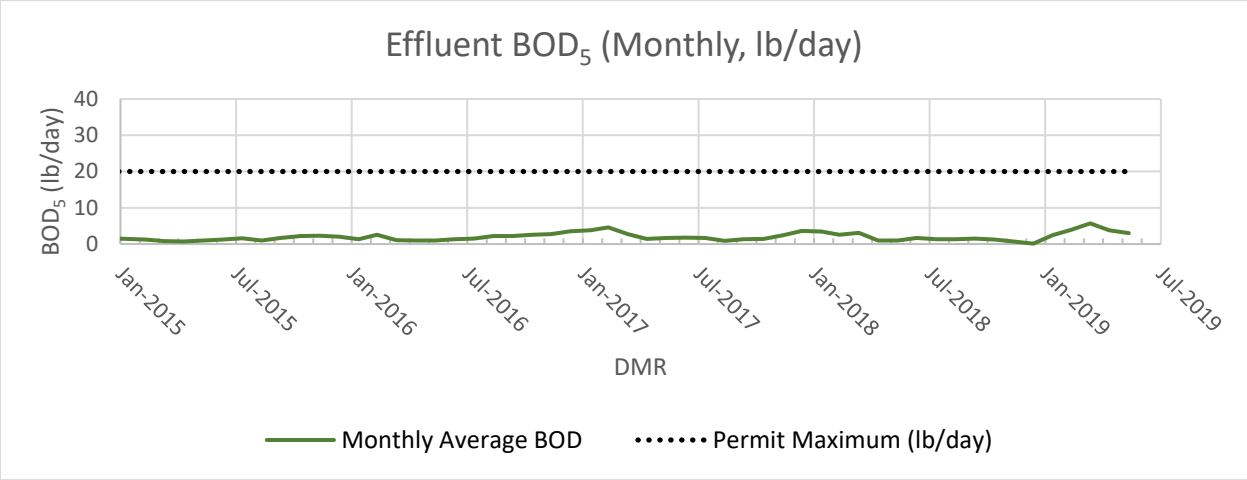


Figure 2.4.2 – Monthly Average Effluent BOD_5 (lb/day)

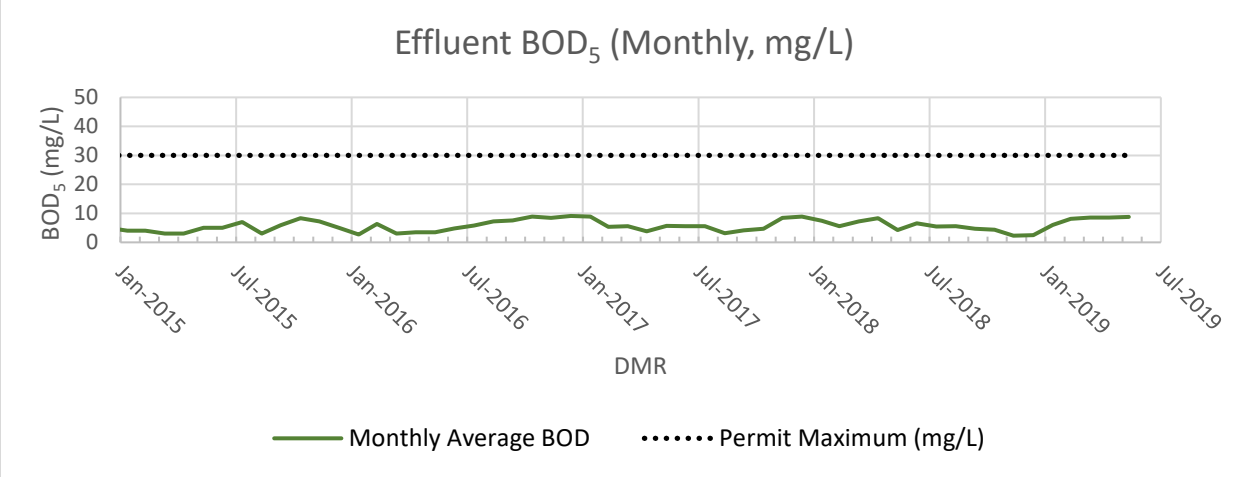


Figure 2.4.3 – Monthly Average Effluent BOD_5 (mg/L)

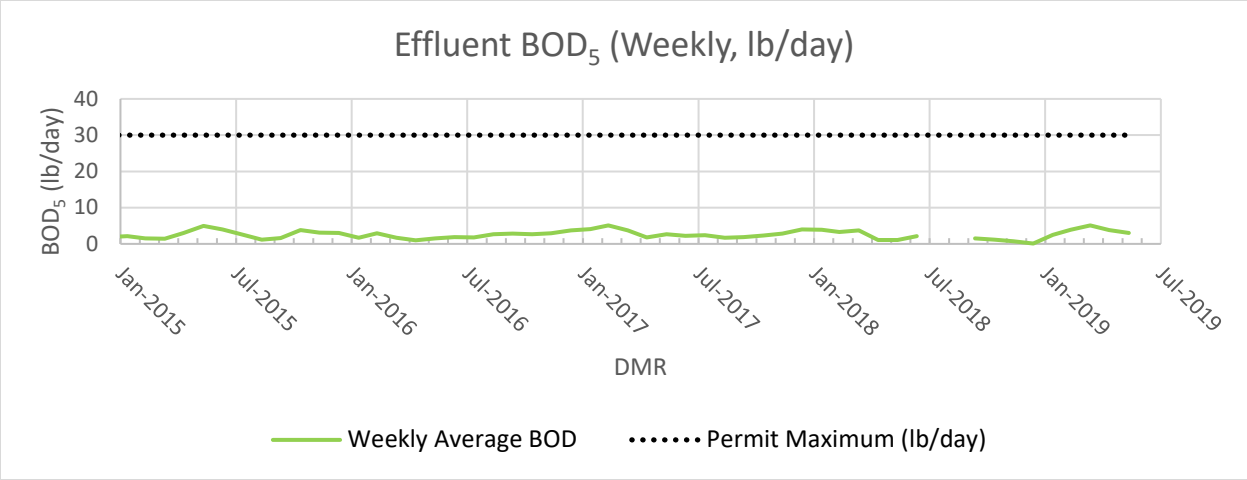


Figure 2.4.4 – Weekly Average Effluent BOD_5 (lb/day)

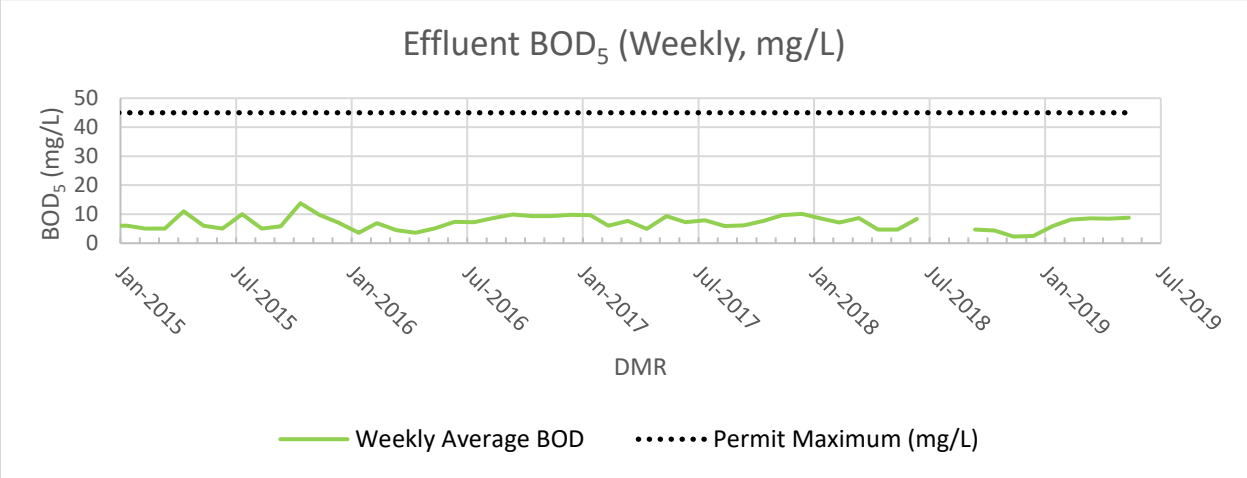


Figure 2.4.5 – Weekly Average Effluent BOD_5 (mg/L)

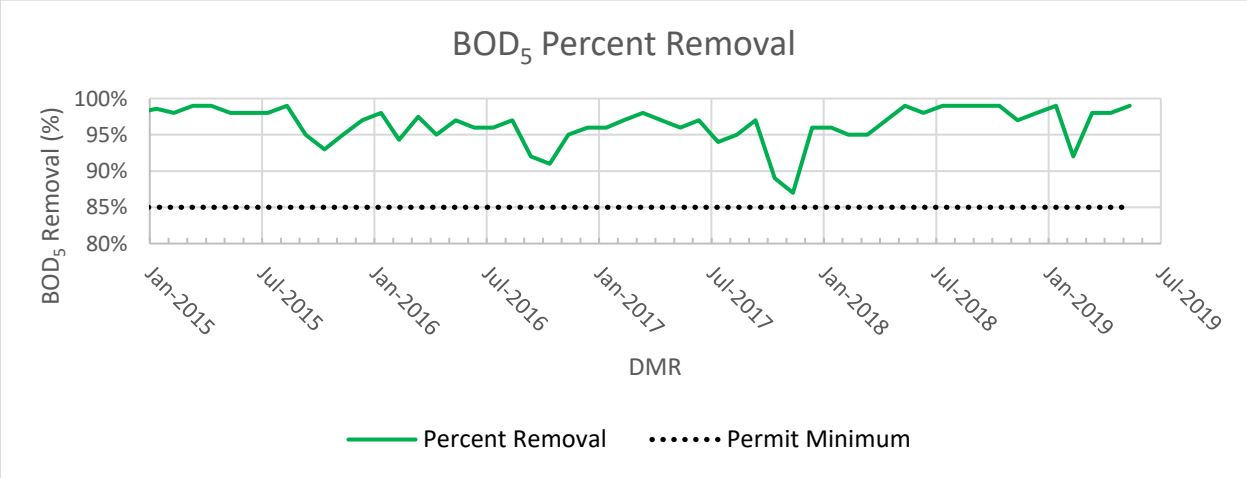


Figure 2.4.6 – Monthly BOD_5 Removal

TSS

The monthly and weekly effluent TSS data and their respective NPDES permit limits are included in **Figures 2.4.7** and **2.4.10**. As shown, no TSS violations are recorded for the period of time between January 2015 and June 2019. The monthly average TSS removal is shown in **Figure 2.4.11**, which shows that the WWTP has met the permit requirement of 85% removal; however, it is approaching this level.

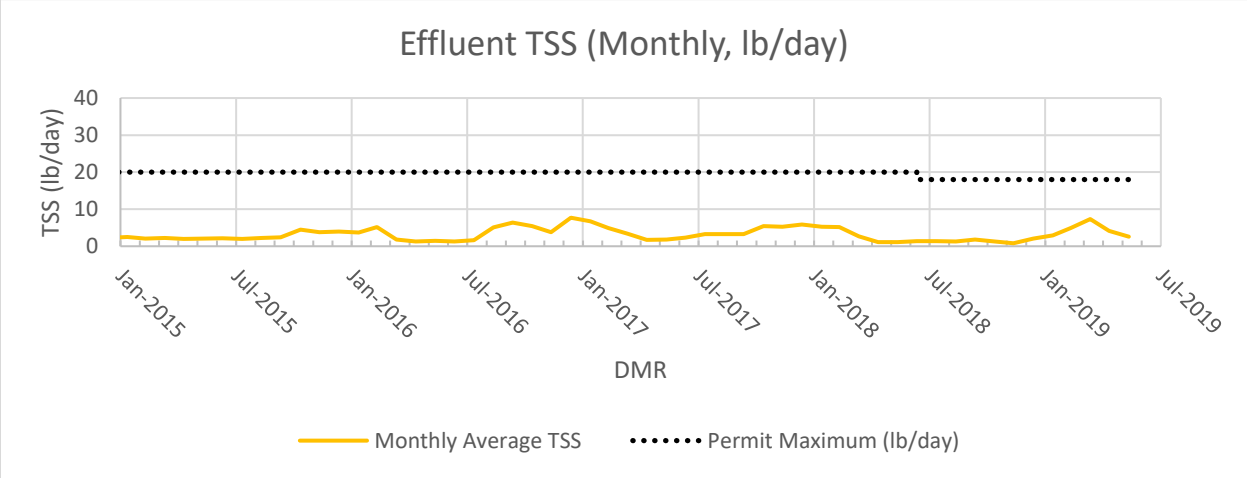


Figure 2.4.7 – Monthly Average Effluent TSS (lb/day)

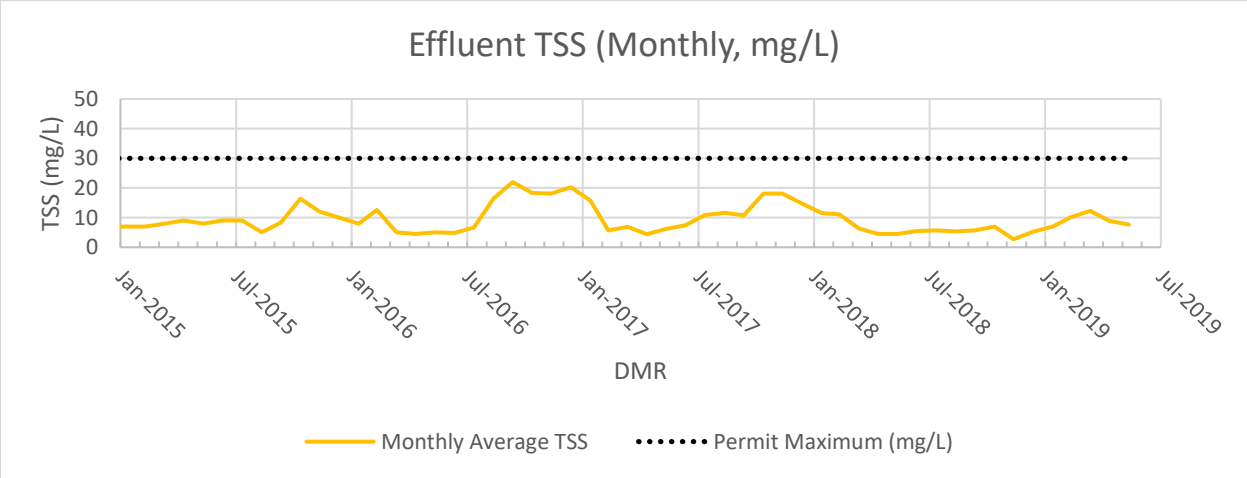


Figure 2.4.8 – Monthly Average Effluent TSS (mg/L)

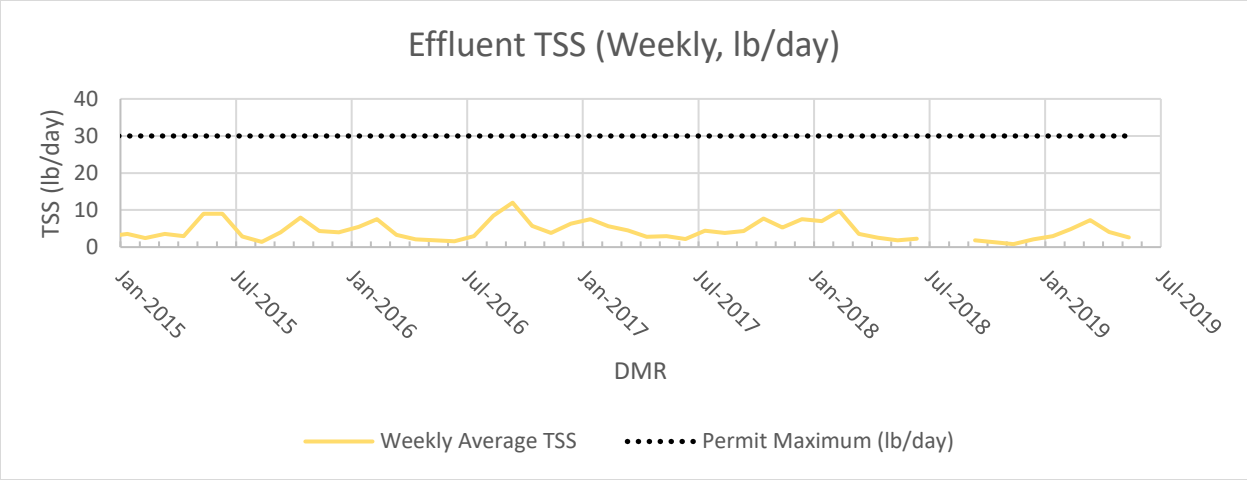


Figure 2.4.9 – Weekly Average Effluent TSS (lb/day)

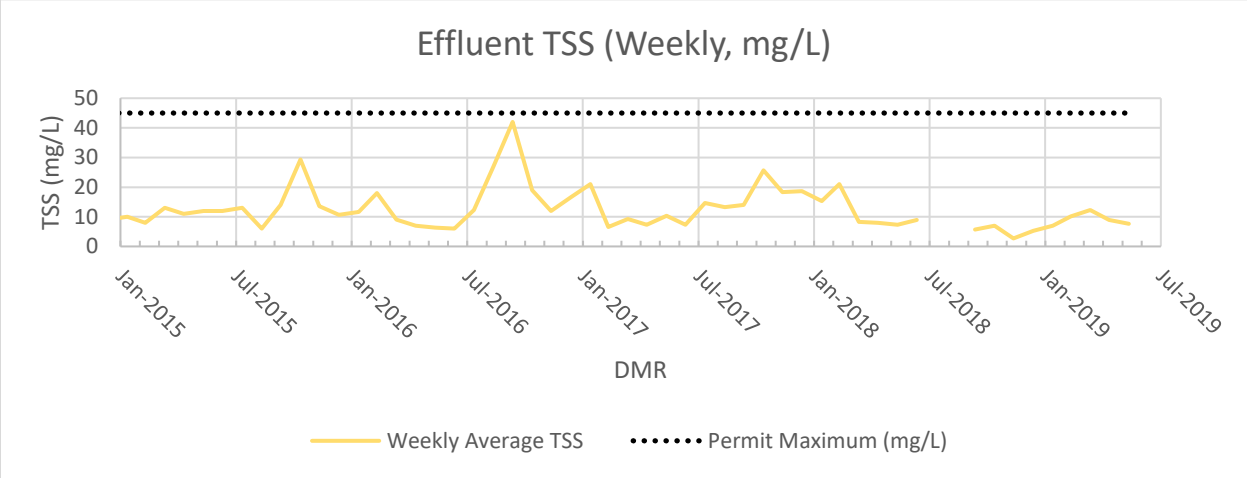


Figure 2.4.10 – Weekly Average Effluent TSS (mg/L)

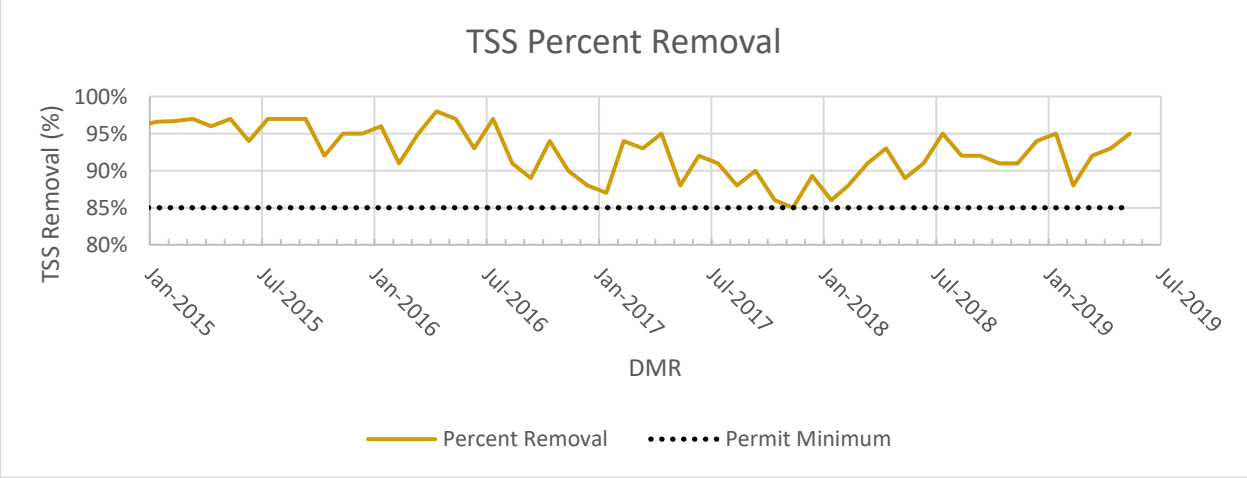


Figure 2.4.11 – Monthly TSS Removal

pH

The maximum and minimum effluent pH values and their respective limits are shown in **Figure 2.4.12** for the period between January 2015 and June 2019. In this time frame, there have been several reported instances of a minimum pH equal to the permit minimum, and one violation with low pH. The pH of the effluent tends to be on the low end of the range allowed by the NPDES permit. A low pH may be caused by low pH influent, or issues in the treatment process.

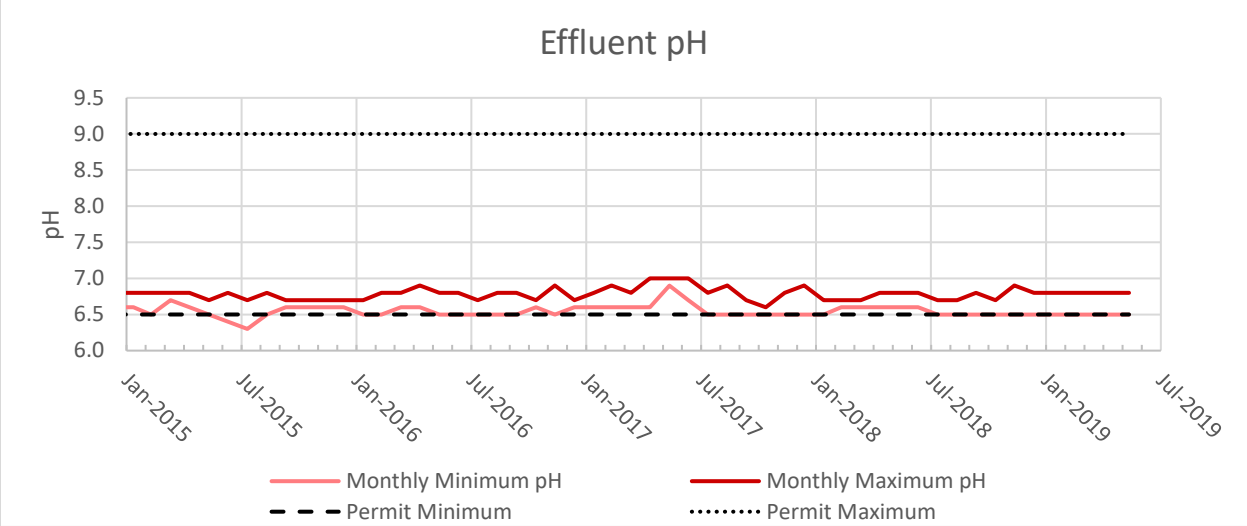


Figure 2.4.12 – Monthly Minimum & Maximum pH

Total Residual Chlorine

In August 2018, the permit maximum for total residual chlorine changed from a monthly average of 0.10 mg/L to a weekly average of 0.012 mg/L. Due to the difficulty in detecting this low chlorine level, the NPDES permit states that the average monthly and maximum daily concentrations must be less than 0.05 mg/L. As shown in **Figure 2.4.13**, there have been no total residual chlorine violations within the period of January 2015 through June 2019; however, the measurements are approaching the limits.

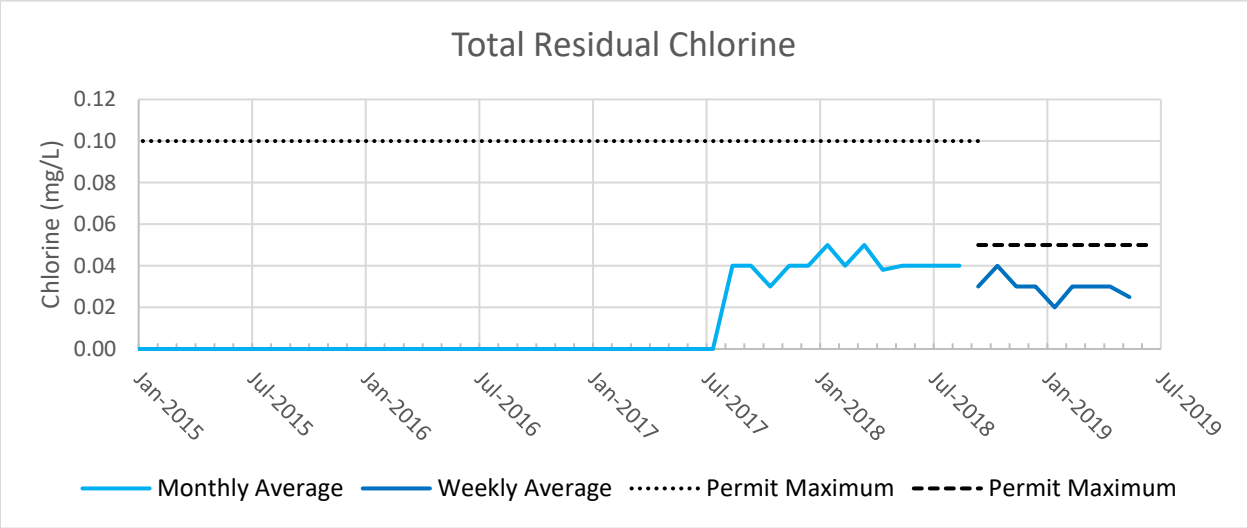


Figure 2.4.13 – Monthly & Weekly Average Total Residual Chlorine

E. coli

The limit in the NPDES permit for *Escherichia coli* (*E. coli*) is a monthly average of 126/100mL. As shown in **Figure 2.4.14**, there have been no violations of the limit during the period of January 2015 to June 2019; however, the measurements are approaching the limits.

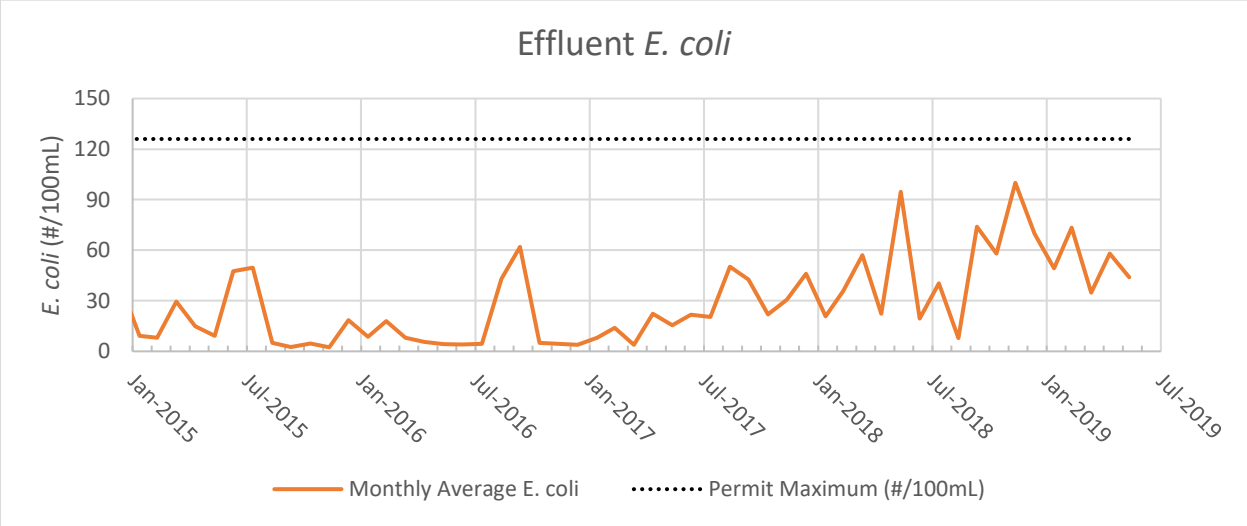


Figure 2.4.14 – Monthly Average *E. coli*

2.5 Financial Status of Existing Facilities

Juliaetta's fiscal year begins on October 1st and ends on September 31st, for example Fiscal Year 2019 began on October 1st 2018 and ended on September 31st 2019. The following summarizes Juliaetta's current financial status for their wastewater utility and provides recommendations for future rate increase that may be needed to continue to operate and maintain their current system.

2.5.1 Current Rate Schedule

Wastewater system users in the City of Juliaetta are billed monthly. The City's rate structure is simple, which utilizes a single base rate per user, regardless of whether it's a residence, commercial building, or other. See Section 2.7 for a breakdown of Equivalent Dwelling Units (EDUs) on Juliaetta's system. The following is a history of the City's rate structure over the last five years.

Sewer rates have climbed steadily in the last five years at an average rate increase of 5.6% per year (8.3% increase in FY 2018). This demonstrates that the City Council and Mayor understand the need to continually raise rates to cover the rising cost of operating and maintaining a public wastewater system.

Monthly user rate revenue versus system operating expenditures were compared over the last five fiscal years and illustrated in **Figure 2.5.1**. The City raised the base user rate from $28.09 to $30.00 in October 2019. For the last five years, the revenue has been insufficient to cover the operation and maintenance expenditures, which is not sustainable. A comparison of the City of Juliaetta's existing user rate with those of similar communities throughout Idaho is illustrated in **Figure 2.5.2**. As of October 1, 2019, the City's rate is comparable to other communities of similar size that have not improved their system in over 10 years. Kooskia (+3%), Deary (+3.5%), Notus (+$2.00), and Pierce (+3%) all have planned increases to their rates in October 2020.

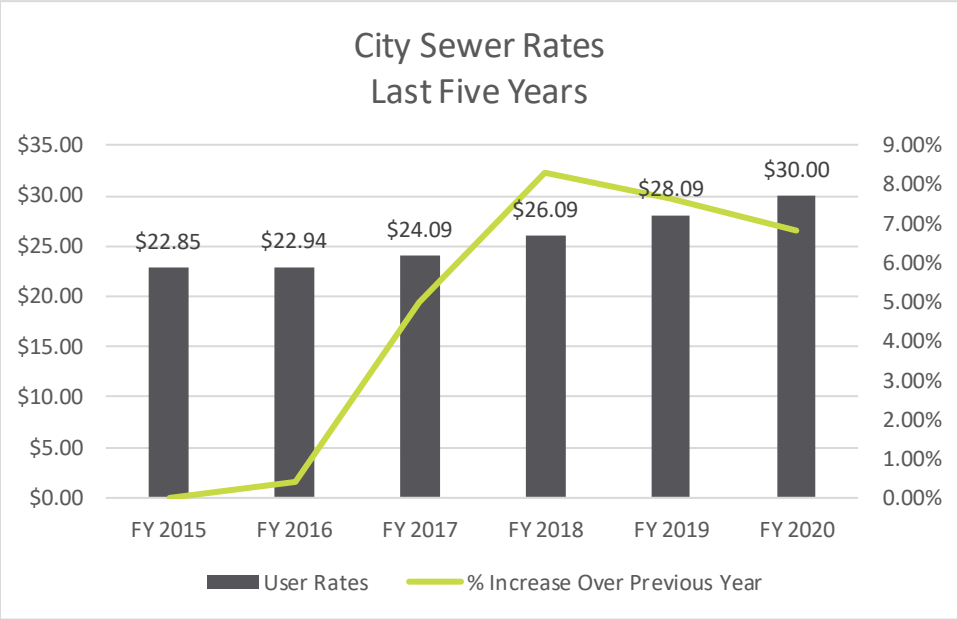


Figure 2.5.1 – City Sewer Rates, Last Five Years

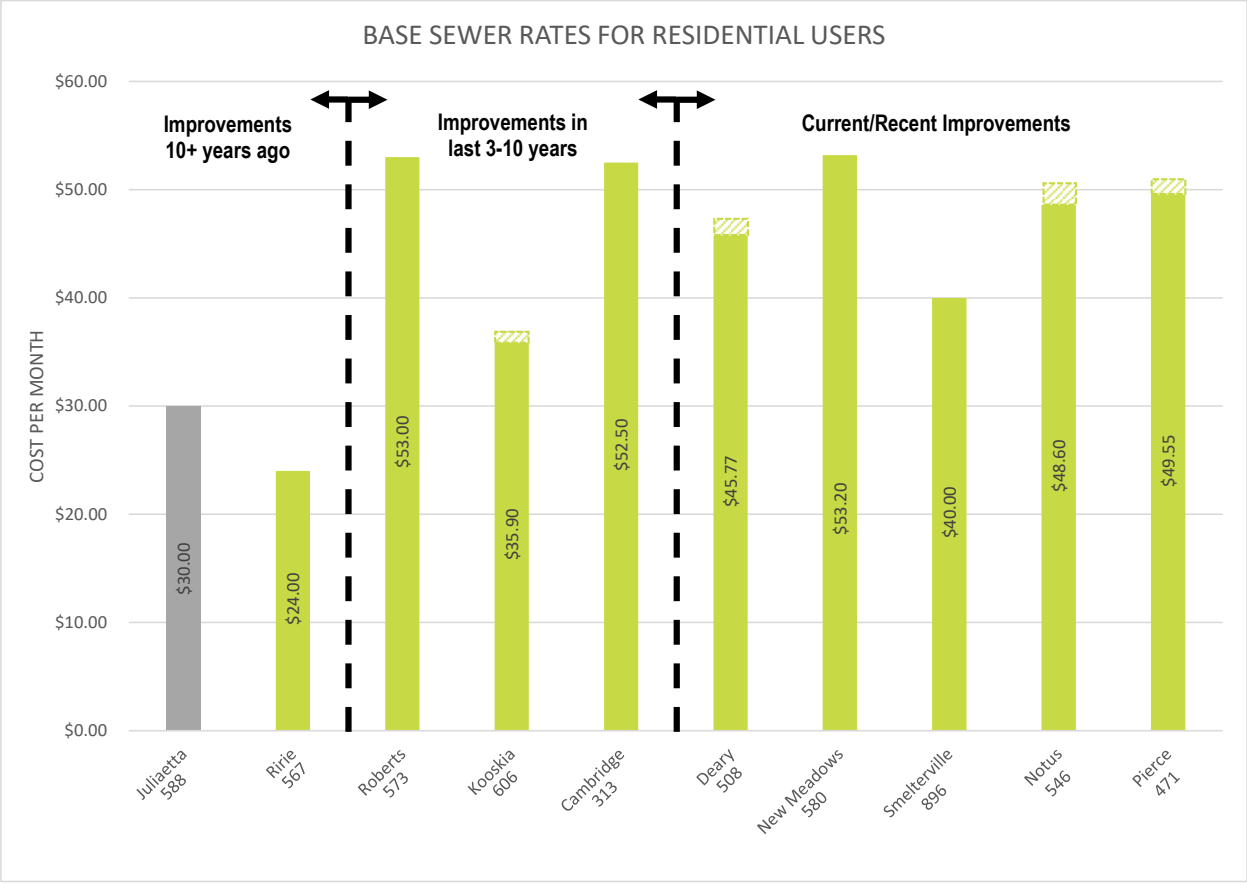


Figure 2.5.2 – User Rate Comparison

2.5.2 Existing City Wastewater Budget

The City's current wastewater rate structure includes a base rate that is collected from each EDU on a monthly basis. The City has only one category of users. Monthly user rate revenue versus system operating expenditures and compared over the last five fiscal years, as shown in **Table 2.5.1** and **Figure 2.5.3**. Juliaetta's fiscal year begins on October 1st and ends on September 31st, for example Fiscal Year 2019 began on October 1st 2018 and ended on September 31st 2019. The City raised the base user rate from $28.09 to $30.00 in October 2019. For the last five years, the revenue has been insufficient to cover the operation and maintenance expenditures, which is not sustainable.

Table 2.5.1 – Historical Wastewater System Revenues and Expenditures

	Actual[1]					Budgeted[2]
Existing Connections	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020 (Projected)
# of EDUs	312	290	307	306	310	293
Annual Expenses						
Existing O&M	$96,083	$102,635	$111,976	$99,176	$80,334	$96,929
Existing WWTP Bond Payment	$0	$0	$0	$0	$0	$0
Total Expenses	**$96,083**	**$102,635**	**$111,976**	**$99,176**	**$80,334**	**$96,929**
Typical Monthly User Rate/EDU	$22.85	$22.94	$24.09	$26.09	$28.09	$30.00
User Rate Income						
Revenue	**$68,907**	**$73,895**	**$77,808**	**$80,949**	**$92,213**	**$102,473**
Net Revenue	-$27,177	-$28,740	-$34,168	-$18,227	$11,878	$5,543

(1) FY 2015 - FY 2019 revenue and expenses came from City's historical records of actual revenue and expenses

(2) FY 2020 revenue and expenses came from City 2019-20 budget

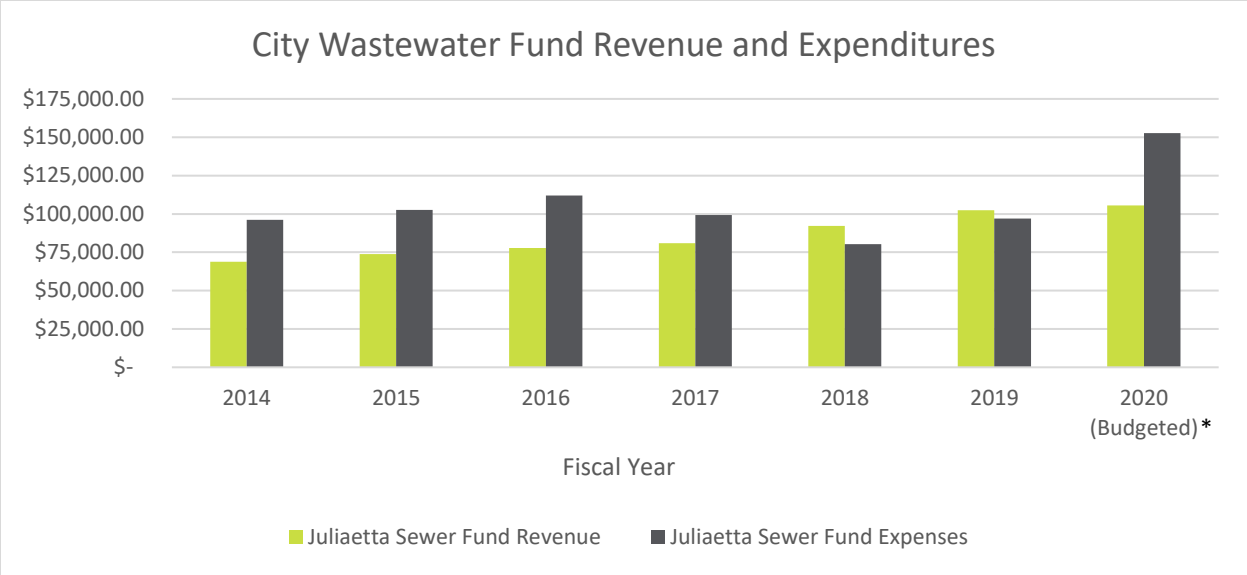


Figure 2.5.3 – Wastewater System Expenditures Versus Revenue

**The City historically has budgeted conservatively for expenses each year. Actual expenses come in about $50,000 lower than budgeted (see 2019 actual). 2019 budgeted expenses were similar to what is shown for 2020.*

A summary of existing expenditures, including O&M costs, and revenue over the last 5 years is included in **Appendix H** along with a glance at the current FY 2020 budget and expected revenue.The projected O&M costs associated with improvements to the wastewater collection system and wastewater treatment plant will be discussed in Chapters 6 and 7, respectively. The proposed sewer rate is dependent on possible funding sources and will be discussed in Section 8.7 of this document.

2.5.3 Other Capital Improvement Programs

The City completed a joint transportation plan with the City of Kendrick in September 2018. The Juliaetta/Kendrick Joint Transportation Plan includes a capital improvement plan for the next 20 years for roadway and pedestrian improvements needed throughout the City.

The City last updated their Water Master Plan in 2002 and is currently in the process of a new update which includes a capital improvement plan for the next 20 years for water system and treatment improvements.

When implementing collection system improvements, the City should coordinate efforts with both the transportation and water master plans where possible.

2.5.4 Existing Debts and Reserve Accounts

The City of Juliaetta does not currently have any debt in their wastewater system and has no reserve accounts.

2.6 Water/Energy/Waste Audits

No audits for water, energy or waste have been conducted at the Juliaetta WWTP facility.

In September 2017, the DEQ conducted an inspection of the Juliaetta WWTP on behalf of the United States Environmental Protection Agency (EPA) to determine compliance with the facility's NPDES permit. Concerns that were noted by this inspection include:

- The operational logs did not include the time and location of sampling or indicate who performed the sampling and analyses
- The operation logs did not document supporting calculations
- The effluent flow was determined by referencing the run times of the influent pumps instead of flow measurement
- The total chlorine records only included data before the effluent is dechlorinated, and chlorine samples were analyzed using a colorimeter with a resolution of 0.1

Besides using an upgraded colorimeter, these concerns have not yet been addressed by Juliaetta WWTP staff.

2.7 EDU's and Average Residential Flow Data

The City of Juliaetta owns and operates a municipal wastewater system composed of a collection system with sewer collection lines, a lift station, and a wastewater treatment plant that provides wastewater service to 257 customers equating to 294 EDU's in 2020. This breaks down to 55 commercial or multi-family residential units and 238 single family residences. **Table 2.7.1** lists the total number of customers and connections over the last five years, and **Table 2.7.2** provides a breakdown of commercial or multi-family residential units on the City's system.

Table 2.7.1 – Equivalent Dwelling Units (EDUs)

Year	# Of Customers	EDUs
2015	256	312
2016	255	290
2017	272	307
2018	272	306
2019	273	310
2020	257	293

Table 2.7.2 – Commercial (Non-Single Family) Customers

Customer Name	Type of Use	# of EDUs Billed
Ahmann, Greg (Manor Apartment Building)	Apartments (22 units)	22
Bottoms Up	Bar / Restaurant	2
Browning Cut Stock	Lumber Mill	1
Colter's Creek Winery	Bar / Restaurant	1
First Bank of Pizza	Restaurant	2
Flipside Properties	Apartments (5 units)	5
Geo F Brocke & Sons (Grain Elevator)	Industrial	1
Groseclose, Dick	Duplex	2
Groseclose, Dick	Duplex	2
Groseclose, Ed	Garage	1
JCIA	Community Center	1
Juliaetta Community Church	Church	1
Juliaetta Market	Grocery	1
Juliaetta Post Office	Government Building	1
Latah County Library	Government Building	1
Nazarene Church	Church	1
Kendrick School District	School Buildings	8
River Bean Coffee	Restaurant	1

Stella-Jones Corp	Poll Mill	1
Total		**55**

The 2039 planning criteria was determined based on monthly DMRs completed by the Juliaetta WWTP Operators, which includes peak and average monthly flows, average weekly and monthly BOD_5 concentrations, and average weekly and monthly TSS concentrations. Flow data from 2015-2019 DMRs and BOD_5 and TSS data from 2013-2019 DMRs were analyzed to determine the existing hydraulic and organic loadings at the Juliaetta WWTP. The populations given in **Table 2.7.3** were used to develop per capita loadings.

Table 2.7.3 – Population Data 2015-2018

Year	Population
2013	578
2014	578
2015	580
2016	586
2017	595
2018	600

2.7.1 Influent Flows

Influent flow data is measured each day based on run times from the lift station pumps. As previously mentioned, the accuracy of this measurement technique is undefined as it is unknown whether the flowrate is constant during the pumping period. It is recommended, prior to beginning the design of any improvements, that the flow measurements be confirmed with at least a year's worth of accurate flow data. For the purpose of this report, data from the years 2015 through 2019 were used to determine average day, peak day, and peak hour flows.

It is noteworthy that unusually large flows were reported during the monitoring period of March 2017. The City has commented that excessive flooding occurred in this month, and these flows may indicate infiltration and inflow (I & I) to the collection system. This data point was included in the calculation of design flows because there is no plan currently in place to address and mitigate I & I issues in the system.

In order to take the next step towards addressing I & I issues, it is recommended that the City conduct additional analysis on the collection system including influent and collection system flow monitoring, collection system TV inspection and smoke testing, collection system conditions assessments, and evaluation of recommended repairs. See Section 4.1 for additional information on this need.

Annual Average Day Flow

The annual average flows included in DMRs from January 2015 through June 2019 (**Table 2.7.4**) ranged from 0.033 to 0.053 million gallons per day (mgd), with a mean of 0.043 mgd. Using the populations given in **Table 2.7.3**, the daily per capita flows were found to range from 57.4 to 88.4 gpcd, with an average of 71.8 gpcd. For planning purposes, this value was used to project average influent flows in the year 2039 for a population of 800 people, which gives an average annual flow of 0.057 mgd.

Table 2.7.4 – Average Day Flow Data & Planning Criteria

Year	Average Day Flow		
	gpcd	mgd	gpm

2015	57.4	0.033	23.1
2016	70.3	0.041	28.6
2017	78.0	0.046	32.2
2018	64.7	0.039	27.0
2019	88.4	0.053	37.1
Average	71.8	0.043	29.6
2039 Planning Criteria	71.8	0.057	39.9

Maximum Month Flow

The greatest reported monthly flow value for each year is given in **Table 2.7.5** for January 2015 through June 2019. These values ranged from 0.04 mgd to 0.10 mgd. The daily per capita flows ranged from 74.1 to 173.1 gpcd. Using 173.1 gpcd as the maximum day flow per person and the projected population, the 2039 maximum month flow was projected to be 0.14 mgd. This value corresponds to a peaking factor of approximately 5.

Table 2.7.5 – Maximum Month Flow Data & Planning Criteria

Year	Maximum Month Flow			Max Month
	gpcd	mgd	gpm	
2015	74.1	0.04	30	February
2016	112.6	0.07	46	March
2017	173.1	0.10	72	March
2018	93.3	0.06	39	March
2019	117.4	0.07	49	April
Maximum	173.1	0.10	72	
2039 Planning Criteria	173.1	0.14	96	

Maximum Day Flow

The Juliaetta WWTP only reports monthly flow data on their DMR's but keeps handwritten records of the daily flows seen through the WWTP. To determine the maximum daily flow value, the handwritten records from the March 2017, the month with the highest monthly flow values in five years, were digitized and analyzed. The handwritten records are included in **Appendix H**, and suggest a maximum day flow of 152 gpm, or 367.6 gpcd (**Table 2.7.6**). Using this per capita flow rate, the maximum day flow in 2039 is found to be 204 gpm, which corresponds to a peaking factor of approximately 8.35.

Table 2.7.6 – Maximum Day Flow Data & Planning Criteria

Max Day	Maximum Day Flow		
	gpcd	mgd	gpm
March 20, 2017	367.6	0.22	152
2039 Planning Criteria	367.6	0.29	204

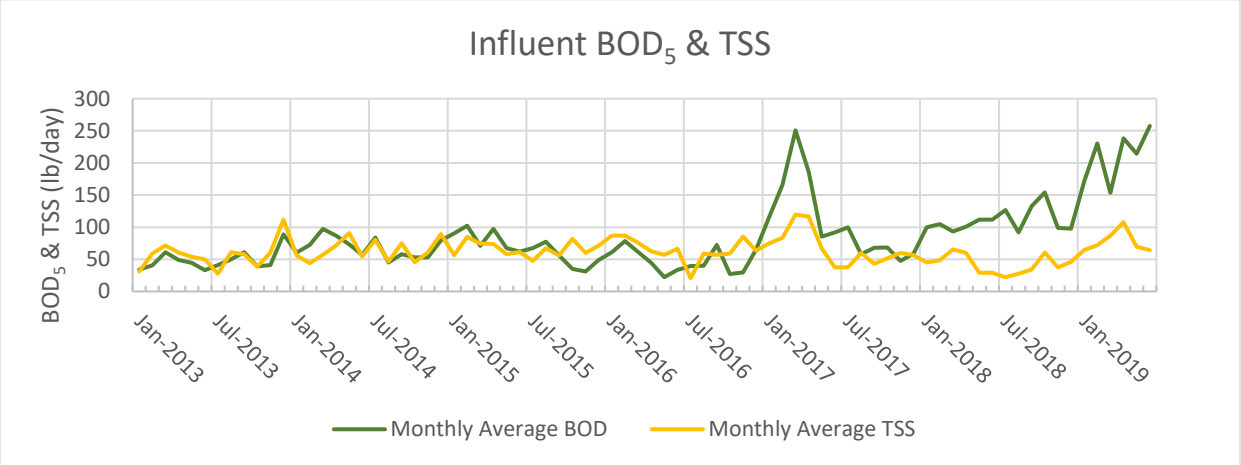
Peak Hour Flow

The Juliaetta WWTP does not currently have the capability of measuring the influent flows on an hourly basis or recording 24-hour flow patterns. A 24-hour flow pattern was developed in the *Lewiston Wastewater System Master* Plan (July 2018) that reflects a peak hour factor of 1.63. This would equate to a current peak hour flow of approximately 250 gpm. Using this peaking factor and the projected maximum day flow, the peak hour flow is projected to 333 gpm in 2039.

2.7.2 Influent BOD_5 & TSS

Influent BOD_5 and TSS concentrations are measured using weekly grab samples from the grit chamber outfall and recorded monthly in the DMR. The BOD_5 and TSS data from January 2013 through June 2019 is shown in pounds per day in **Figure 2.7.1**, **Table 2.7.7**, and **Table 2.7.8.** The data shows that BOD_5 and TSS loadings were similar until about January 2018, then BOD_5 levels began to climb significantly above TSS.

It is expected that the difference in BOD_5 and TSS shown in the recent DMRs does not accurately reflect the concentration of organics. Inconsistencies in the BOD_5 and TSS loading data may be due to accuracy limitations associated with grab sampling, poorly filtered distilled water, inaccurate lab equipment, or testing procedures. It is recommended that more reliable BOD_5 and TSS sampling methods be implemented prior to the design of any treatment improvements. For the purpose of establishing loadings for this plan, the data was refined by excluding the anomalies highlighted in **Tables 2.7.7 and 2.7.8** from the set. The adjusted data is shown in **Figure 2.7.2** and will be discussed in the remainder of this document.



Note: The data from March 2017 is unusually high and is assumed to be the result of I/I during a flood event.

Figure 2.7.1 – Monthly BOD_5 & TSS Loading (January 2013 – May 2019)

Table 2.7.7 – Monthly BOD_5 Data (2013-2019)

Month	Monthly BOD_5 (lbs/day)							
	2013	2014	2015	2016	2017	2018	2019	AVERAGE
Jan	34.2	60.5	90.3	60.8	116.2	99.9	171.1	90.4
Feb	40.4	72.5	102.2	78.4	165.5	104.6	230.1	113.4
Mar	60.8	97.3	70.9	61.6	250.8	93.5	153.3	112.6
Apr	49.0	86.8	97.1	44.4	186.5	100.6	238.2	114.7
May	44.5	73.4	67.5	22.2	85.2	111.7	214.1	88.4
Jun	32.9	57.2	62.0	33.6	91.6	111.7		64.8

Jul	41.1	83.9	67.5	39.8	99.7	126.6		76.4
Aug	49.8	45.2	77.5	40.0	57.8	91.9		60.4
Sep	60.8	58.1	56.0	72.3	67.9	132.5		74.6
Oct	39.2	52.9	35.0	27.0	68.2	154.0		62.7
Nov	40.9	52.8	31.1	29.7	47.4	98.7		50.1
Dec	88.9	79.5	48.8	65.3	58.9	97.6		73.2

= SIGNIFICANT OUTLIER EXCLUDED

= APPARENT OUTLIER EXCLUDED

Table 2.7.8 – Monthly TSS Data (2013-2019)

Month	Monthly TSS (lbs/day)							
	2013	2014	2015	2016	2017	2018	2019	AVERAGE
Jan	30.9	56.2	56.4	86.9	74.8	45.2	64.7	59.3
Feb	58.9	44.1	84.6	87.0	83.2	48.6	72.0	68.4
Mar	71.2	57.2	74.2	76.0	119.4	65.6	87.1	78.7
Apr	60.3	71.4	73.8	62.4	116.6	59.8	107.8	78.9
May	53.9	91.0	58.0	56.9	66.8	29.3	69.6	60.8
Jun	50.1	54.6	61.3	66.6	37.5	29.3		49.9
Jul	27.6	80.4	47.4	20.5	37.3	22.1		39.2
Aug	60.8	46.5	67.3	59.0	59.7	27.8		53.5
Sep	58.2	74.7	55.8	56.7	42.9	34.1		53.7
Oct	38.4	45.5	81.7	59.0	51.5	60.2		56.1
Nov	60.6	60.7	59.7	85.3	60.0	37.7		60.7
Dec	111.7	89.4	71.3	63.4	56.6	46.2		73.1

= SIGNIFICANT OUTLIER EXCLUDED

= APPARENT OUTLIER EXCLUDED

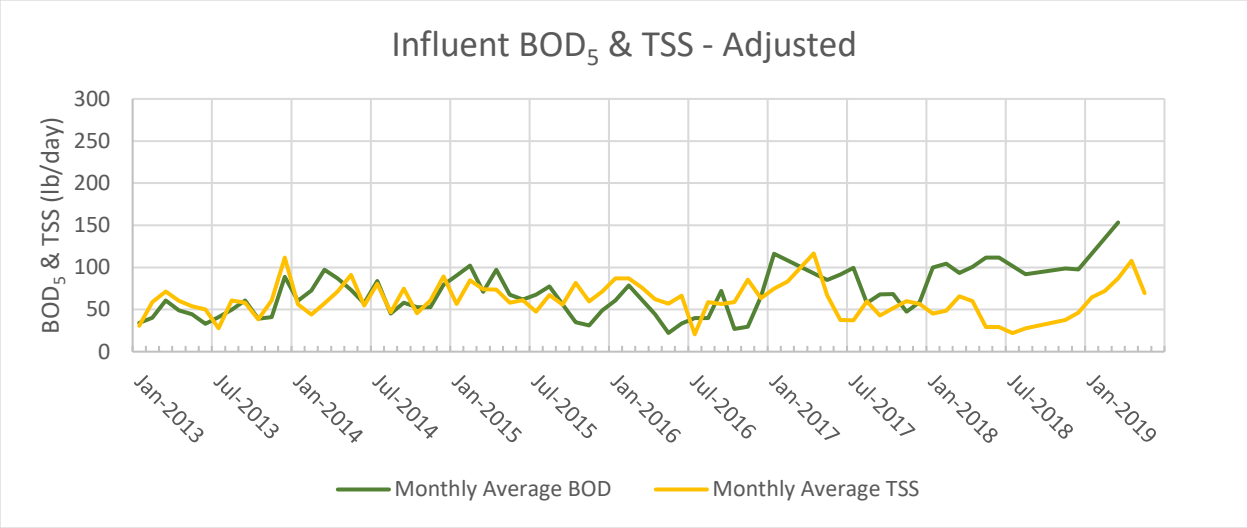


Figure 2.7.2 – Adjusted Monthly BOD_5 & TSS Loading (January 2013 – May 2019)

BOD_5 Loading

The average annual BOD_5 loadings from 2013 to 2019 are given in **Table 2.7.9**. These values range from 0.08 pounds per capita daily (ppcd) to 0.25 ppcd. Using the average value of 0.14 ppcd, the 2039 average BOD_5 loading was found to be 108.7 lb/day or a concentration of 227.1 mg/L.

Table 2.7.10 shows the maximum annual BOD_5 loadings from 2013 to 2019. These values range from 0.13 ppcd to 0.25 ppcd. The 2039 maximum BOD_5 loading was projected using the maximum value of 0.25 ppcd, which suggests a future loading of 202.8 lb/day or a concentration of 423.5 mg/L.

Table 2.7.9 – Average Annual BOD_5 Loading (2013-2019)

Year	BOD_5 Loading		
	ppcd	lb/day	mg/L
2013	0.08	48.5	162.6
2014	0.12	68.3	223.2
2015	0.12	67.2	244.6
2016	0.08	47.9	139.6
2017	0.13	77.0	268.4
2018	0.17	101.1	367.5
2019	0.25	153.3	489.6
Average	0.14	80.49	270.79
2039 Planning Criteria	0.14	108.7	227.1

Table 2.7.10 – Maximum Month BOD_5 Loading (2013-2019)

Year	BOD_5 Loading			Max Month
	ppcd	lb/day	mg/L	
2013	0.15	88.9	228.0	December
2014	0.17	97.3	298.0	March
2015	0.18	102.2	354.0	February

2016	0.13	78.4	228.0	February
2017	0.20	116.2	389.0	January
2018	0.19	111.7	548.0	May/June
2019	0.25	153.3	753.0	March
Maximum	0.25	153.34	753.00	
2039 Planning Criteria	0.25	202.8	423.5	

TSS Loading

The average annual TSS loadings from 2013 to 2019 are given in **Table 2.7.11**. These values range from 0.07 ppcd to 0.11 ppcd. Using the average value of 0.11 ppcd, the 2039 average TSS loading was found to be 84.8 lb/day or a concentration of 177.2 mg/L.

Table 2.7.12 shows the maximum annual TSS loadings from 2013 to 2019. These values range from 0.11 ppcd to 0.20 ppcd. The 2039 maximum TSS loading was projected using the maximum value of 0.20 ppcd, which suggests a future loading of 156.8 lb/day or a concentration of 327.5 mg/L.

Table 2.7.11 – Average Annual TSS Loading (2013-2019)

Year	TSS Loading		
	ppcd	lb/day	mg/L
2013	0.10	56.9	186.0
2014	0.11	64.3	216.1
2015	0.11	66.0	239.0
2016	0.11	65.0	192.4
2017	0.10	62.5	174.4
2018	0.07	42.2	129.8
2019	0.13	80.2	192.4
Average	0.11	62.43	190.02
2039 Planning Criteria	0.11	84.8	177.2

Table 2.7.12 – Max Month TSS Loading (2013-2019)

Year	TSS Loading			Max Month
	ppcd	lb/day	mg/L	
2013	0.19	111.7	223.0	December
2014	0.16	91.0	335.0	May
2015	0.15	84.6	299.0	February
2016	0.15	87.0	284.0	February
2017	0.20	116.6	237.0	April
2018	0.11	65.6	190.0	March
2019	0.18	107.8	284.0	April
Maximum	0.20	116.62	335.00	
2039 Planning Criteria	0.20	156.8	327.5	

2.7.3 Effluent Temperature

The Juliaetta WWTP is not currently equipped to measure temperature at the effluent outfall, and the most recent set of effluent temperature data as included in the NPDES Permit Fact Sheet is from 2006. This effluent data was used in conjunction with flow data for the Potlatch River near Little Bear Creek (USGS Station 13341570) for the months of October 2017 through September 2018 **(Figure 2.7.3)**. The

complete data set from the Potlatch River monitoring station is included in **Appendix H.** The minimum river flow for each month was used to conservatively estimate the maximum daily effluent temperature limits listed in **Table 3.4.1**. Then, the 2006 effluent temperatures were compared to the temperature limits for compliance (**Table 2.7.13**).

This comparison suggests that the effluent violation in July 1-15 may have been higher than the future daily effluent temperature limit. However, the WLA gives different temperature limits for early and late July, but only one value was given for the month of July 2006. It is likely that the average temperature in early July 2006 was lower than the average temperature for the entire month.

The analysis of effluent temperature data from 2006 is limited in its application to the current and future WWTP because the age of the data. It is only intended to provide a baseline comparison as a

reference to determine the severity of actions that may be required to comply with the WLA placed on effluent temperature.

The results of this comparison are mostly inconclusive, except that the effluent temperature is most likely to require temperature conditioning during hot summer months and may not require extreme treatment to meet the WLA requirements. As stated previously, it is recommended that the City begin continuous monitoring of effluent temperature to develop a more accurate understanding of future needs.

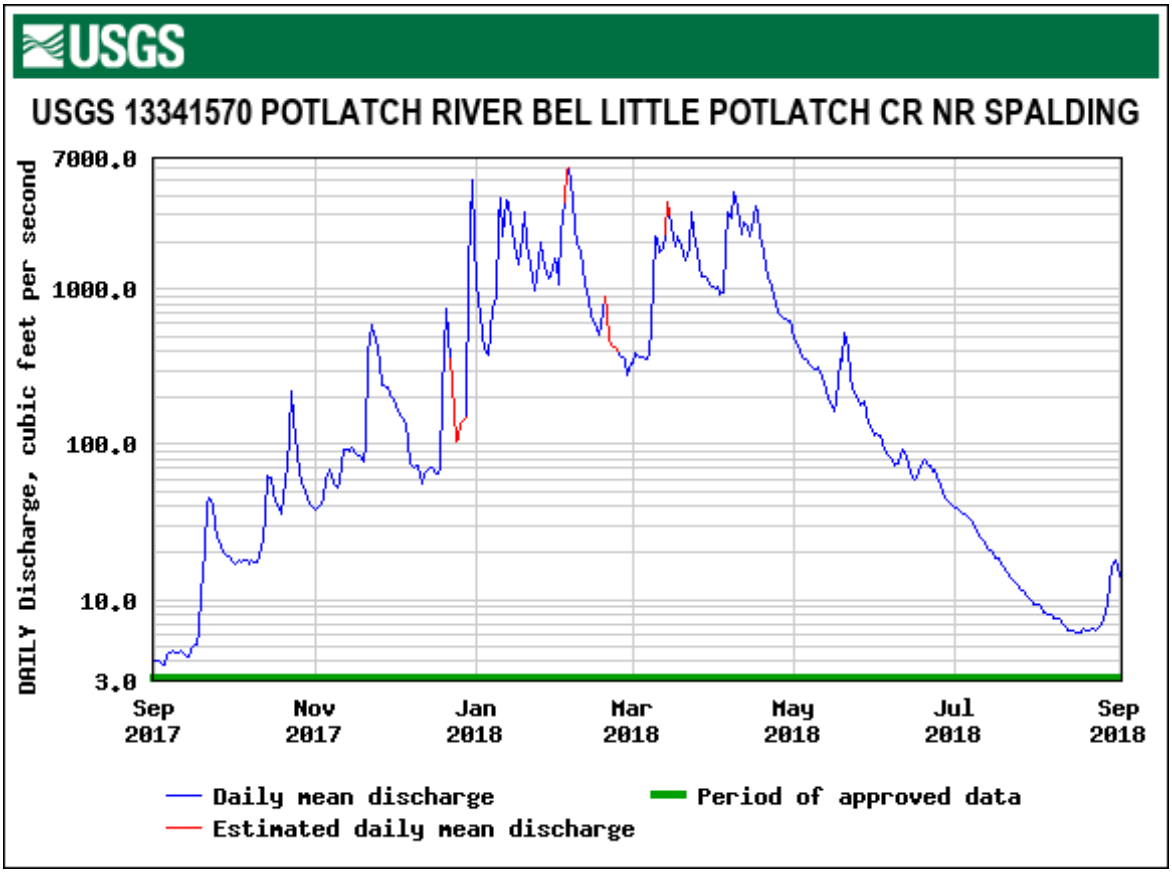


Figure 2.7.3 – Potlatch River Flow (Sept. 2017 – Sept. 2018)

Table 2.7.13 – Effluent Temperature Compliance Baseline Data				
Month	Min River Flow (cfs) (Oct '17- Sept '18)	2006 WWTP Effluent Temperature (˚C)	Max Daily Effluent Temp. Limit (˚C)	Compliant?
January	378	7.2	--	--
February	283	8.5	--	--
March	330	9.4	--	--
April	548	11.6	59.3	Y
May	115	13.5	59.3	Y
June	40.4	18.9	21.8	Y
July 1-15	19.5	21.2	14.3	N
July 16-31	9.24	21.2	21.8	Y
August	6.09	21.3	21.8	Y
September	9.03	20.5	21.8	Y
October	16.8	17.3	--	--
November	37.4	15.8	--	--
December	55.9	9.3	--	--

2.7.4 Planning Criteria Summary

The 2039 planning criteria for flow is summarized in **Table 2.7.14**, and BOD_5 and TSS are summarized in **Table 2.7.15**.

Table 2.7.14 – Summary of 2039 Planning Criteria (Flow)					
Design Population (2039)	Average Day Flow		Max Month Flow	Peak Day Flow	Peak Hour Flow
	gpcd	mgd	mgd	gpm	gpm
800	71.8	0.057	0.14	204	333

Table 2.7.15 – Summary of Planning Criteria (BOD_5 & TSS)							
BOD_5 Loading				TSS Loading			
ppcd	lb/day	mg/L	% Removal	ppcd	lb/day	mg/L	% Removal
0.25	202.8	423.5	85	0.20	156.8	327.5	85

Other criteria for WWTP planning are related to the reliability of unit processes, which generally relates to providing redundant equipment. For the highest level of reliability (Reliability Class I per EPA guidance, EPA 430-99-74-001), at least two units are required for screens, pumps, secondary clarifiers, aeration basins, blowers, and disinfection equipment. The EPA criteria also require that the capacity with the largest unit out of service be sufficient to provide for 75% of design flow through secondary clarifiers, peak flow through pumps, and design oxygen transfer through blowers.

A lift station is assumed to have sufficient capacity if it can convey peak hour flows with the largest pump out of service. Additionally, it is the municipality's responsibility to ensure that sanitary sewer overflows (SSOs) do not occur. Extended power outages may lead to wastewater backing up into homes and onto the streets. Mobile generators or portable trash pumps may be acceptable for lift stations,

depending on the risk of overflow, available storage in the wet well and pipelines, alarms, and response time.

The collection system is assessed by determining the available capacity in pipelines and lift stations. Based on the available capacity and expected growth in an area, improvements are suggested to increase the capacity as required to meet future infrastructure needs.

A gravity pipeline is generally assumed to have insufficient capacity if surcharging occurs during a peak hour flow condition. Surcharging refers to a condition when the flow in the pipe backs up into manholes and begins flowing under pressure. This condition presents an increased risk of wastewater backing up into people's homes, overflows, and the increased potential for exfiltration (escape of raw wastewater into groundwater). Based on discussions with City staff, no known surcharging is occurring in the system. Additional analysis will be needed to model and assess whether pipelines are sufficiently sized. See Sections 2.7.1, 4.1, and 8.1 for I & I Study recommendation, which should include modeling of the collection system.

There is a wide range of standards used to determine when a pipe is considered too full or over capacity. For the purposes of this plan two triggers were considered in prioritizing improvements:

- Areas that will likely experience growth – the need for capital improvements should be triggered when the pipe is at 75% of flow capacity with the goal to have new facilities in place by the time the existing pipelines reach 90% of capacity.
- Areas of limited growth capacity – as long as the interceptor flows are less than 90% capacity, and no historical problems have been observed, then no improvements would be recommended, however increased monitoring may be warranted.

Ongoing infiltration and inflow (I/I) reduction efforts along with installation of check valves in service lines that feed basements are additional measures the City could take to reduce the risk of pipe surcharging and sanitary sewer overflows (SSO).

In addition to capacity problems, other conditions may affect the effectiveness of the collection system. Providing minimum slopes that allow for scouring velocities is important to keep pipelines free from debris. Additionally, the condition of the pipe may affect pipeline capacity. Root intrusions, broken sections of pipeline, accumulation of fats, oil, and grease (FOG), and excessive debris can all affect the capacity of the pipelines.

CHAPTER 3 NEED FOR PROJECT

An evaluation of the existing system identified the following deficiencies: extensive corrosion of tanks, equipment, and the wet well; inadequate provisions for safety and access; lack of flow and temperature monitoring equipment; insufficient sludge handling storage; and mechanical equipment beyond its useful life and practical repair because replacement parts are no longer available on the market. Additionally, the existing treatment process needs adjustment to meet pH, and temperature requirements included in the City's NPDES permit.

A plan for mitigating these deficiencies and meeting future system requirements is needed.

3.1 Public Health, Sanitation, and Security

The health and sanitation of the Juliaetta community is impacted by the operation of the WWTP. Currently, there is not adequate redundancy for the lift station, preliminary treatment, aeration basin, clarifier, or microscreen. As such, these components cannot be taken offline to provide basic maintenance and repair. For example, the aeration basin and clarifier have not been emptied and cleaned since their construction 40 years ago. The lift station relies solely on one pump because the other is unreliable and has failed in the past. The WWTP is not equipped to provide wastewater treatment in the event that the single pump currently in use fails or must be removed for maintenance.

Other health, sanitation, and safety concerns include the lack of retrieval equipment/fall protection; undersized observation walkways; operator exposure to splashes when the grit chamber is drained; potential vector attraction to the sludge drying beds; and the unknown integrity of the severely corroded lift station, valves, and piping.

A key issue in Juliaetta's permit is the ability of the WWTP to meet effluent pH and temperature requirements, as discussed in the following section. Without adequate flow and temperature monitoring equipment, the operators are impeded from accurately assessing the needs of the WWTP and its compliance with the NPDES permit.

3.2 Aging Infrastructure

As stated above, the Juliaetta WWTP has not had any significant rehabilitation to the existing system since it was constructed in 1976. The major components of the system have been reviewed and analyzed in Chapter 2 of this report. Deficiencies and modifications were noted or referenced to with regards to regulations and recommendations provided by the DEQ, Ten State Standards, and IDAPA Wastewater Rules.

Components significantly affected by age include the lift station; comminutor; grit chamber, aeration, and clarifier tanks and associated piping; and microstrainer. Replacement parts are no longer available for the comminutor or the microstrainer due to their age. Additionally, the preliminary treatment equipment is not designed to handle modern plastic products and does not adequately remove grit and rags.

3.3 Reasonable Growth

As discussed in Chapter 2, the size and state of the equipment and facilities is not sufficient or reliable enough to support the expected future growth. Redundancy issues and outdated equipment must be resolved to allow for Juliaetta's future reasonable growth.

3.4 Compliance with State and Federal Regulations

The City's current NPDES permit became effective on August 1, 2018 and will expire on July 31, 2023. In September 2008, DEQ developed a TMDL for the Potlatch River, including the segment to which the City's WWTP discharges. The current permit includes effluent limitations, report parameters, new WLA's for TSS and Temperature, a compliance schedule for meeting temperature limits, and surface monitoring requirements.

Table 3.4.1 shows the effluent limitations and monitoring requirements in the WWTP's current permit which include limitations on BOD_5, TSS, *E. coli*, total residual chlorine, pH, and temperature. Report parameters in Table 3.4.1 include effluent flow, nitrate and nitrite, total ammonia as nitrogen, and total phosphorus. Limitations for these reporting parameters may be included in the WWTP's NPDES permit in the future. The maximum effluent temperature limit in the current permit varies throughout the year and is determined according to **Table 3.4.2** based on the flow in the Potlatch River, WWTP effluent flow, and the seasons for salmonoid spawning and incubation and cold-water aquatic life. The compliance schedule for final temperature effluent limits is given in **Table 3.4.3.**

Additionally, the NPDES permit spells out requirements for surface water monitoring in the Potlatch River upstream of the WWTP. Beginning by January 31, 2019, samples must be analyzed for the parameters listed in **Table 3.4.4**. The permit notes that "temperature data must be recorded using a micro-recording temperature device known as a thermistor" at 1-hour intervals and report the monthly instantaneous maximum, maximum daily average, and seven-day running average in the monthly Discharge Monitoring Report (DMR).

Table 3.4.1 – 2018 NPDES Permit Effluent Limitations And Monitoring Requirements							
Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Parameters with Effluent Limits							
BOD_5	mg/L	30	45	--	Influent & Effluent	1/month	Grab
	ppd	20	30	--			Calculation
	% removal	85 (minimum)	--	--	--	1/month	Calculation
TSS	mg/L	30	--	--	Influent & Effluent	2/month	Grab
	ppd	18	--	--			Calculation
	% removal	85 (minimum)	--	--	--	1/month	Calculation
E. coli	CFU/100 mL	126	--	406 (instant max)	Effluent	5/month	Grab
Total Residual Chlorine	µg/L	12	--	21	Effluent	1/week	Grab
	lb/day	0.0080	--	0.014			Calculation
pH	std units	Between 6.5 - 9.0			Effluent	1/week	Grab
Temperature (until July 31, 2019)	˚C	See Table 1.7.2			Effluent	1/week	Grab
Temperature (beginning August 1, 2019)	˚C	See Table 1.7.2			Effluent	Continuous	Recording
Report Parameters							
Flow	mgd	Report	--	Report	Effluent	Continuous	Measurement
Nitrate & Nitrite	mg/L	Report	--	Report	Effluent	1/quarter	Grab
Total Ammonia as N	mg/L	Report	--	Report	Effluent	1/quarter	Grab
Total Phosphorus	mg/L	Report	--	Report	Effluent	1/quarter	Grab

Table 3.4.2 – Maximum Daily Effluent Temperature Limits (°C)					
April 1 - July 15 (Spawning and Incubation)					
Stream Flow (cfs)	WWTP Flow (MGD)				
	≤ 0.0064	> 0.0064 - 0.045	> 0.045 - 0.097	> 0.097 - 0.15	> 0.15
< 2	16.8˚C	10.4˚C	9.8˚C	9.6˚C	9.6˚C
2 - < 5	24.3˚C	11.4˚C	10.3˚C	10˚C	9.8˚C
5 - < 10	46.8˚C	14.7˚C	11.8˚C	10.9˚C	10.6˚C
10 - < 25	84.3˚C	20˚C	14.3˚C	12.6˚C	11.8˚C
25 - < 50	--	36.1˚C	21.8˚C	17.5˚C	15.6˚C
50 - < 100	--	62.9˚C	34.3˚C	25.6˚C	21.8˚C
≥ 100	--	--	59.3˚C	41.9˚C	34.3˚C
July 16 - Sept 30 (Cold Water Aquatic Life)					
Stream Flow (cfs)	WWTP Flow (MGD)				
	≤ 0.0064	> 0.0064 - 0.045	> 0.045 - 0.097	> 0.097 - 0.15	> 0.15
< 2	26.8˚C	20.4˚C	19.8˚C	19.6˚C	19.6˚C
2 - < 5	34.3˚C	21.4˚C	20.3˚C	20˚C	19.8˚C
5 - < 10	56.8˚C	24.7˚C	21.8˚C	20.9˚C	20.6˚C
10 - < 25	94.3˚C	30˚C	24.3˚C	22.6˚C	21.8˚C
25 - < 50	--	46.1˚C	31.8˚C	27.5˚C	25.6˚C
50 - < 100	--	72.9˚C	44.3˚C	35.6˚C	31.8˚C
≥ 100	--	--	69.3˚C	51.9˚C	44.3˚C

Table 3.4.3 – Compliance Schedule for Final Temperatures Effluent Limits	
Date	Compliance Action
August 1, 2018	All effluent limitations and monitoring requirements except the effluent limitations for temperature which are less than 21.3 ˚C
July 31, 2019	Submit progress reports on the evaluation of alternatives to EPA & DEQ
July 31, 2020	Submit progress reports on the evaluation of alternatives to EPA & DEQ
July 31, 2021	Complete and submit an evaluation of alternatives to EPA & DEQ
July 31, 2022	Submit Report of Progress to EPA & DEQ
July 31, 2023	Submit Report of Progress to EPA & DEQ
July 31, 2024	Submit Report of Progress to EPA & DEQ
July 31, 2025	Submit Report of Progress to EPA & DEQ
July 30, 2027	Submit final design of facility upgrades and/or alternative mitigation plan to EPA & DEQ to address effluent temperature limits
July 31, 2029	Submit written notification to EPA & DEQ that facility upgrades have been completed and/or an alternative temperature mitigation plan has been implemented
July 31, 2031	The City must be compliant with the final effluent limits for temperature

Table 3.4.4 – Surface Water Monitoring Requirements			
Parameter	Units	Frequency	Sample Type
Nitrate & Nitrite	mg/L	1/quarter	Grab
Total Ammonia as N	mg/L	1/quarter	Grab
Total Phosphorus	mg/L	1/quarter	Grab
Temperature	˚C	Continuous	Recording
pH	std units	1/quarter	Grab

Since 2013, the City of Juliaetta's WWTP has experienced seven effluent violations, as shown in **Table 3.4.5**.

Table 3.4.5 – Summary of Effluent Violations Since 2013			
Monitoring Period	Limit Description	Reported Value	NPDES Limit
July 2013	pH	6.0	6.5 min
July 2013	Chlorine, total residual	0.5 lb/day	0.1 lb/day
August 2013	pH	6.3	6.5 min
October 2013	pH	6.4	6.5 min
October 2013	TSS	82% removed	85% min
July 2015	pH	6.4	6.5 min
August 2015	pH	6.3	6.5 min

Other violations since 2013 include DMR non-receipt violations in March 2014; September 2015; and August, September, and December 2018. The most common instance of permit violation is reporting a pH below the minimum of 6.5. Graphs of the effluent data are included in section 2.4.

As the WWTP continues to age, the City also faces an increased likelihood of system failures and corresponding compliance violations.

CHAPTER 4 COLLECTION SYSTEM ALTERNATIVES

4.1 Description of Collection System Projects

As discussed in section 1.3 of this document, the City expect future population growth to the north and south of City limits. Improvements to the City's existing gravity sewer system will be required to connect and serve these areas. Projects 4a and 4b described below are population-driven and should be implemented based on the regions and rate of the City's growth. Additionally, it is recommended that the City continue to assess potential areas of infiltration and inflow as described in Project 5 below.

Project 1 - Upgrade Existing 10" Main

The existing 10" sewer main is located beneath the Ed Corkill Memorial River Trail, a pedestrian and bike route connecting the cities of Juliaetta and Kendrick. The line runs from 4th Street down to the WWTP lift station and is currently undersized for expected population growth. The purpose of Alternative 1 is to increase the size of the existing line, and includes removing the existing 10" gravity sewer pipe, installing a new 12" line, replacing the associated manholes, and providing surface repair on the trail.

Project 2 - Northeast Expansion

This project would connect neighborhoods on the North Juliaetta Grade to the existing sewer system. Expansion in this area would require boring under the Potlatch River to install a new 8" line. The City is already planning to bore in this area to install a water line and will preemptively install a 12" casing for the future sewer line.

Project 3 - Northwest Expansion

A new 8" sewer line and four manholes would connect the existing neighborhood along Middle Potlatch Creek Road. This project would serve the area north of City limits and west of Highway 3 where future expansion is expected.

Project 4a - Southwest Expansion

Projects to serve the expected expansion areas to the south of City limits were considered on either side of Highway 3. An 8" sewer line would serve this area, which requires boring below the highway, the installation of six manholes, and the construction of a new lift station and wet well.

Project 4b - Southeast Expansion

Similarly, connecting the area to the southeast of City limits would require the installation of a new sewer service line. The Southeast Expansion project consists of the placement of a new 8" sewer line, boring under Highway 3, the installation of three manholes, and the construction of a new lift station and wet well.

Project 5 – I & I Analysis & Collection System Study

As discussed in Section 2.7.1 of this document, it is recommended that the City conduct additional analysis on the collection system including influent and collection system flow monitoring, collection system TV inspection and smoke testing, collection system conditions assessments, and evaluation of recommended repairs. This evaluation should include hydraulic modeling of the system.

4.2 Design Criteria

The hydraulic planning criteria for the collection system is included in section 2.7 of this document. Additional design criteria for wastewater pipelines are included the IDAPA Wastewater Rules and the Ten State Standards, which include recommendations for minimum pipe sizes, bury depth, slope, materials, and installation.

4.3 Schematic Layout Map

Site plans and schematic drawings are included with the detailed cost estimates in **Appendix L**. See also Figure 4 – Collection System Master Plan in **Appendix A**.

4.4 Environmental Impacts

A summary of the preliminary environmental screening of the Collection System Projects is illustrated in **Table 4.4.1.** For the purpose of this screening, the alternatives considered were Alternative 1 – Status Quo, and Alternative 2 – Complete Collection System Projects 1-4.

Table 4.4.1 – Environmental Impacts of Collection System Projects

Environmental Criteria	Alternative 1	Alternative 2
	Status Quo	Complete Collection System Projects
Climate / Physical Aspects (topography/geology/and soils)	No impact	No permanent adverse impacts
Population, Economic, and Social Profile	Uncorrected deficiencies will jeopardize the City's economic options in the future	Will provide additional system capacity to support development
Land Use	Reduced capacity for future development, potential moratorium condition	Will increase land use opportunities
Floodplain Development	No impact	No impact
Wetlands and Water Quality	No adverse impact	No adverse impact
Wild and Scenic Rivers	No impact	No adverse impact
Cultural Resources	No impact	Impact unlikely because construction will be in previously disturbed land
Flora & Fauna	No impact	No adverse impact
Recreation/Open Space	No impact	No adverse impact
Agricultural Lands	No impact	No adverse impact
Air Quality	No impact	No adverse impact
Energy	No impact	No adverse impact
Public Health	Public health risk from existing uncorrected deficiencies	Positive long-term impact on City's ability to provide wastewater service

4.5 Land Requirements

The majority of proposed collection system projects will take place on previously-disturbed land where other City utilities are already present. As such, it is not expected that new easements, leases, or access agreements will be required to complete these projects.

4.6 Potential Construction Problems

Potential construction problems include maintaining services during construction, potential bypass pumping, manhole replacement, potential AC pipe removal, pipe boring across river. The relevant issues are noted for each project in the Collection System CIP included in **Appendix L**.

4.7 Sustainability Considerations

Two of the proposed collection system projects will require a lift station to serve the expansion areas. These lift stations will feature energy efficient pumps fitted with VFD's. Additional discussion of sustainability considerations is included in Chapter 8.

CHAPTER 5 WASTEWATER TREATMENT ALTERNATIVES

5.1 Design Criteria

The planning criteria related to hydraulic loading and permit requirements are included in Chapter 2 of this document.

Besides meeting permit requirements, any discussion of alternatives for the Juliaetta WWTP ought to consider the availability of qualified operators, general operation and maintenance, land availability, community needs, and projected population growth. These factors lead to the dismissal of many alternatives presented in this document. Additional design criteria include redundancy for maintenance and emergency situations, and compliance with the Ten State Standards and IDAPA Wastewater Rules.

5.2 Schematic Layout Map

Site plans and schematic drawings are included with the detailed cost estimates in **Appendix L**.

5.3 Environmental Impacts

A summary of the preliminary screening of the environmental impact of these alternatives is included in this chapter following the discussion of each respective component.

5.4 Land Requirements

No additional land is required for the WWTP alternatives listed in Chapter 5.

5.5 Potential Construction Problems

Potential construction problems for the improvements at the wastewater treatment plant include maintaining treatment services during construction and site constraints.

5.6 Sustainability Considerations

The lift station will feature energy efficient pumps fitted with VFD's. Additional discussion of sustainability considerations is included in Chapter 8.

5.7 Capital and Life-Cycle Costs

The capital and life-cycle costs for each alternative are included in **Chapter 7** and **Appendix L**.

5.8 Temperature Compliance

As previously mentioned, the magnitude of effluent temperature mitigation necessary to comply with the City's NPDES permit cannot be determined until adequate effluent temperature data is obtained. City operators plan to install temperature monitoring probes in Summer 2020. Methods to reduce or eliminate thermal impacts from the WWTP discharge may be required at all times, only during part of the year, or not at all. The potential alternatives listed below should be revisited to determine a solution once appropriate effluent temperature data has been collected and analyzed. It is anticipated that data will be ready to evaluate by Summer 2021.

A temperature limit has also been included in the discharge permit for the City of Kendrick, just north of Juliaetta. The two cities have discussed whether a regional solution may be employed to meet these limits; however, a joint solution is likely not the most favorable option for the City of Juliaetta. Any of the alternatives included in this section could be also employed in a regional approach, and the possibility of a regional solution for temperature reduction may be readdressed once the City has a better understanding of the needs of their WWTP.

The Juliaetta drinking water treatment facility also discharges to the Potlatch River and is not currently under an NPDES permit. The drinking water facility has an estimated design flow of 0.0069 mgd and was included in the 2018 TMDL WLA for temperature. To comply with the WLA placed on the drinking water facility, the City may also want to consider treating the discharged drinking water using a cooling method located at the WWTP.

The following is a summary of various methods and technologies available to mitigate effluent temperature. Multiple approaches may be employed cocurrently to satisfy the permit limit.

Alternative 1 - Effluent Reuse

Instead of thermally treating the effluent before disposal, all or a portion of the treated wastewater could be reused. Typical reuse applications include land application (irrigation), industrial use, groundwater recharge, recreational use, environmental enhancement, and non-potable uses such as fire suppression, dust control, and toilet flushing. Effluent reuse is strictly regulated and requires a special permit from the DEQ. Often, reclaimed wastewater is stored to supplement off-peak flows at the reuse site. It is important to note that any reclaimed water discharged to the Potlatch River after reuse must still meet the temperature permit requirements.

The Class or level of treatment of the effluent is determined by IDAPA Recycled Water Rules 58.01.17 (see **Appendix K** for a summary of Class requirements for water reuse). A Class C effluent is produced at the Juliaetta's WWTP, which may be used for irrigating commercial timber, processed food crops, and animal pasture. One potential opportunity in Juliaetta would be reusing the effluent as process water at the Stella Jones pole yard. The alternative of effluent reuse should be revisited and considered once effluent temperature data has been acquired from the WWTP.

Alternative 2 - Seasonal Storage

One method to avoid adverse thermal impacts on the receiving water is to temporarily store the treated effluent during the critical temperature period and release it when the streamflow has increased, or the wastewater temperature has decreased. Based on the analysis in Chapter 3, this period may be about 15 to 60 days during the summer months. A seasonal storage basin could be either open or covered. It should also be equipped with aeration equipment to combat low dissolved oxygen, excessive algal and phytoplankton growth, and deterioration of water quality.

Alternative 3 - Alternative Discharge Location

The Potlatch River is adjacent to the east of the Juliaetta WWTP. There are no other bodies of water in the vicinity of the City, and the Potlatch River makes for a suitable receiving water for the wastewater discharge because of the river's large flows and close proximity. The WWTP currently discharges to a slough just south of the WWTP site.

Although there are no alternative receiving waters for effluent discharge, rapid infiltration systems may be employed as a method of effluent disposal. This method relies on native soils with a high coefficient

of permeability (sands and gravels). An analysis of this alternative would involve selecting a suitable location for two or more rapid infiltration cells, a geotechnical analysis of the native soil materials, and a consideration of winter and freezing conditions in design.

Alternative 4 - Constructed Wetlands

Using a constructed wetland as the initial receiving water is a method of offsite effluent mitigation that has been shown to reduce chemical oxygen demand and dissolved organic carbon in wastewater. However, there is little empirical data to substantiate the method for consistent and reliable effluent cooling. Due to uncertainty, a constructed wetland is not recommended for Juliaetta.

Alternative 5 - Effluent Blending

Another method to decrease the temperature of treated effluent is to mix it with colder groundwater or surface water before discharge. The cooling water would be pumped into a mixing basin, discharge pipe, or the receiving waters themselves, and be provided with sufficient agitation and mixing time to reach a uniform temperature. Although effluent blending is theoretically possible, it is not a suitable solution for Juliaetta because the City does not have excess water to use for mixing, and permitting could be difficult.

Alternative 6 - Mechanical Cooling

Mechanical chillers provide direct cooling using a liquid refrigerant, an evaporator, a compressor, and a condenser. This cooling method does not rely on evaporation, so chillers are reliable in any climate and are ideal for applications where the temperature limit is significantly below wet-bulb temperature. Chillers have rather high capital and operating costs but provide precise and reliable temperature control. They can be purchased in off-the-shelf units with a relatively small footprint. When adequate temperature data has been collected from the WWTP effluent, the possibility of using a cooling tower in tandem with a mechanical chiller to reduce operation and maintenance and energy costs should be investigated.

5.9 Lift Station

An efficient lift station is critical to the WWTP operations because it determines the hydraulic loading on extended aeration and other sensitive downstream treatment processes. The effectiveness of these processes is reduced if the hydraulic loading is not controlled.

Alternatives for the lift station include the “do nothing” or “status quo” option, an improved suction lift pump station, and a submersible lift station. Design criteria laid out in the Ten State Standards, the IDAPA Wastewater Rules, and the DEQ include suitable access for maintenance personnel, permanently installed ventilation, protection of valving and mechanical equipment, and provisions for equipment removal.

One improvement common to all alternative designs for the lift station (excepting the Status Quo) is to incorporate flow monitoring equipment to retrieve accurate influent flow data.

Alternative 1 - Status Quo

As previously discussed, the lift station at the Juliaetta WWTP is experiencing corrosion, grease build-up, and issues with pump priming. Additionally, flow monitoring and access for operation and maintenance

are hazardous. The lift station is not suitable for future use in its present state and requires equipment and component upgrades to comply with IDAPA requirements.

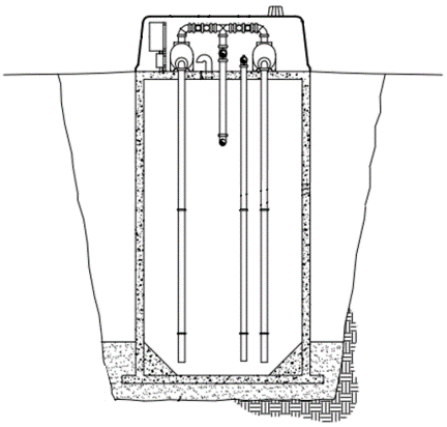
Alternative 2 - Suction Lift Pump Station

In a suction lift station (**Figure 5.9.1**), a vertical suction pump at finished grade level raises wastewater up and out of the wet well. This type of pump may be self-priming or primed with a small vacuum pump. The pump, valves, and control panel are above grade and isolated from the wet well to avoid the corrosive sewer environment. This type of lift station is currently in use at the Juliaetta WWTP.

With proper upgrades, a suction lift pump station could be a sufficient solution. These upgrades include new vertical suction pumps, improved access to and safety provisions in the wet well, and updated flow monitoring equipment.

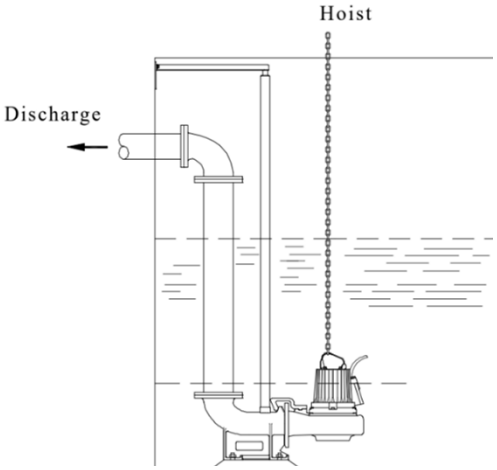
Alternative 3 - Submersible Pump Lift Station

Submersible pump lift stations use sealed pumps that operate below the wastewater surface. With this type of lift station, the header piping, valving, and flow meters are accessible from an above-grade dry vault. A submersible lift station typically has lower capital costs than a dry well lift station because they do not include large aboveground structures. They also tend to have a smaller footprint and be less conspicuous than a dry well lift station. The submersible pump is not as easy to access, but typically can be removed using a guard rail and hoist system. **Figure 5.9.2** shows an example of a submersible lift station.



Louisiana State University. *Design of Lift Station and Wastewater Treatment Facility*.

Figures 5.9.1 – Suction Lift Pump



US Environmental Protection Agency. *Collections Systems Technology Fact Sheet: Sewers, Lift Station*. September 2000.

Figures 5.9.2 – Submersible Lift Station

Alternative 4 - Submersible Pump Lift Station

Another alternative would be to rehabilitate the existing lift station. This option would involve applying a new coating to the interior of the existing wet well, installing two new end suction pumps, updating the electrical wiring and safety provisions. This alternative is similar to Alternative 2, but does not require the construction of a new wet well.

Table 5.9.1 – Environmental Impacts of Lift Station Alternatives				
Environmental Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Status Quo	New Suction Lift Pump Station	New Submersible Lift Station	New Suction Lift Pumps & Lift Station Coating
Climate / Physical Aspects (topography/geology/and soils)	No impact	No permanent adverse impacts	No permanent adverse impacts	No permanent adverse impacts
Population, Economic, and Social Profile	Uncorrected deficiencies increase maintenance costs, potential for emergencies, and opportunity for permit violations	Will provide additional system capacity to support development	Will provide additional system capacity to support development	Will provide additional system capacity to support development
Land Use	Reduced capacity for future development, potential moratorium condition	Will increase land use opportunities	Will increase land use opportunities	Will increase land use opportunities
Floodplain Development	No impact	No impact	No impact	No impact
Wetlands and Water Quality	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact	No adverse impact
Wild and Scenic Rivers	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact	No adverse impact
Cultural Resources	No impact	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land
Flora & Fauna	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of Potlatch River fish habitat	No adverse impact	No adverse impact	No adverse impact
Recreation/Open Space	No impact	No adverse impact	No adverse impact	No adverse impact
Agricultural Lands	No impact	No adverse impact	No adverse impact	No adverse impact
Air Quality	No impact	No adverse impact	No adverse impact	No adverse impact
Energy	No impact	No adverse impact	No adverse impact	No adverse impact
Public Health	Public health risk from existing uncorrected deficiencies	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service

5.10 Preliminary Waste Treatment

The purpose of preliminary treatment is to remove wastewater constituents, including paper, rags, gravel and grit, which could damage or interfere with subsequent treatment processes or equipment. Preliminary treatment is necessary to protect and preserve the operation of downstream treatment components, and its design is dependent on the type of primary wastewater treatment in use.

Alternatives for preliminary treatment include the "status quo," coarse screening and grit removal for variations of activated sludge treatment, and more stringent screening and grit removal for use with an MBR system. Requirements for clear openings in bar screens, fine screen openings, grit removal, and other relevant design criteria are included in the Ten State Standards and IDAPA Wastewater Rules.

Alternative 1 - Status Quo

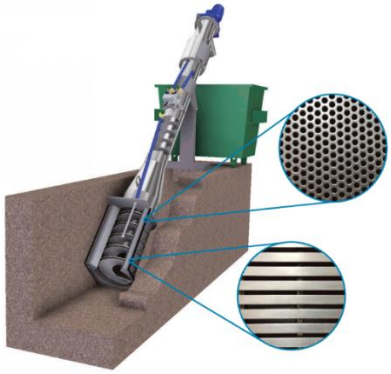
The existing preliminary treatment consists of a grit chamber and comminutor with a manually-cleaned bar screen bypass. As discussed in Chapter 2, the comminutor is frequently taken offline for maintenance. Damage observed on the comminutor is suspected to be caused by poor grit removal, and replacement parts for the comminutor are no longer available on the market. In addition to concerns regarding the reliability, longevity, and performance of the status quo, the operator is exposed to hazardous materials while emptying the grit chamber.

Alternative 2 - Grit Removal & Coarse Screen

A grit removal system and coarse screen would be a suitable option for use with most secondary treatment alternatives, with the exception of an MBR system. An example of a grit removal and coarse screen headworks is shown in **Figure 5.10.1**. The headworks system shown removes grit using a coarsely perforated helical archimedes screw.

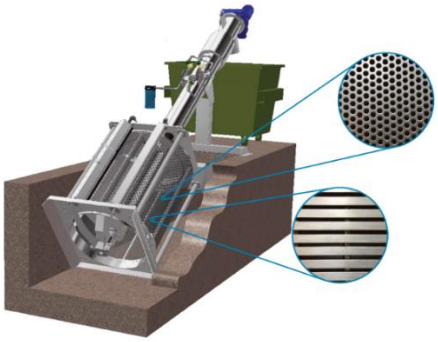
Alternative 3 - Grit Removal, Coarse & Fine Screens

If an MBR system is selected for secondary treatment, the requirements for the headworks are more stringent to protect the MBR equipment and reduce the chance of fouling. In this case, a headworks system with both coarse and fine screening would provide adequate grit removal. An example of this type of grit removal system is shown in **Figure 5.10.2**.



Lakeside Equipment Corporation. *Raptor Micro Strainer*.

Figure 5.10.1 – Grit Removal & Coarse Screen



Lakeside Equipment Corporation. *Raptor Rotating Drum Screen*.

Figure 5.10.2 –Grit Removal, Coarse & Fine Screens

Table 5.10.1 – Environmental Impacts of Preliminary Treatment Alternatives			
Environmental Criteria	Alternative 1	Alternative 2	Alternative 3
	Status Quo	Grit Removal & Coarse Screen	Grit Removal, Coarse, & Fine Screens
Climate / Physical Aspects (topography/geology/and soils)	No impact	No permanent adverse impacts	No permanent adverse impacts
Population, Economic, and Social Profile	Uncorrected deficiencies increase maintenance costs, potential for emergencies, and opportunity for permit violations	Will provide additional system capacity to support development	Will provide additional system capacity to support development
Land Use	Reduced capacity for future development, potential moratorium condition	Will increase land use opportunities	Will increase land use opportunities
Floodplain Development	No impact	No impact	No impact
Wetlands and Water Quality	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact
Wild and Scenic Rivers	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact
Cultural Resources	No impact	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land
Flora & Fauna	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River fish habitat	No adverse impact	No adverse impact
Recreation/Open Space	No impact	No adverse impact	No adverse impact
Agricultural Lands	No impact	No adverse impact	No adverse impact
Air Quality	No impact	No adverse impact	No adverse impact
Energy	No impact	No adverse impact	No adverse impact
Public Health	Public health risk from existing uncorrected deficiencies	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service

5.11 Secondary Wastewater Treatment

Secondary wastewater treatment involves the removal of biodegradable organic matter and suspended solids by biological and chemical processes. A number of methods may be used for secondary treatment including membrane bioreactors and variations on the activated sludge process. The efficiency of secondary wastewater treatment at the Juliaetta WWTP is critical to meeting effluent limitations in the NPDES permit and will impact the selection of downstream processes for sludge treatment and disposal, effluent disinfection, and effluent discharge.

Alternative 1 - Status Quo

The existing extended aeration infrastructure requires upgrades. Despite the operator's best efforts to extend the longevity of the treatment process equipment, it is beyond its useful life and is falling into disrepair. Both the aeration basin and the clarifier are over 40 years old. The surface of the tanks and several pipe connections show significant corrosion, which may indicate deeper damage to the materials.

Alternative 2 - Improved Extended Aeration

The extended aeration process is a variation of the activated sludge process which includes provisions for aeration and mixing, settling (in the clarifier), return of activated sludge, and solids removal (**Figure 5.11.1**). This process is commonly used in package plants for small communities and is currently in use at the Juliaetta WWTP.

Following preliminary treatment to screen and settle out solids, the wastewater that enters the aeration basin primarily contains suspended solids that consist of organic matter. The aeration basin influent is mixed with air or oxygenated to sustain the reaction of microorganisms "feeding" on the organic matter in the wastewater. Next, the wastewater flows into the clarifier, where the microorganisms settle to the bottom of the clarifier to form a sludge. Most of the sludge, called returned activated sludge (RAS), is sent back to the aeration tank to be reused in the aeration process. The remaining waste activated sludge (WAS) is removed from the system for disposal.

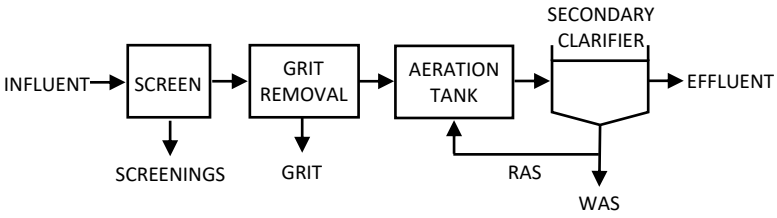


Figure 5.11.1 – Extended Aeration Process

A new extended aeration package system would have improved aeration and clarifier tanks, updated air diffusing equipment, and more efficient RAS and WAS piping systems. The City may choose to salvage and reuse some of the equipment already in use at the site (such as the air compressors).

Alternative 3 - Oxidation Ditches

Another modification of the activated sludge biological treatment process is an oxidation ditch (**Figure 5.11.2**). This process uses long solids retention times (SRTs) to remove biodegradable organics. Typical oxidation ditch systems are complete mix and consist of a single or multi-channel configuration, although they may be modified to approach plug-flow conditions. The incoming wastewater is mixed with RAS from a secondary clarifier. The mixed liquor is circulated using brushes, rotors, or other surface aerators. The mechanical aeration devices introduce oxygen into the system, move the mixed liquor

through the oxidation ditch, and keep organics suspended. The oxidation ditch effluent is settled in a secondary clarifier before the wastewater is disinfected and discharged.

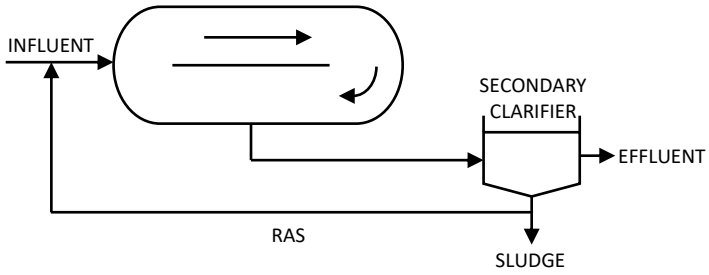
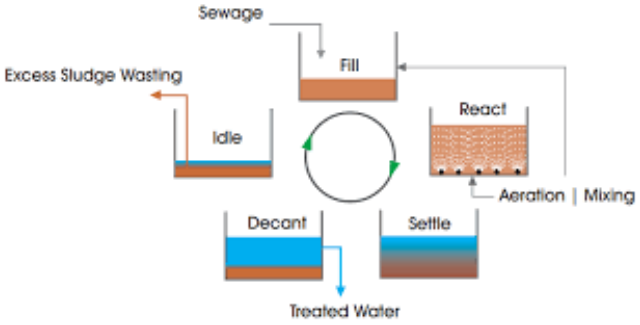


Figure 5.11.2 – Oxidation Ditch Process

Oxidation ditches have proven very effective in small communities. Although they have a larger footprint than conventional treatment facilities, the Juliaetta WWTP site has adequate space to accommodate an oxidation ditch. Advantages include similar sludge production as the existing process, low operational requirements, low maintenance costs, and minimal impact of shock loadings on the biological process.

Alternative 4 - Sequencing Batch Reactors

A sequencing batch reactors (SBR) is a fill-and-draw activated sludge system that can achieve equalization, biological treatment, and secondary clarification within a single tank. The typical treatment cycle within an SBR consists of several steps: 1) anoxic fill, 2) aerated fill, 3) a react cycle, 4) solids settling, 5) decant cycle, and 6) idle (wasting cycle), as depicted in (**Figure 5.11.3**). Typically, at least two basins are used for municipal wastewater treatment so that one basin can fill while the other goes through the react, solids settling, and effluent withdrawal cycle.



Ethics Infinity PVT Ltd. *Sequencing Batch Reactors (SBR)*. www.ethicsinfinity.com

Figure 5.11.3 – SBR Process

SBRs are suitable for use at low-flow wastewater treatment applications. They are also adaptable to permitting changes with regards to phosphorus and nitrification. Design criteria for an SBR system would be governed by the Ten State Standards including chapters 50, 60, 80, and 90, which address screening, sludge handling and removal, plant design, and the overall treatment design.

Advantages of an SBR system include operator flexibility and control and small tank footprint. Disadvantages include a higher level of technical system requirements than conventional systems, more sophisticated controls, potential plugging of aeration devices, and potential requirement for equalization to mitigate influent surge loadings or to prepare effluent for downstream processes.

Alternative 5 - Membrane Bioreactors

Microfiltration membrane bioreactors (MBRs) treat wastewater with the same principles as the conventional activated sludge process but combines a suspended growth biological reactor with solids removal via filtration. In this type of system (**Figure 5.11.4**), solids-liquid separating is achieved by passing wastewater through a thin porous membrane instead of the conventional gravity solids settling. The membranes are typically submerged in the activated sludge reactor but can also be placed in a separate stand-alone reactor. This process allows MBRs to operate at a higher mixed liquor suspended solids (MLSS) concentration than a conventional system. The permeate that passes through the

membrane typically has low concentrations of bacteria, TSS, BOD, and phosphorus, and are readily discharged to surface streams without the need for secondary clarification or tertiary filtration.

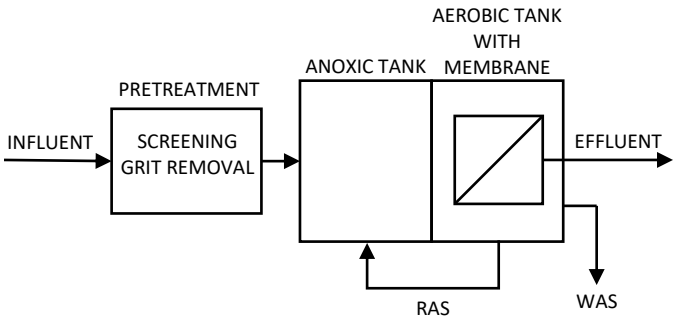


Figure 5.11.4 – MBR Schematic

MBR systems typically have higher capital and operation and maintenance costs than conventional systems. The key to a manageable life-cycle cost is maintaining the membrane to prolong its life. A high level of debris removal through preliminary treatment is required to prevent fouling and to lengthen the life of the membrane.

Table 5.11.1 – Environmental Impacts of Secondary Wastewater Treatment Alternatives					
Environmental Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	Status Quo	Imroved Extended Aeration	Oxidation Ditches	Sequencing Batch Reactors	Membrane Bioreacrors
Climate / Physical Aspects (topography / geology / and soils)	No impact	No permanent adverse impacts	No permanent adverse impacts	No permanent adverse impacts	No permanent adverse impacts
Population, Economic, and Social Profile	Uncorrected deficiencies increase maintenance costs, potential for emergencies, and opportunity for permit violations	Will provide additional system capacity to support development	Will provide additional system capacity to support development	Will provide additional system capacity to support development	Will provide additional system capacity to support development
Land Use	Reduced capacity for future development, potential moratorium condition	Will increase land use opportunities	Will increase land use opportunities	Will increase land use opportunities	Will increase land use opportunities
Floodplain Development	No impact	No impact	No impact	No impact	No impact
Wetlands and Water Quality	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Wild and Scenic Rivers	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Cultural Resources	No impact	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land
Flora & Fauna	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River fish habitat	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Recreation/Open Space	No impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Agricultural Lands	No impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Air Quality	No impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Energy	No impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Public Health	Public health risk from existing uncorrected deficiencies	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service

5.12 Effluent Disinfection

Treated wastewater effluent can contain potentially harmful infectious agents that pose a risk to humans and wildlife alike. Disinfection of wastewater effluent is required to inactivate and/or destroy pathogenic organisms, such as *E. coli*, *Salmonella*, and *Shigella*. Common forms of disinfection at wastewater treatment plants include chlorine and ultraviolet (UV) disinfection.

Residual chlorine in the wastewater is typically regulated to prevent toxic effects downstream of the WWTP. The Juliaetta WWTP NPDES permit limits total residual chlorine to a monthly average of 12 µg/L and 0.0080 lb/day; with a daily maximum of 21 µg/L and 0.014 lb/day (measured once a week).

Alternative 1 - Status Quo

The Juliaetta WWTP currently mixes effluent with a 12.5% sodium hypochlorite (NaOCl; liquid bleach) solution and retains the chlorinated wastewater in a contact chamber . Dechlorination tablets are added at the discharge end of the contact chamber to remove chlorine from the disinfected wastewater before releasing it into the Potlatch River. Both the effluent total residual chlorine concentration and effluent *E. coli* counts are approaching their permit limits. Due to the stringent NPDES permit requirement for total residual chlorine, once the laboratory methods are improved, it may become even more difficult to consistently achieve compliance. This status quo alternative assumes additional hours of operator attention to address the precise control requirements to consistently achieve compliance for total residual chlorine. With this alternative it is inevitable that more chemicals will be used than are needed, which costs the City additional money.

Alternative 2 - Improved Chlorine Disinfection

With proper control, chlorine disinfection is an effective, well-established technology for neutralizing common pathogens found in wastewater effluent. Other advantages of chlorine disinfection include reliability and effectiveness against a wide spectrum of pathogenic organisms, effectiveness in oxidizing certain organic and inorganic compounds, flexible dosing control, and the elimination of certain noxious odors during disinfection. Chlorine disinfection is generally more cost effective than other forms of disinfection. However, dechlorination can add additional costs. As previously stated, dechlorination is required at the Juliaetta WWTP to comply with total residual chlorine limits included in the NPDES permit.

Chlorine is highly corrosive and requires special safety considerations for proper storage, shipping, and handling. Chlorine also oxidizes certain types of organic matter in wastewater resulting in more hazardous compounds. Other disadvantages include an increased level of total dissolved solids in the treated effluent, decreased effectiveness in the presence of some parasitic species including cysts and eggs of parasitic worms, and the unknown long-term effects of discharging dechlorinated compounds into the environment. In a solution form, health and safety concerns associated with chlorine are greatly reduced. As such, the hypochlorite solution currently in use at the Juliaetta WWTP is a suitable option for chlorine disinfection.

An improved chlorine disinfection system at the Juliaetta WWTP would include updated controls for dosing the hypochlorite solution into the effluent, more precise equipment for measuring chlorine residual, a mechanical mixer, leak detection controls, and developing a system to track the expiration and timely replacement of chlorination and dechlorination chemicals. An additional chlorine contact basin would be included to provide redundancy so that a chlorine contact basin can be shutoff for

maintenance. This alternative would continue to require monitoring and reporting of total chlorine residual.

Alternative 3 - Ultraviolet (UV) Disinfection

Ultraviolet (UV) radiation has germicidal properties and, in proper doses, can be an effective bactericide and virucide for wastewater disinfection. UV disinfection has been applied to wastewater since the 1990s, but UV technology continues to rapidly develop. A typical UV disinfection system consists of UV lamps placed in quartz sleeves, associated supporting structure for the lamps, ballasts to supply regulated power, and a power supply. Mercury vapor contained in the lamps is excited using an electric arc, resulting in the emission of UV light.

Advantages of UV disinfection include the absence of toxic or corrosive materials, short contact time, small footprint, and lack of residual toxic byproducts. Disadvantages of this process include high power consumption and a higher capital cost than chlorine disinfection.

At the Juliaetta WWTP, UV lamps are assumed to be installed in an open-channel contact chamber (**Figures 5.12.1 & 5.12.2**, respectively). Retrofitting UV lamps to the existing chlorine contact chamber is not recommended, so the UV system could be built while the existing chlorine contact basin is online. Following construction, the existing chlorine contact chamber could be demolished, abandoned in place, or used as a backup if necessary.

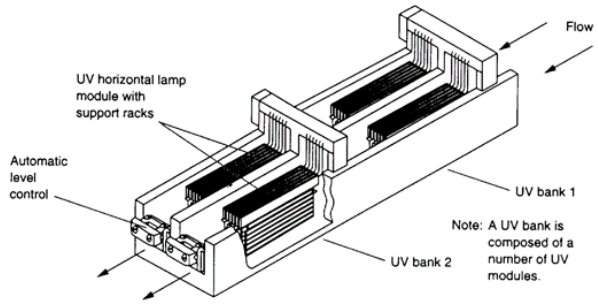


Figure 5.12.1 – Horizontal UV Disinfection System

Metcalf and Eddy, Inc. *Wastewater Engineering: Treatment and Reuse*. 4th ed. Boston: McGraw-Hill, 2003.

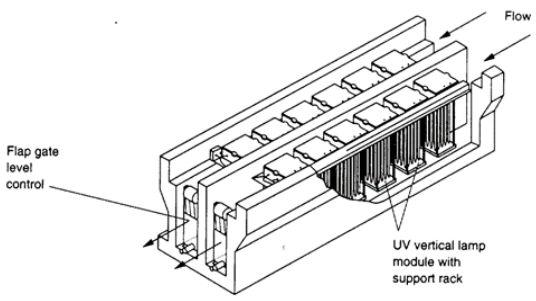


Figure 5.12.2 – Vertical UV Disinfection System

Metcalf and Eddy, Inc. *Wastewater Engineering: Treatment and Reuse*. 4th ed. Boston: McGraw-Hill, 2003.

Alternative 4 - Rehabilitate Existing Chlorine Contact Chamber

The existing chlorine contact chambers has built-in provisions to use slide gates to isolate each side as a separate chamber. The issue of redundancy could be temporarily resolved by installing slide gates that would properly seal and allow each side of the chamber to be taken down for maintenance or cleaning. Although this alternative is not a long term solution for the capacity and redundancy issues, proper maintenance may extend the life of the existing chlorine contact chamber.

Table 5.12.1 – Environmental Impacts of Effluent Disinfection Alternatives				
Environmental Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Status Quo	Improved Chlorine Disinfection	Ultraviolet (UV) Disinfection	Rehabilitate Existing Chlorine Contact Chamber
Climate / Physical Aspects (topography/geology/and soils)	No impact	No permanent adverse impacts	No permanent adverse impacts	No permanent adverse impacts
Population, Economic, and Social Profile	Uncorrected deficiencies increase maintenance costs, potential for emergencies, and opportunity for permit violations	Will provide additional system capacity to support development	Will provide additional system capacity to support development	Will provide additional system capacity to support development
Land Use	Reduced capacity for future development, potential moratorium condition	Will increase land use opportunities	Will increase land use opportunities	Will increase land use opportunities
Floodplain Development	No impact	No impact	No impact	No impact
Wetlands and Water Quality	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact	No adverse impact
Wild and Scenic Rivers	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact	Some potential for permit violations due to residual chlorine levels
Cultural Resources	No impact	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land
Flora & Fauna	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River fish habitat	No adverse impact	No adverse impact	No adverse impact
Recreation/Open Space	No impact	No adverse impact	No adverse impact	No adverse impact
Agricultural Lands	No impact	No adverse impact	No adverse impact	No adverse impact
Air Quality	No impact	No adverse impact	No adverse impact	No adverse impact
Energy	No impact	No adverse impact	No adverse impact	No adverse impact
Public Health	Public health risk from existing uncorrected deficiencies	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service

5.13 Sludge Treatment and Disposal

The secondary treatment will require the routine disposal of WAS. This process typically involves thickening, dewatering, drying, or otherwise conditioning the sludge prior to stabilization and disposal. With proper permitting and treatment, sludge may be applied to land, placed in a surface disposal site, or fired in a sewage sludge incinerator. In all cases, the use or disposal of sewage sludge must conform to EPA standards and 40 CFR Part 503.

Effective sludge thickening minimizes moisture and can reduce costs associated with biosolids storage, transportation, and disposal. Synthetic polymer may be mixed with the sludge slurry to improve coagulation and flocculation, resulting in shorter dewatering times. There are many options of polymers available in both dry and liquid forms. Polymer interaction with wastewater is somewhat sensitive and selecting the best polymer may require making adjustments over time.

The Juliaetta WWTP's biosolids, are transported to the Clearwater County Transfer Station. Most landfills require that biosolids can pass a paint filter test and contain no free liquids upon disposal.

Alternative 1 - Status Quo

The four storage beds currently in use at the Juliaetta WWTP do not provide enough storage for the sludge produced through the treatment process. The beds freeze during cold weather, preventing the removal of sludge from the beds and the ability to waste from the clarifier. The AC pipe that makes up the underdrain system is in unknown condition and will reach the end of its useful life before the planning year of 2039. Considering these points, the existing sludge storage system is insufficient to meet the current and future needs of the WWTP.

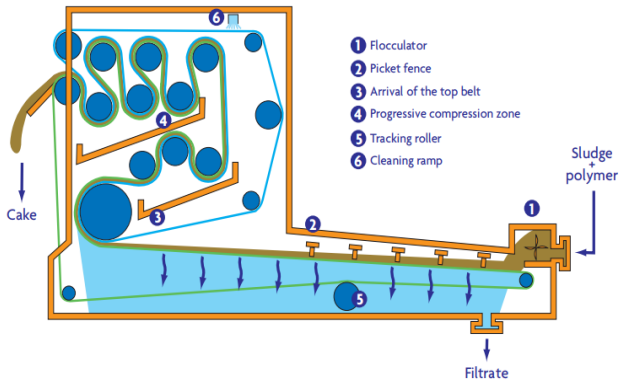
Alternative 2 - Improved Sludge Storage Beds

Two to four additional sludge drying beds could be added to increase the sludge storage capacity at the Juliaetta WWTP. The new beds would be designed to withstand traffic loads from the front-end loaders, utilize a trench drain system to collect percolate, and require an overhead roof system for weather protection. Additional improvements to the existing sludge handling facilities could include repairing damaged corrugated fiberglass and metal roof panels and upgrading the underdrain system. An analysis of the existing facilities would be conducted to determine the possibility of retrofitting the drying beds with in-ground trench drains to collect percolate and a concrete floor that slopes to grade for front-end loader access.

Some advantages of sludge drying beds include low energy consumption, little to no chemical consumption, low levels of technical skills required, and less sensitivity to sludge variability. Continuing the use drying beds at the Juliaetta WWTP keeps capital costs low and does not require more advanced operator skills. However, improving the sludge storage in Juliaetta does not solve the existing issues of frozen beds in cold weather and exposure to vectors. Because the exposed drying beds create a significant process issue, this alternative is not recommended for further consideration.

Alternative 3 - Belt Filter Press

A belt filter press (**Figure 5.13.1**) continuously dewaters sludge by applying pressure to the biosolids between two tensioned filter belts. The sludge is polymer conditioned before passing to the gravity drainage zones, low-pressure squeezing zone, and high-pressure squeezing zone. The filtrate separates from the solids and may be collected and discharged.



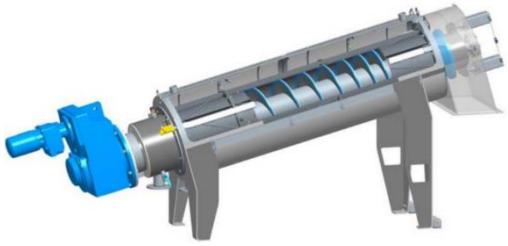
SNF FLOERGER. "Sludge Dewatering." www.snf.us/wp-content/uploads/2014/08/Sludge-Dewatering-E.pdf. Accessed May 14, 2019.

Figure 5.13.1 – Belt Filter Press

Some benefits of using a belt filter press include the ability to handle high sludge loading rates, low energy and polymer consumption, low wash water consumption, quiet continual processing, simple maintenance, and moderate costs. Disadvantages of using a belt filter press include possible odor release due to the open system, operator exposure to pathogens and aerosols, and added construction costs for an equipment room designed for odor control and fluid containment.

A belt filter press would be an appropriate solution for sludge handling at the Juliaetta WWTP because it is effective at dewatering sludge with minimal exposure to vectors and the elements. The Juliaetta site has adequate space for a mechanical building to house dewatering equipment.

Alternative 4 - Screw Press



HUBER Technology. "HUBER Screw Press." https://www.huber-technology.com/products/sludge-treatment/sludge-dewatering/huber-screw-press-q-pressr.html. Accessed October 29, 2019.

Figure 5.13.2 – Screw Press

A screw press (**Figure 5.13.2**) separates solids and waters using a simple mechanical screw and continuous gravity drainage. The sludge is pumped to the screw press, mixed with a flocculant and dewatered by compression as it advances up the helical screw. The resulting filtrate is collected and returned to the headworks.

Advantages of the screw press include low maintenance and less odor and noise potential than a belt press or drying bed. Screw presses are suitable for smaller wastewater treatment plants such as Juliaetta's. Disadvantages include a sensitivity to feed characteristics and a higher polymer use.

Table 5.13.1 – Environmental Impacts of Sludge Treatment & Disposal Alternatives				
Environmental Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Status Quo	Improved Sludge Storage Beds	Belt Filter Press	Screw Press
Climate / Physical Aspects (topography/geology/and soils)	No impact	No permanent adverse impacts	No permanent adverse impacts	No permanent adverse impacts
Population, Economic, and Social Profile	Uncorrected deficiencies increase maintenance costs, potential for emergencies, and opportunity for permit violations	Will provide additional system capacity to support development	Will provide additional system capacity to support development	Will provide additional system capacity to support development
Land Use	Reduced capacity for future development, potential moratorium condition	Will increase land use opportunities	Will increase land use opportunities	Will increase land use opportunities
Floodplain Development	No impact	No impact	No impact	No impact
Wetlands and Water Quality	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact	No adverse impact
Wild and Scenic Rivers	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River	No adverse impact	No adverse impact	No adverse impact
Cultural Resources	No impact	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land
Flora & Fauna	Uncorrected deficiencies increase opportunity for permit violations that threaten the quality of the Potlatch River fish habitat	No adverse impact	No adverse impact	No adverse impact
Recreation/Open Space	No impact	No adverse impact	No adverse impact	No adverse impact
Agricultural Lands	No impact	No adverse impact	No adverse impact	No adverse impact
Air Quality	No impact	No adverse impact	No adverse impact	No adverse impact
Energy	No impact	No adverse impact	No adverse impact	No adverse impact
Public Health	Public health risk from existing uncorrected deficiencies	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service

CHAPTER 6 COLLECTION SYSTEM ALTERNATIVE ANALYSIS

6.1 Collection System Projects

The alternatives discussed in Chapter 4 were reviewed and discussed with the City. The first priority for the collection system is to conduct additional analysis of the collection system as previously discussed. This would include an I & I analysis, condition assessment, TV work, smoke testing, hydraulic modeling, and ultimately would include recommendations for repairs and upgrades to the existing collection system. Also, as previously mentioned the five collection system projects included in this document are population-driven and should be implemented as the areas to the north and south of City limits expand. Alternative 4a is expected to be required the first chronologically, so it is considered a Priority 2 Improvement. The remaining alternatives are Priority 3 to be implemented as needed in anticipation of users being added to the system in the next twenty years.

A summary of these projects and their prioritization is included in the Capital Improvement Plan in Chapter 8 of this document.

6.2 Life-Cycle Costs

A life-cycle cost analysis was completed for each proposed collection system project, and is included in **Appendix L** along with the breakout of O&M costs. These life-cycle costs are a conservative present worth cost analysis assuming a 40-year useful life.

CHAPTER 7 WWTP ALTERNATIVE ANALYSIS

7.1 Life-Cycle Costs

A life-cycle cost analysis was completed for each proposed wastewater treatment plant project, excluding temperature compliance, and is included in **Appendix L**, including a breakout of O&M. These life-cycle costs are a conservative present worth cost analysis assuming a 20-year useful life.

7.2 Temperature Compliance

The selection of an alternative to comply with the temperature limits in the WWTP permit should be preceded by continuous temperature monitoring as previously described in this document. Several alternatives were discussed in Section 5.8 of this document. The use of a chiller for mechanical cooling is a reasonably conservative option and will be included in the capital improvement plan for budgeting purposes at this time (see **Appendix L** for cost estimate for a mechanical chiller). Following an evaluation of temperature data, which is currently scheduled to occur in Summer 2021, additional analysis will be conducted into alternatives that will address any deficiencies discovered.

7.3 Lift Station

The advantages and disadvantages, capital costs, and life-cycle costs of the four lift station alternatives are included in **Table 7.3.1**. See **Appendix L** for a breakout of capital costs. Capital costs include construction costs, general conditions, contingencies, contractor overhead & profit, admin, and engineering costs.

Table 7.3.1 – Lift Station Alternative Analysis

Alternative 1 – Status Quo	Alternative 2 – New Suction Lift Pump Station	Alternative 3 – New Submersible Lift Station	Alternative 4 – New Suction Lift Pumps & Lift Station Coating
Advantages			
• Operator familiarity • Lowest capital costs	• Operator familiarity • Easy access for visual inspection & maintenance • Fewer health & safety concerns associated with maintenance	• Lower capital cost than Alternative 2 • Optional grinder pump	• Similar advantages to Alternative 2 • Lower capital and life-cycle costs than Alternative 2 • No site work required
Disadvantages			
• Redundancy and	• Highest capital costs	• Pump is more difficult to access • Lower efficiency	• Higher capital and life-cycle costs than Alternative 3
Capital Costs			
$0	$419,000	$328,000	$397,000
Life-Cycle Costs			
$35,000	$454,000	$363,000	$432,000

After reviewing the available information, the City selected Alternative 3 – New Submersible Lift Station as the preferred alternative.

7.4 Preliminary Waste Treatment

The three preliminary treatment alternatives are listed in **Table 7.4.1**, along with advantages, disadvantages, and capital costs for each. The life-cycle costs of the preliminary treatment equipment were factored in the estimate for secondary waste treatment (**Section 7.6**).

Table 7.4.1 – Preliminary Treatment Alternative Analysis

Table 7.4.1 – Preliminary Treatment Alternative Analysis		
Alternative 1 – Status Quo	**Alternative 2 – Grit Removal & Coarse Screen**	**Alternative 3 – Grit Removal, Coarse & Fine Screens**
Advantages		
• Operator familiarity • Lowest capital costs	• Sufficient grit removal • Available replacement parts	• High quality grit removal • Available replacement parts
Disadvantages		
• Insufficient grit removal • Comminutor can no longer be repaired	• Higher capital costs than Alternative 1	• Highest capital costs
Capital Costs		
$0	$767,000	$1,283,000

Based on this information, and the selection of a secondary treatment method, the City selected Alternative 2 – Grit Removal & Coarse Screen as the preferred alternative for preliminary treatment.

7.5 Secondary Wastewater Treatment

The City reviewed five alternatives for secondary wastewater treatment, as summarized in **Table 7.5.1**. This table includes the advantages, disadvantages, capital, and life-cycle costs of each alternative.

Table 7.5.1 – Secondary Wastewater Treatment Alternative Analysis				
Alternative 1 – Status Quo	**Alternative 2 – Improved Extended Aeration**	**Alternative 3 – Oxidation Ditches**	**Alternative 4 – Membrane Bioreactors**	**Alternative 5 – Sequencing Batch Reactors**
Advantages				
• Operator familiarity • Adjusts to fluctuations in organic loading and flow • Relatively small footprint • Relatively low sludge yield • Lowest operational requirements	• Operator familiarity • Adjusts to fluctuations in organic loading and flow • Relatively low sludge yield • Lowest operational requirements	• Relatively low sludge yield • Low operational requirements	• Smallest footprint • Higher effluent quality • Low operational requirements	• Can perform nitrification, denitrification, and/or phosphorus removal • Operational flexibility • Operational changes can be made remotely

Table 7.5.1 – Secondary Wastewater Treatment Alternative Analysis				
Alternative 1 – Status Quo	**Alternative 2 – Improved Extended Aeration**	**Alternative 3 – Oxidation Ditches**	**Alternative 4 – Membrane Bioreactors**	**Alternative 5 – Sequencing Batch Reactors**
Disadvantages				
• Insufficient capacity • Does not achieve denitrification or phosphorus removal • Limited flexibility to adapt to permit changes • Long aeration requires more energy	• Does not achieve denitrification or phosphorus removal • Limited flexibility to adapt to permit changes • Long aeration requires more energy	• Largest footprint • Increased equipment noise • Limited flexibility to adapt to permit changes	• Highest capital costs • High O&M costs • Effluent quality beyond • Requires high level of preliminary treatment	• Adjustments are more difficult for small communities • Post equalization may be required • Frequent sludge disposal • High energy consumption
Capital Costs				
$0	$2,810,000	$4,530,000	$4,627,000	$3,022,000
Life-Cycle Costs[1]				
$910,000	$4,485,000	$6,975,000	$7,235,000	$4,749,000

[1] Life-cycle Costs for Secondary Treatment also account for the associated costs of preliminary treatment.

After reviewing the information provided, the City selected Alternative 2 – Improved Extended Aeration as the preferred alternative.

7.6 Effluent Disinfection

The advantages and disadvantages of four effluent disinfection alternatives are presented in **Table 7.6.1**, along with their respective capital and life-cycle costs.

Table 7.6.1 – Effluent Disinfection Alternative Analysis			
ALTERNATIVE 1 – Status Quo	**ALTERNATIVE 2 – Improved Chlorine Disinfection**	**ALTERNATIVE 3 – Ultraviolet (UV) Disinfection**	**ALTERNATIVE 4 – Add Slide Gates to Chlorine Chamber**
Advantages			
• Operator familiarity • Lower energy consumption • Flexible dosing control • Some odor elimination	• Improved controls for chemical dosing, monitoring, and mixing leads to decreased chemical usage and continued compliance with permit limits • Some odor elimination	• Continued compliance with permit limits • Lower environmental impact • Short contact time • Small footprint	• Similar advantages as Alternative 1 • Redundancy provided at low capital cost

Table 7.6.1 – Effluent Disinfection Alternative Analysis			
ALTERNATIVE 1 – Status Quo	**ALTERNATIVE 2 – Improved Chlorine Disinfection**	**ALTERNATIVE 3 – Ultraviolet (UV) Disinfection**	**ALTERNATIVE 4 – Add Slide Gates to Chlorine Chamber**
Disadvantages			
• May not be able to consistently achieve the stringent total residual chlorine limits • Need to reduce residual chlorine, since it is toxic, through dechlorination • Increased costs and opportunity for violations • Requires transportation and storage of hazardous chemicals • Potential adverse environmental impact	• Need to reduce residual chlorine, since it is toxic, through dechlorination • Increased costs and opportunity for violations • Requires transportation and storage of hazardous chemicals • Potential adverse environmental impact	• High power consumption • No residual chlorine treatment • High solids (process upsets) or algae can impact the UV disinfection • Higher capital cost	• Similar disadvantages as Alternative 1
Capital Costs			
$0	$469,000	$510,000	$8,000
Life-Cycle Costs			
$224,000	$555,000	$631,000	$232,000

The City elected to pursue Alternative 4 – Add Slide Gates to Chlorine Contact Chamber as a temporary measure funded from the City's budget. The preferred long-term solution, Alternative 2 – Improved Chlorine Disinfection, was factored to the capital cost estimates for Secondary Treatment Alternative 2 because chlorine disinfection may be included with an extended aeration package system.

7.7 Sludge Treatment & Disposal

Four alternatives were presented for sludge treatment and disposal. The advantages, disadvantages, capital costs, and life-cycle costs of these alternatives are included in **Table 7.7.1**.

Table 7.7.1 – Sludge Treatment & Disposal Alternative Analysis			
ALTERNATIVE 1 – Status Quo	**ALTERNATIVE 2 – Improved Sludge Storage Beds**	**ALTERNATIVE 3 – Belt Press**	**ALTERNATIVE 4 – Screw Press**
Advantages			
• Operator familiarity • No power consumption • Low maintenance requirements • Little sensitivity to sludge variability • High cake solids	• Additional storage for wasting • Operator familiarity • No power consumption • Low maintenance requirements • Little sensitivity to sludge variability • High cake solids	• Lower capital costs • Low power and polymer consumption • Low speed equipment • Smaller footprint than drying beds	• Low power consumption • Low speed equipment • Smaller footprint than drying beds • Enclosed process – less ventilation and noise potential

Table 7.7.1 – Sludge Treatment & Disposal Alternative Analysis			
ALTERNATIVE 1 – Status Quo	**ALTERNATIVE 2 – Improved Sludge Storage Beds**	**ALTERNATIVE 3 – Belt Press**	**ALTERNATIVE 4 – Screw Press**
Disadvantages			
• Weather-dependent operation • Potential for odors & vector attraction • Sludge removal is labor intensive	• Does not resolve freezing issue • Wasting delays still likely • Potential for odors & vector attraction • Sludge removal is labor intensive	• Requires new building • Requires grinder or prescreening to prevent objects from damaging belt • Lower cake solids • Humid, odorous, and noisy atmosphere	• Higher polymer consumption • Lower cake solids • Humid, odorous, and noisy atmosphere • Highest capital costs
Capital Costs			
$0	$998,000	$1,217,000	$1,438,000
Life-Cycle Costs			
--	$1,634,000	$1,836,000	$1,816,000

After reviewing the available information, the City selected Alternative 4 – Screw Press as the preferred alternative.

CHAPTER 8 PROPOSED PROJECT

8.1 Preliminary Project Design

The City has elected to pursue constructing a new lift station with submersible pumps (Lift Station Alternative 3), installing a grit removal and coarse screening headworks (Preliminary Waste Treatment Alternative 2), upgrading to a package extended aeration secondary treatment system (Secondary Wastewater Treatment Alternative 2), minor modifications to the chlorine contact chamber (Effluent Disinfection Alternative 4), and installing a screw press (Sludge Processing Alternative 4). The general size, capacity, and type of equipment has been discussed in Chapter 5. These Priority 1 projects – along with other improvements that will be driven by development – have been organized into a Capital Improvement Plan (CIP). The improvements are prioritized by need and displayed in **Table 8.1.1** and **Table 8.1.2**.

It is recommended that the City pursue planning grant funding to aid in further evaluation of the collection system through an I & I Study as discussed in Sections 2.1.7 and 4.1 of this report. This evaluation should be completed prior to any Priority 2 and 3 collection system projects in case any improvements recommended there need to be resized.

Also included in the CIP are Priority 2 and Priority 3 projects, which are intended to provide redundancy or improved process controls, but are less critical to the performance and DEQ compliance of the WWTP. **Appendix L** contains detailed cost estimates for each improvement project. Estimated costs include construction costs, general conditions, contingencies, contractor overhead & profit, admin, and engineering costs.

Table 8.1.1 – Collection System Capital Improvement Plan

ID#	Item	Estimated Cost (2020)
Priority 1 Improvements		
1.8	Collection System Analysis and I&I Study (Project 5)	$60,000
	Collection System Priority 1 Improvements	**$60,000**
Priority 2 Improvements		
2.1	Southwest Expansion of Collection System (Project 4a)	$1,159,000
	Collection System Priority 2 Improvements	**$1,159,000**
Priority 3 Improvements		
3.3	Southeast Expansion of Collection System (Project 4b)	$311,000
3.4	Northwest Expansion of Collection System (Project 3)	$331,000
3.5	Northeast Expansion of Collection System (Project 2)	$949,000
3.6	Upgrade Existing 10" Main (Project 1)	$1,344,000
	Collection System Priority 3 Improvements	**$2,935,000**

Table 8.1.2 – WWTP Capital Improvement Plan		
ID#	**Item**	**Estimated Cost (2020)**
Priority 1 Improvements		
1.1	New Lift Station with Screw Centrifugal Pumps	$328,000
1.2	Preliminary Treatment Improvements	$767,000
1.3	Secondary Treatment Improvements	$2,810,000
1.4	Sludge Treatment & Disposal	$1,438,000
1.5	Continuous Flow & Temperature Monitoring of Influent & Effluent	$157,000
1.6	New Generator	$88,400
1.7	Add Slide Gates to Chlorine Chamber	$8,000
	WWTP Priority 1 Improvements	**$5,596,400**
Priority 2 Improvements		
	None	
	WWTP Priority 2 Improvements	**-**
Priority 3 Improvements*		
3.1	Composite Samplers	$37,000
3.2	Temperature Treatment	$448,000
	WWTP Priority 3 Improvements	**$573,400**

* Priority 3 Improvements may shift to Priority 1 following evaluation of temperature data in Summer 2021.

8.2 Project Implementation Schedule

Generally, Priority 1 and 2 improvements should be implemented within the next 1-5 years; and Priority 3 improvements should be completed as needed to accommodate development.

In order to provide a more affordable project, Priority 1 WWTP improvements may need to be phased over a multi-year project to maximize grant funds through multiple application cycles. These improvements are anticipated to be phased as described in **Table 8.2.1**. It is anticipated that both Phase 1 and 2 Improvements will be designed as early as 2021 with construction of Phase 1 in 2022 and construction of Phase 2 in 2023. This timeline is subject to passage of a bond election and award of sufficient funding from varying agencies to fund these improvements.

Table 8.2.1 – WWTP Priority 1 Improvements Phasing		
ID#	**Item**	**Estimated Cost (2020)**
Phase 1 – Year 1		
1.2	Preliminary Treatment Improvements	$767,000
1.3	Secondary Treatment Improvements	$2,810,000
	Phase 1 Improvements	**$3,577,000**
Phase 2 – Year 2		
1.1	New Lift Station with Screw Centrifugal Pumps	$328,000
1.4	Sludge Treatment & Disposal	$1,438,000
1.5	Continuous Flow & Temperature Monitoring of Influent & Effluent	$157,000
1.6	New Generator	$88,400
3.1	Composite Samplers*	$37,000
3.2	Temperature Treatment*	$448,000
	Phase 2 Improvements	**$2,496,400**
Project Self Performed by City		
1.7	Add Slide Gates to Chlorine Chamber	$8,000
	Self Performed Improvements	**$8,000**

* May shift to Priority 1 following evaluation of temperature data in Summer 2021.

8.3 Permit Requirements

The WWTP will continue to operate under a NPDES discharge permit and the contractor will be required to obtain a construction permit prior to beginning work at the site. If during preliminary design, the site is found to be within the floodplain, additional permitting may be required.

Permits required for construction activities may include building permits through Latah County, a construction stormwater permit through DEQ, and an ITD Right-of-Way encroachment permit for any work within the right-of-way along the highway.

8.4 Sustainability Considerations

8.4.1 Water & Energy Efficiency

Juliaetta is making improvements to management based sustainability initiative efforts, including plans to implement a capital budget that is funded and supported by a capital improvement plan (accomplished with this Facility Plan), and implement a formal asset management system. 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.

8.4.2 Green Infrastructure

Improvements to onsite stormwater runoff at the City's wastewater treatment plant will be addressed with the WWTP upgrade project. Improvements may include onsite bio-infiltration retention ponds or swales to help collect and treat stormwater prior to discharging to the nearby Potlatch River.

8.4.3 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 control building and with onsite WWTP lighting.
- Variable frequency drive (VFD) pumps at the WWTP.
- Energy efficient motors that meet National Electrical Manufacturers Association (NEMA) Premium specification.
- Aeration improvements, such as fine bubble aeration, VFD blowers, and automated dissolved oxygen control.
- Supervisory control and data acquisition (SCADA) system installation at the WWTP.

8.5 Operator Requirements

Currently, the City of Juliaetta's existing collection system is classified as a Class I system and the WWTP is classified as a Class II facility. There is no anticipated need for additional operators or license classes upon the completion of these improvements.

8.6 Engineer's Opinion of Probable Cost

Cost estimates for each recommended improvement are summarized in the CIP (**Tables 8.1.1** and **8.1.2**); detailed costs are provided in **Appendix L**.

8.7 Annual Operating Budget

Improvements to the collection system and WWTP will require adjustments the wastewater annual operating budget. The following paragraphs describe potential financing options for the proposed project.

8.7.1 Income

The City's income for the wastewater collection and treatment system comes from monthly user rates. The historic user rates were described in section 2.5.

8.7.2 Proposed Rate Schedule

Various funding sources and scenarios will be discussed in section 8.7. The proposed user rate is projected based on the expected available funding from these sources (**Table 8.7.1**) and will be further discussed later in this document.

Table 8.7.1 – Future Wastewater System Expenditures and Resulting User Rates							
	Projected						
Projected Connections	2021	2022	2023	2025	2030	2035	2040
New Growth (EDUs)[1]	4	4	4	8	22	25	25
Beginning # of EDUs	297	301	305	313	335	360	385
Annual Expenses							
O&M[2]	$96,754	$101,600	$106,700	$117,600	$150,200	$191,700	$244,800
Existing WWTP Bond Payment	$0	$0	$0	$0	$0	--	--
New WWTP Bond Payment[3]	--	$86,265	$86,265	$86,265	$86,265	$86,265	$86,265
10% Reserve	--	$8,627	$8,627	$8,627	$8,627	$8,627	$8,627
Short Lived Assets[4]	--	$29,500	$31,000	$34,200	$43,700	$55,800	$71,200
Additional O&M[5]	--	$25,000	$26,300	$29,000	$37,100	$47,600	$60,800
Total Annual Expenses	**$96,754**	**$250,992**	**$258,892**	**$275,692**	**$325,892**	**$389,992**	**$471,692**
Typical Monthly User Rate/EDU	$55	$70	$72	$75	$83	$92	$103
User Rate Income							
Revenue	**$196,020**	**$252,840**	**$261,708**	**$280,246**	**$333,604**	**$398,732**	**$474,276**
Net Revenue	$99,266	$1,848	$2,816	$4,554	$7,712	$8,740	$2,584

(1) Based on a 1.4% growth rate for projected years
(2) O&M costs increased by 5% per year to offset inflation in costs of goods, services, and personnel
(3) Assumes the City obtains DEQ interim financing w/ principal forgiveness, two $500,000 CDBG grant awards, $750,000 from USACE, a 45% USDA grant, and a 40-year USDA loan for $1,842,203 at 3.5% interest rate
(4) Short Lived Assets increased by 5% per year to offset inflation in costs of goods, services, and personnel
(5) Additional O&M Costs increased by 5% per year to offset inflation in costs of goods, services, and personnel

8.7.3 Annual O&M Costs

Details of the expected operation and maintenance costs are included in **Appendix L**. Increases in the operation and maintenance due to improvements at the WWTP are summarized in **Table 8.7.2**. These costs were taken into account in developing the proposed financing scenario.

Table 8.7.2 – Existing and Proposed Annual O&M Costs			
Component	Existing Annual O&M Costs	Proposed Annual O&M Cost	Net Increase
Lift Station	$2,000.00	$2,000.00	$0.00
Extended Aeration	$45,000.00	$53,000.00	$8,000.00
Dewatering	$5,000.00	$22,000.00	$17,000.00
Disinfection	$13,000.00	$13,000.00	$0.00
TOTAL	**$65,000.00**	**$90,000.00**	**$25,000.00**

8.7.4 Debt Repayments

Many of the recommended improvements identified above will be necessary in order to accommodate demands created by future growth, as well as address existing deficiencies. Consequently, adequate funds generated by hook-up fees from future connections, user rates from existing customers, grants, and long-term financing options will all be needed to fund these recommended improvements.

A variety of funding sources exist in both the private and public sectors, contingent on a project meeting certain criteria. The following paragraphs give a brief description of several grant and loan resources available.

Idaho Department of Environmental Quality (Water Pollution Control State Revolving Loan Fund [SRF])

The SRF program is funded by a combination of federal monies supplied by EPA and state funds from loan repayments and the Water Pollution Control Account. Owners of public wastewater systems can apply for SRF funds annually through a competitive process, which generally has a Letter of Interest (LOI) deadline around January of each year. LOIs are prioritized by State officials based on need, sustainability, water quality improvements, and other criteria. Davis-Bacon wages are required. Currently, loan terms can range from 20-30 years, and interest rates from 0-2%, depending on applicant's user rates and median household income. Applicants may even qualify for principal forgiveness. 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 judicial confirmation, is required for this funding source. Qualifying public utilities may receive funding as soon as July of the same year.

Department of Commerce (DOC) and Community Development Block Grants (CDBG)

The Department of Commerce offers a number of grant programs for public water 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, which generally has a deadline in November. Funding results are typically finalized by April or May of the following year.

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

USDA-RD offers a grant and loan program for improvements to water systems that serve rural communities, which is defined as systems that serve less than 10,000 people. Grants are typically up to 25%, but can sometimes increase up to approximately 45% depending on availability of funding, user need, median income, and comparison of rates to peer communities throughout the State. Applicants can apply for USDA-RD funds at any time during the year. Funds include several program requirements – including but not limited to the completion of a short-lived asset inventory and approved engineering report; and limited funding for fire-protection water storage volumes. Voter approval in a bond election and interim financing are required with this funding source.

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 capital markets at competitive interest rates. Under the Idaho Bond Bank program, 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 make loan payments, which 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. Funds administered through the Bond Bank are not subject to Davis-Bacon wages or American Iron and Steel requirements found in other funding sources.

The Bond Bank is able to pledge certain state funds as additional security for its bonds, further reducing interest costs. The Idaho Bond Bank Authority can open doors to municipalities that were previously barred from the capital markets due to high costs of financing or challenging credit situations. The current underlying rating from Moody's Rating Agency is Aa1. Rates are typically higher than USDA or DEQ options.

Local and Private

In addition to federal and state funding programs, local and private funding sources are available to communities as well. These include a local improvement district (LID), the municipal bond market with voter approval, a business improvement district (BID), urban renewal district, connection fees, and development agreements with developers. Due to Juliaetta's size, growth projection, and overall makeup, these options would likely not be feasible.

Financing Scenarios

DEQ, SRF, CDBG, and USDA-RD appear to be the most favorable funding sources for the City to pursue. All four options could potentially provide assistance in the form of grant money or principal forgiveness to lessen the impact on Juliaetta's user rates. **Table 8.7.3** presents several funding scenarios from DEQ, USDA-RD, Municipal Bond, and the Department of Commerce. The scenarios include the priority 1 improvements at the WWTP. Table 8.7.3 assumes a 25% USDA grant, and **Table 8.7.4** assumes a 45% USDA grant which is dependent on the agency's annual funding and is in no way guaranteed. The proposed rates assumes that the City proceeds with the fourth funding option for Priority 1 WWTP improvements presented in the CIP and that USDA-RD grant funds are at 45%. This option also assumes that the City will use CDBG in two separate funding cycles (two awards of $500,000 each), DEQ as interim financing, and then USDA-RD for final financing. For all funding options, the City will need authorization to borrow the funds (either through a bond or judicial confirmation).

Table 8.7.3 – Financing Option Impacts to User Rates – 25% USDA Grant							
Priority 1 WWTP Improvements							
Funding Agency	DEQ[2]	USDA[3]	DEQ[2] + CDBG[4] + Local Match	USDA[5] + CDBG[4] + Local Match	DEQ, USDA[6] + CDBG[4] + Local Match	DEQ, USDA[6] + CDBG[4] + USACE[7] + Local Match	Municipal Bond
Interest	**1.75%**	**3.50%**	**1.75%**	**3.50%**	**3.50%**	**3.50%**	**4.00%**
Term	**30**	**40**	**30**	**40**	**40**	**40**	**25**
Project Cost[1]	$5,596,400	$5,596,400	$5,596,400	$5,596,400	$5,596,400	$5,596,400	$5,596,400
DEQ/USDA Grant	$496,940	$1,399,100	$496,940	$1,149,100	$1,521,805	$1,334,305	$0
CDBG/USACE Grant	$0	$0	$1,000,000	$1,000,000	$1,000,000	$1,750,000	$0
Applicant Local Match	$0	$0	$0	$0	$0	$0	$0
Annual Costs							
Existing O&M[8]	$101,600	$101,600	$101,600	$101,600	$101,600	$101,600	$101,600
Additional O&M	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000
Existing Bond Payment	$0	$0	$0	$0	$0	$0	$0
New Annual Bond Payment	$219,938	$196,548	$176,809	$161,428	$143,975	$117,635	$358,237
10% Reserve	$21,994	$19,655	$17,681	$16,143	$14,397	$11,763	$35,824
Short Lived Assets Reserve	$29,500	$29,500	$29,500	$29,500	$29,500	$29,500	$29,500
Total Expenses	$398,032	$372,303	$350,590	$333,670	$314,472	$285,498	$550,160
Existing Monthly Base Rate[9]	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
Equivalent Dwelling Units (EDU)[10]	301	301	301	301	301	301	301
Annual Revenue							
Annual User Rate Revenue	$108,360	$108,360	$108,360	$108,360	$108,360	$108,360	$108,360
Other Revenue	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$108,360	$108,360	$108,360	$108,360	$108,360	$108,360	$108,360
Net Revenue	**($289,672)**	**($263,943)**	**($242,230)**	**($225,310)**	**($206,112)**	**($177,138)**	**($441,800)**
Additional User Rate Needed	**$80.20**	**$73.07**	**$67.06**	**$62.07**	**$57.06**	**$49.04**	**$122.31**
Proposed User Rate	**$110.20**	**$103.07**	**$97.06**	**$92.07**	**$87.06**	**$79.04**	**$152.31**

[1] Includes priority 1 wastewater treatment project costs in 2020 dollars, excluding project 1.7.
[2] Includes principal forgiveness amount listed on the FY 2021 Intended Use Plan.
[3] Assumes 25% grant from USDA Rural Development.
[4] Assumes two separate CDBG grants of $500,000 each in two separate funding years.
[5] Assumes 25% grant from USDA of balance after CDBG and Local Match.
[6] Assumes 25% grant from USDA of balance after CDBG, Local Match, and not including DEQ Principal Forgiveness.
[7] Assumes approximate $750,000 USACE funds.
[8] Projected 2022 O&M costs increased by 5% per year to offset inflation of goods, services, and personnel.
[9] Base Monthly Rate per equivalent dwelling unit as of October 1, 2019.
[10] Projected 2022 EDUs based on growth rate of 1.4%.

Table 8.7.4 – Financing Option Impacts to User Rates – 45% USDA Grant							
Priority 1 WWTP Improvements							
Funding Agency	DEQ[2]	USDA[3]	DEQ[2] + CDBG[4] + Local Match	USDA[5] + CDBG[4] + Local Match	DEQ, USDA[6] + CDBG[4] + Local Match	DEQ, USDA[6] + CDBG[4] + USACE[7] + Local Match	Municipal Bond
Interest	**1.75%**	**3.50%**	**1.75%**	**3.50%**	**3.50%**	**3.50%**	**4.00%**
Term	**30**	**40**	**30**	**40**	**40**	**40**	**25**
Project Cost[1]	$5,596,400	$5,596,400	$5,596,400	$5,596,400	$5,596,400	$5,596,400	$5,596,400
DEQ/USDA Grant	$496,940	$2,518,380	$496,940	$2,068,380	$2,341,697	$2,004,197	$0
CDBG/USACE Grant	$0	$0	$1,000,000	$1,000,000	$1,000,000	$1,750,000	$0
Applicant Local Match	$0	$0	$0	$0	$0	$0	$0
Annual Costs							
Existing O&M[8]	$101,600	$101,600	$101,600	$101,600	$101,600	$101,600	$101,600
Additional O&M	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000
Existing Bond Payment	$0	$0	$0	$0	$0	$0	$0
New Annual Bond Payment	$219,938	$144,135	$176,809	$118,380	$105,582	$86,265	$358,237
10% Reserve	$21,994	$14,414	$17,681	$11,838	$10,558	$8,627	$35,824
Short Lived Assets Reserve	$29,500	$29,500	$29,500	$29,500	$29,500	$29,500	$29,500
Total Expenses	$398,032	$314,649	$350,590	$286,318	$272,240	$250,992	$550,160
Existing Monthly Base Rate[9]	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
Equivalent Dwelling Units (EDU)[10]	302	302	302	302	302	302	302
Annual Revenue							
Annual User Rate Revenue	$108,360	$108,360	$108,360	$108,360	$108,360	$108,360	$108,360
Other Revenue	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$108,360	$108,360	$108,360	$108,360	$108,360	$108,360	$108,360
Net Revenue	**($289,672)**	**($206,289)**	**($242,230)**	**($177,958)**	**($163,880)**	**($142,632)**	**($441,800)**
Additional User Rate Needed	**$80.20**	**$57.11**	**$67.06**	**$49.27**	**$45.37**	**$39.49**	**$122.31**
Proposed User Rate	**$110.20**	**$87.11**	**$97.06**	**$79.27**	**$75.37**	**$69.49**	**$152.31**

[1] Includes priority 1 wastewater treatment project costs in 2020 dollars, excluding project 1.7.
[2] Includes principal forgiveness amount listed on the FY 2020 Intended Use Plan.
[3] Assumes 45% grant from USDA Rural Development.
[4] Assumes two separate CDBG grants of $500,000 each in two separate funding years.
[5] Assumes 45% grant from USDA of balance after CDBG and Local Match.
[6] Assumes 45% grant from USDA of balance after CDBG, Local Match, and not including DEQ Principal Forgiveness.
[7] Assumes approximate $750,000 USACE funds.
[8] Projected 2022 O&M costs increased by 5% per year to offset inflation of goods, services, and personnel.
[9] Base Monthly Rate per equivalent dwelling unit as of October 1, 2019.
[10] Projected 2022 EDUs based on growth rate of 1.4%.

8.7.5 Reserves

The existing and proposed loan oblication reserve requirements are described in the following sections.

Debt Service Reserve

A 10% reserve is included in Tables 8.7.3 and 8.7.4 and is recommended, and sometimes required to receive funding from DEQ. No other specific debt service reserves are required or accounted for in the projection of user rates.

Short Lived Assets Reserve

System costs for short-lived assets (SLA) should be for reserved to replace or repair components of the facility which is being financed "…which have a useful life significantly less than the repayment period of the loan." For example, if the project is only construction of wastewater collection lines there will likely be no SLAs, but if the project and/or facility being financed includes lift station pumping improvements or treatment equipment there will be SLAs. SLA items are equipment or assets which are not daily/weekly/monthly O&M type items. The time frame for these items has been established in three periods: 0-5 years, 6-10 years, and 11-15 years. SLA costs and replacement times for the City of Juliaetta have been summarized in **Appendix L**. The estimated yearly budget for SLAs for the City of Juliaetta is $29,500 and should be reserved in addition to O&M, capital, and debt payment reserves.

8.8 Potential Environmental Effects of Selected Alternatives

The potential environmental impacts for the proposed project will be the sum of the environmental impacts of each selected alternative, as summarized in **Table 8.8.1**.

Table 8.8.1 – Potential Environmental Effects of Selected Alternatives

Environmental Criteria	Lift Station Alternative 3	Preliminary Treatment Alternative 2	Secondary Treatment Alternative 2	Effluent Disinfection Alternative 4	Sludge Treatment & Disposal Alternative 4
	New Submersible Lift Station	Grit Removal & Coarse Screen	Improved Extended Aeration	Add Slide Gates to Chlorine Chamber	Screw Press
Climate / Physical Aspects (topography/ geology/and soils)	No permanent adverse impacts	No permanent adverse impacts	No permanent adverse impacts	No permanent adverse impacts	No permanent adverse impacts
Population, Economic, and Social Profile	Will provide additional system capacity to support development	Will provide additional system capacity to support development	Will provide additional system capacity to support development	Will provide additional system capacity to support development	Will provide additional system capacity to support development
Land Use	Will increase land use opportunities	Will increase land use opportunities	Will increase land use opportunities	Will increase land use opportunities	Will increase land use opportunities
Floodplain Development	No impact	No impact	No impact	No impact	No impact
Wetlands and Water Quality	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Wild and Scenic Rivers	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Cultural Resources	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land	Impact unlikely because construction will be in previously disturbed land
Flora & Fauna	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Recreation/Open Space	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Agricultural Lands	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Air Quality	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Energy	No adverse impact	No adverse impact	No adverse impact	No adverse impact	No adverse impact
Public Health	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service	Positive long-term impact on City's ability to provide wastewater service

CHAPTER 9 CONCLUSIONS & RECOMMENDATIONS

9.1 Priority 1 WWTP Improvements

It is recommended that the City of Juliaetta proceed with completing Priority 1 improvements to the WWTP and consider Phasing the construction of these improvements to help maximize funding potential through agencies such as the Idaho Department of Commerce. Additionally, it is recommended that the City consider including the two Phase 3 projects in any estimates for bond elections in case these two projects are added into the Priority 1 WWTP Improvements project. These improvements are summarized in the proposed project as described in Chapter 8.

9.2 Collection System Improvements

It is recommended that the City proceed with the Collection System Analysis and I & I Study ranked as a Priority 1 improvement. The City should apply for planning grant assistance to help fund the study. Also, several improvements to the collection system were described in this facility plan and ranked as Priority 2 and 3 improvements. These projects are intended to be implemented in response to increased population as described in Chapter 4. Based on the record drawins, the City should be prepared to encounter, handle, and appropriately dispose of existing AC pipelines.

9.3 Effluent Temperature Monitoring

In addition to the proposed project described in Chapter 8, it is recommended that the City of Juliaetta begin continuously monitoring of the WWTP effluent temperature. After the City has collected at least one year of effluent temperature data, a plan should be made to achieve compliance with the temperature requirements in the WWTP NPDES permit. This plan may include an analysis of the WWTP data to determine the level of treatment needed, further analysis of the temperature treatment alternatives discussed in this document, and the selection of a temperature treatment to be implemented at the WWTP. A regional solution to the WLA placed on the Potlatch River may be further explored while this plan is developed. If temperature improvements are needed they could be added to the Priority 1 WWTP Improvements project as a Phase 2 improvement as discussed in this document. The City's solution for the temperature WLA should be implemented according to the compliance schedule included in their NPDES permit.

9.4 Additional WWTP Improvements

Priority 2 and 3 improvements for the WWTP are recommended to be implemented as needed and when funding is available to do so. The City budget may allow for improvements such as the addition of slide gates to the chlorine contact chamber and the purchase and installation of composite sampling equipment, which would not require an additional capital improvement project.

APPENDIX A

Figures

KELLER ASSOCIATES

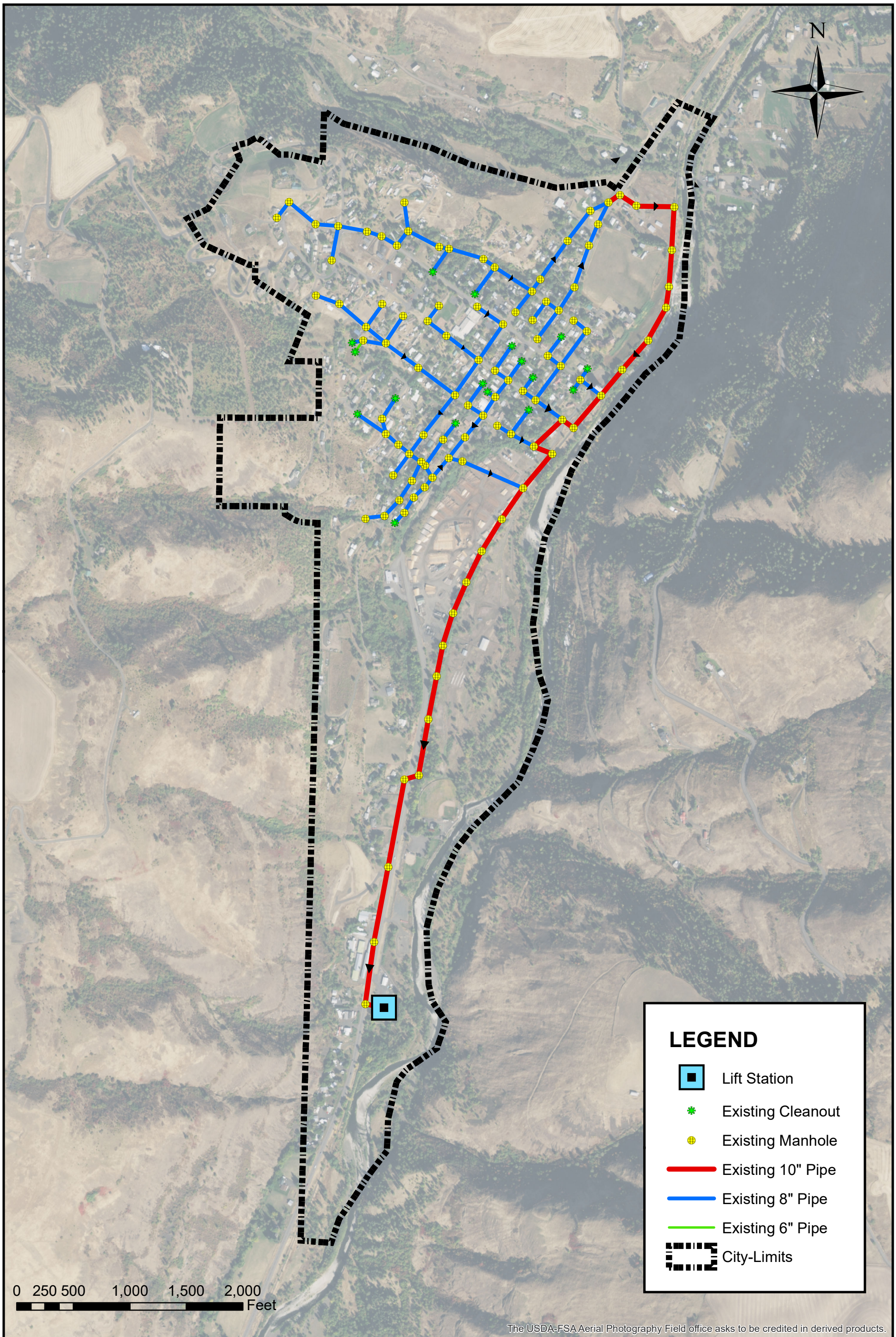


Figure:	Title:	Project: 218137	
1	**Existing Pipe Diameters**	**Juliaetta WWTP**	KELLER ASSOCIATES

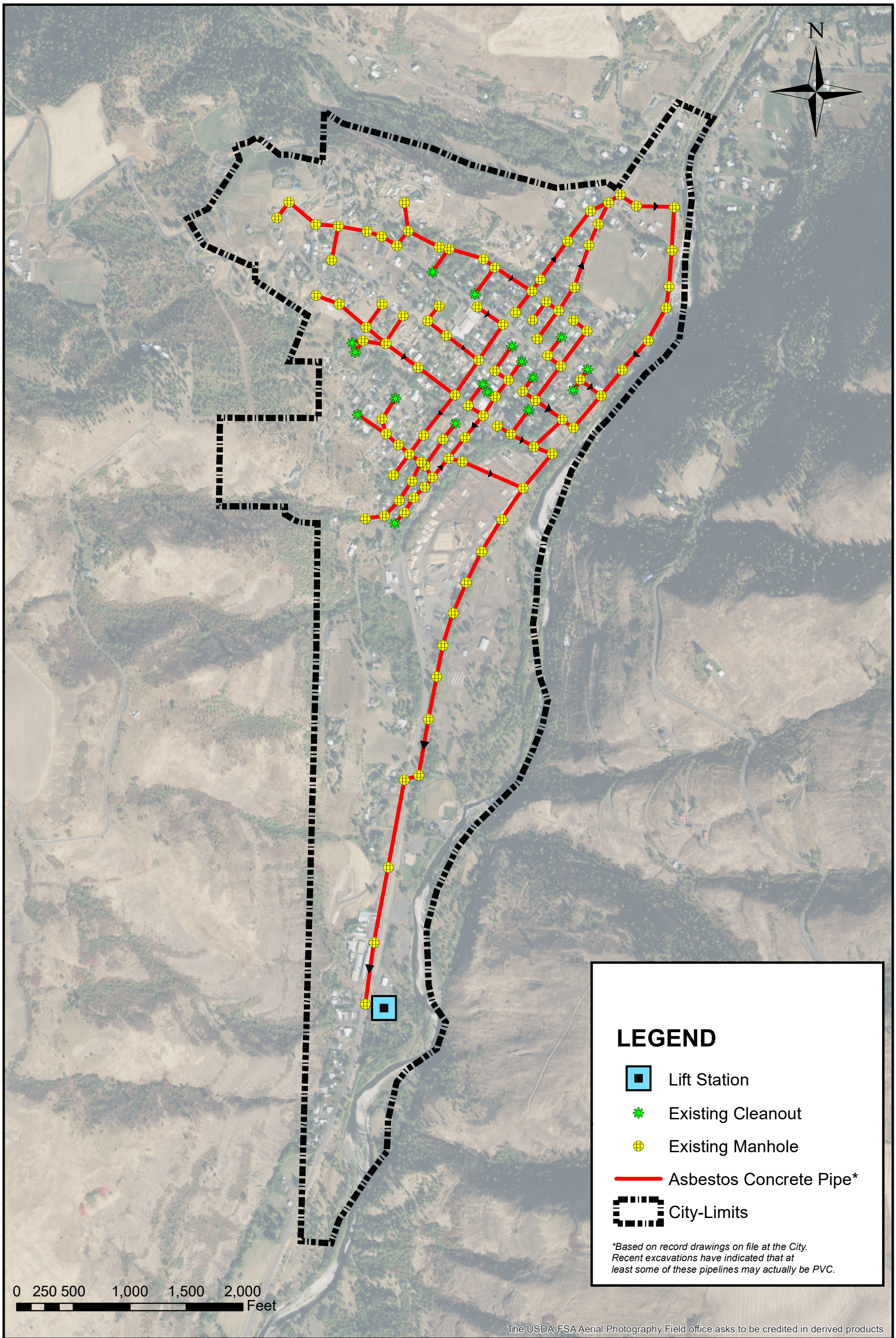


Figure:	Title:	Project: 218137	
2	Existing Pipe Material	Juliaetta WWTP	KELLER ASSOCIATES

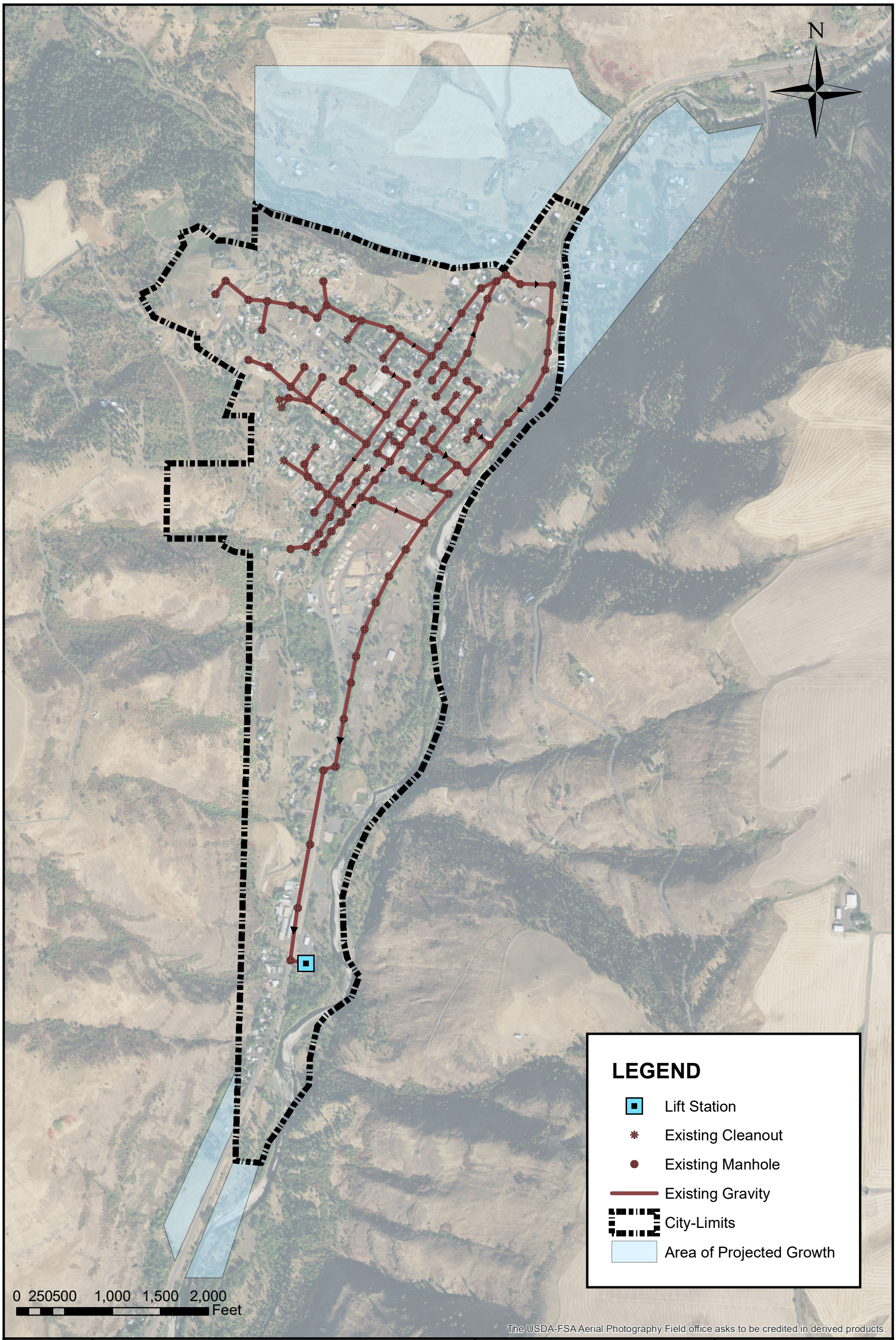


Figure:	Title:	Project: 218137	
3	**Future Growth Areas**	**Juliaetta WWTP**	KELLER ASSOCIATES

N

3

Force Main

Lift Station

2

1

Existing Lift Station

Force Main

Lift Station

4a

4b

0 250500 1,000 1,500 2,000 Feet

LEGEND

- CIP Project 1
- CIP Project 2
- CIP Project 3
- CIP Project 4a
- CIP Project 4b
- Existing
- City-Limits
- Area of Projected Growth

The USDA-FSA Aerial Photography Field office asks to be credited in derived products.

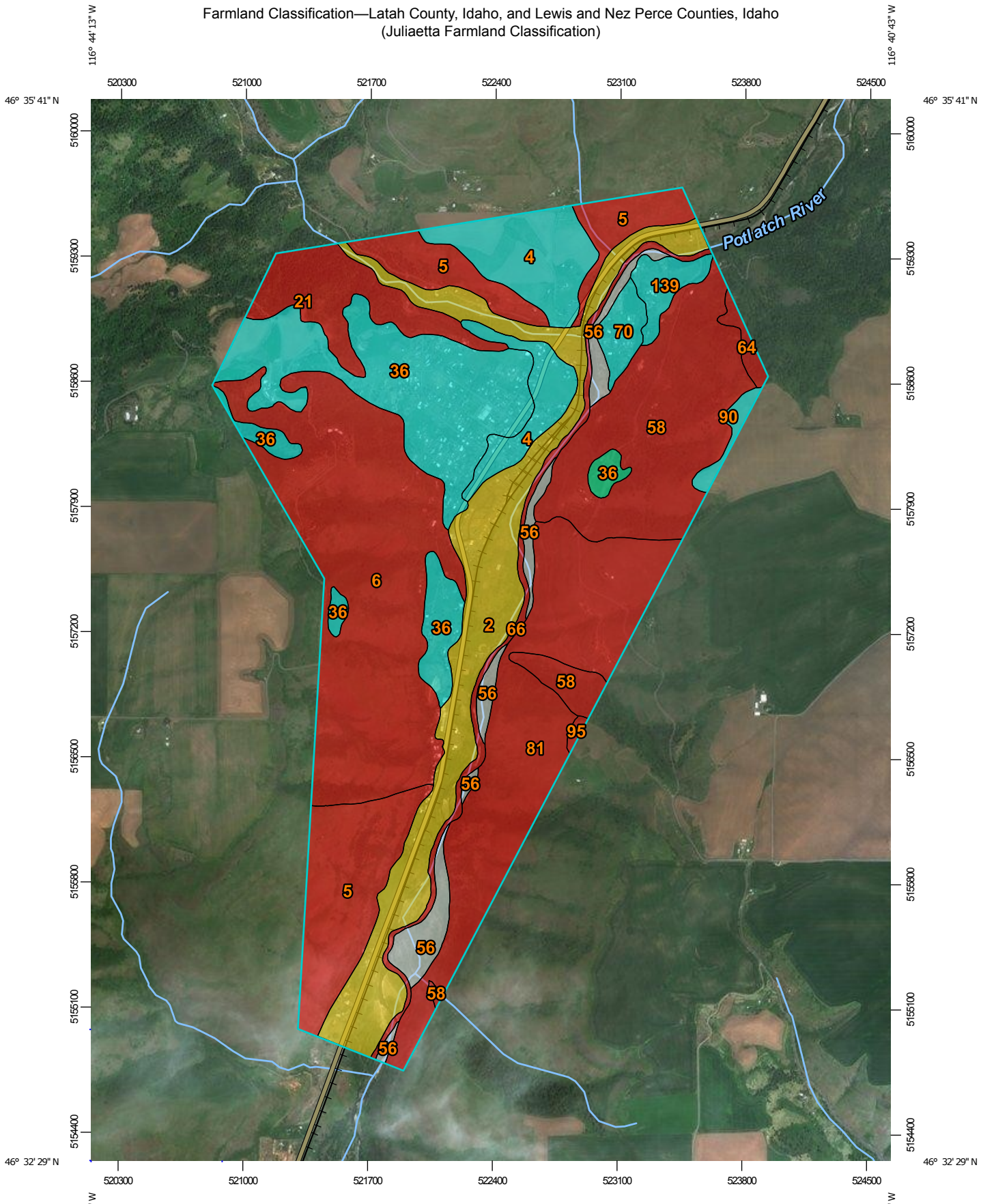
Figure:	Title:	Project: 218137	
4	**Collection System Master Plan**	**Juliaetta WWTP**	KELLER ASSOCIATES

APPENDIX B

NRCS Farmland Classification

KELLER ASSOCIATES

Farmland Classification—Latah County, Idaho, and Lewis and Nez Perce Counties, Idaho
(Juliaetta Farmland Classification)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

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: Latah County, Idaho
Survey Area Data: Version 8, Sep 13, 2018

Soil Survey Area: Lewis and Nez Perce Counties, Idaho
Survey Area Data: Version 18, Sep 13, 2018

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: Sep 11, 2009—Sep 14, 2016

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.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Aquic Xerofluvents, 0 to 3 percent slopes	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	278.1	13.1%
4	Athena-Palouse complex, 7 to 25 percent slopes	Farmland of statewide importance	132.4	6.2%
5	Bluesprin-Flybow complex, 35 to 65 percent slopes	Not prime farmland	215.4	10.1%
6	Bluesprin-Keuterville complex, 35 to 65 percent slopes	Not prime farmland	409.0	19.2%
21	Klickson cobbly ashy loam, 35 to 65 percent slopes	Not prime farmland	88.4	4.2%
36	Palouse silt loam, 7 to 25 percent slopes	Farmland of statewide importance	262.9	12.4%
66	Water	Not prime farmland	39.1	1.8%
Subtotals for Soil Survey Area			**1,425.4**	**67.0%**
Totals for Area of Interest			**2,126.6**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
36	Driscoll-Larkin complex, 2 to 10 percent slopes	Prime farmland if drained	9.7	0.5%
56	Joseph-Tombeall complex, 0 to 2 percent slopes, occasionally flooded	Farmland of statewide importance, if drained	64.1	3.0%
58	Kettenbach-Keuterville association, 35 to 75 percent slopes	Not prime farmland	258.9	12.2%
64	Klickson ashy silt loam, 35 to 90 percent slopes	Not prime farmland	10.4	0.5%
70	Lapwai-Bridgewater complex, 1 to 7 percent slopes	Farmland of statewide importance	23.5	1.1%
81	Linville-Kettenbach association, 45 to 75 percent slopes	Not prime farmland	294.9	13.9%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
90	Naff-Palouse complex, 8 to 20 percent slopes	Farmland of statewide importance	11.1	0.5%
95	Naff-Waha complex, 12 to 25 percent slopes	Not prime farmland	2.8	0.1%
139	Uhlig ashy silt loam, 8 to 20 percent slopes	Farmland of statewide importance	25.8	1.2%
Subtotals for Soil Survey Area			**701.3**	**33.0%**
Totals for Area of Interest			**2,126.6**	**100.0%**

Rating Options

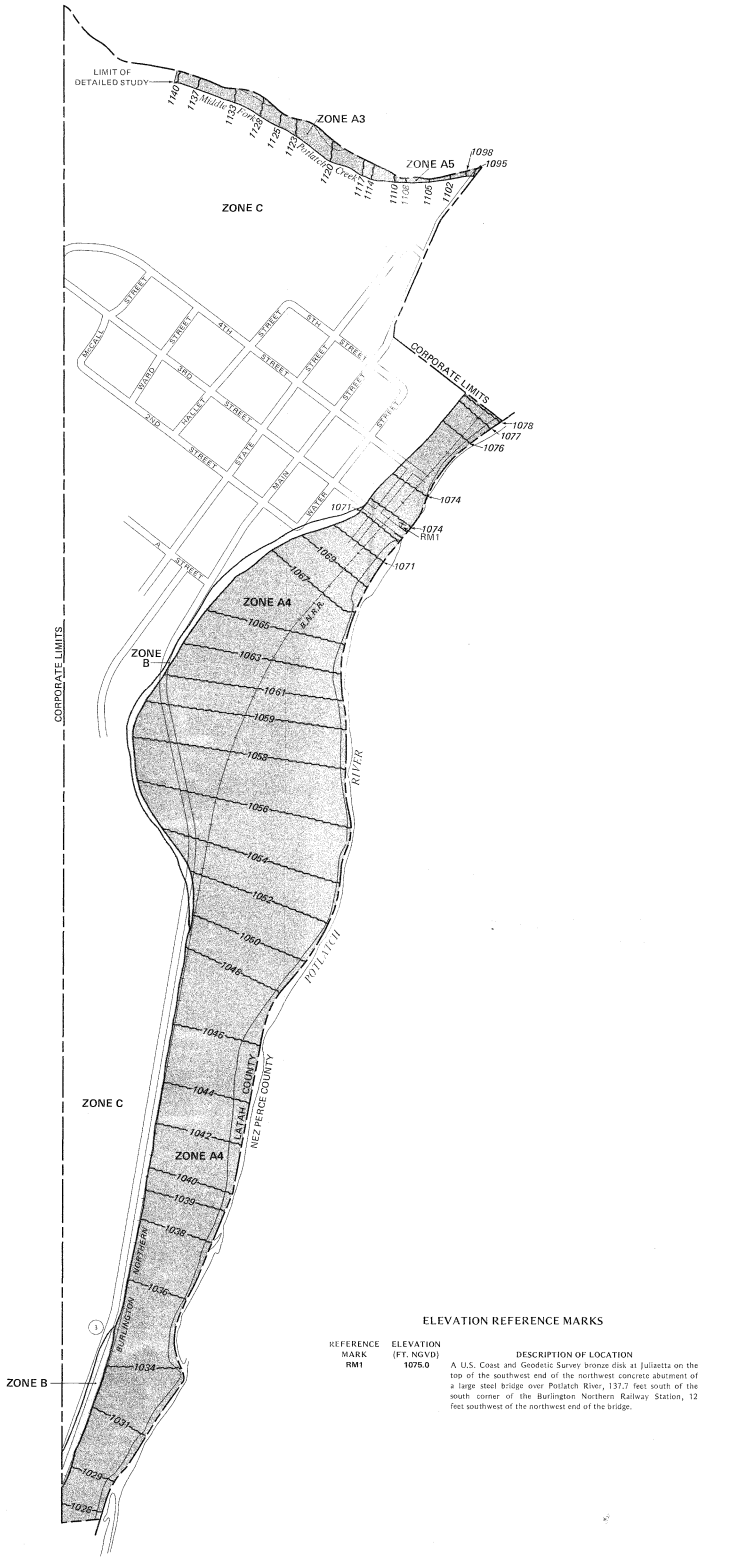
Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

APPENDIX C

FEMA Flood Map

KELLER ASSOCIATES



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM1	1075.0	A U.S. Coast and Geodetic Survey bronze disk at Juliaetta on the top of the southwest end of the northwest concrete abutment of a large steel bridge over Potlatch River, 137.7 feet south of the south corner of the Burlington Northern Railway Station, 12 feet southwest of the northwest end of the bridge.

KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	ZONE A1 DATE
Zone Designations* With Date of Identification e.g., 12/2/74	ZONE A5 DATE
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7 ×
River Mile	• M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

INITIAL IDENTIFICATION:
OCTOBER 18, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
DECEMBER 19, 1979

FLOOD INSURANCE RATE MAP EFFECTIVE:
MARCH 4, 1980

FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620, or (800) 424-8872.

APPROXIMATE SCALE
500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
JULIAETTA, IDAHO
LATAH COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
160088 0001 B

EFFECTIVE DATE:
MARCH 4, 1980

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

APPENDIX D

Wetlands Map

KELLER ASSOCIATES

U.S. Fish and Wildlife Service
National Wetlands Inventory

Project Area Wetlands Map

February 18, 2019

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.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

APPENDIX E

Biological Resources

KELLER ASSOCIATES

IPaC **U.S. Fish & Wildlife Service**

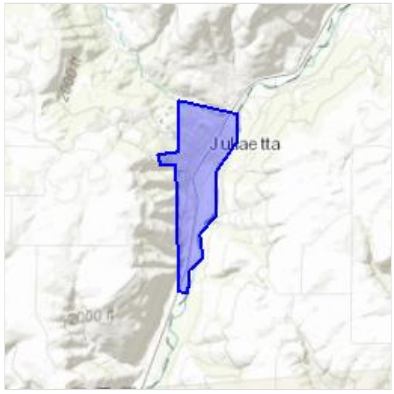
IPaC resource list

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

Latah and Nez Perce counties, Idaho



Local office

Idaho Fish And Wildlife Office

(208) 378-5243
(208) 378-5262

1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657

NOT FOR CONSULTATION

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.

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.
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:

Flowering Plants

NAME	STATUS
Spalding's Catchfly Silene spaldingii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3681	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].

NOT FOR CONSULTATION

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.

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 http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.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.

NOT FOR CONSULTATION

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
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. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Dec 1 to Aug 31
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31

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.

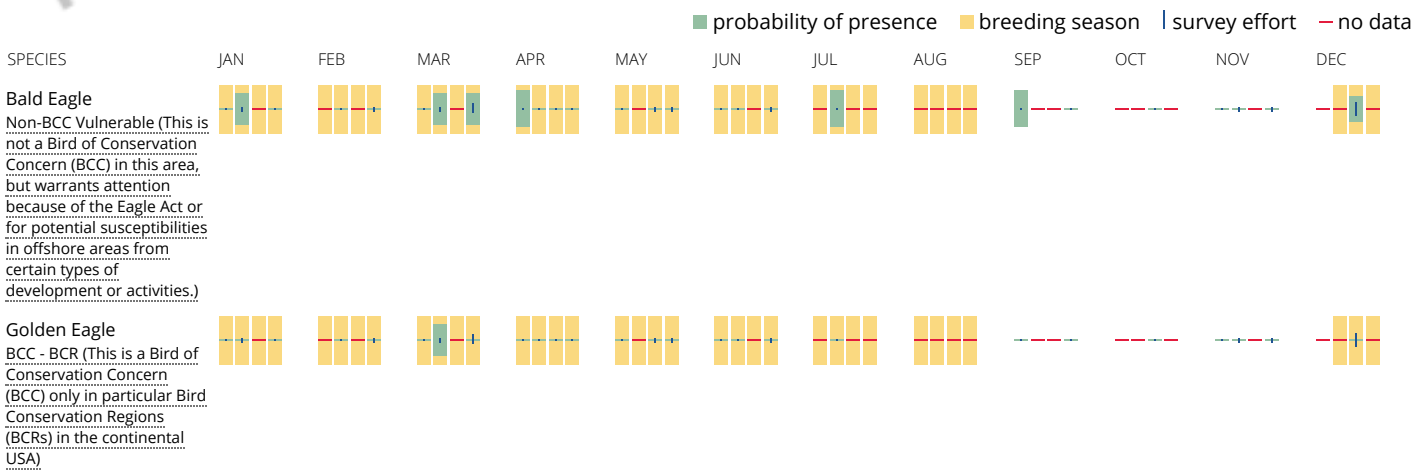
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

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.

NOT FOR CONSULTATION



Olive-sided Flycatcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

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 and/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 migratory birds potentially occurring 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 E-bird Explore Data 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, migrating or present year-round in my project 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 refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. 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.

NOT FOR CONSULTATION

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

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.

NOT FOR CONSULTATION

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.

NOT FOR CONSULTATION

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

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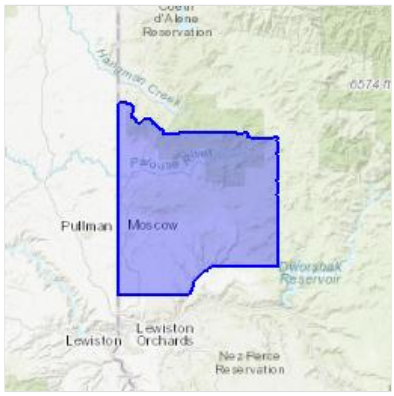
Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Latah County, Idaho



Local office

Idaho Fish And Wildlife Office

(208) 378-5243
(208) 378-5262

1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

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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.

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1. Draw the project location and click CONTINUE.
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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.

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.
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
North American Wolverine Gulo gulo luscus 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 is outside the critical habitat. https://ecos.fws.gov/ecp/species/8212	Threatened

Flowering Plants

NAME	STATUS

NOT FOR CONSULTATION

Spalding's Catchfly Silene spaldingii — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3681

Water Howellia Howellia aquatilis — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7090

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.

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 http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.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 (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES

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THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

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. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Black Swift Cypseloides niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
Brewer's Sparrow Spizella breweri This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10
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 Jan 1 to Dec 31
Golden Eagle Aquila chrysaetos This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Lewis's Woodpecker Melanerpes lewis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Long-billed Curlew Numenius americanus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds Apr 1 to Jul 31
Marbled Godwit Limosa fedoa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds May 1 to Jul 31
Olive-sided Flycatcher Contopus cooperi This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31

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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

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Williamson's Sapsucker Sphyrapicus thyroideus — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8832

Willow Flycatcher Empidonax traillii — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/3482

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

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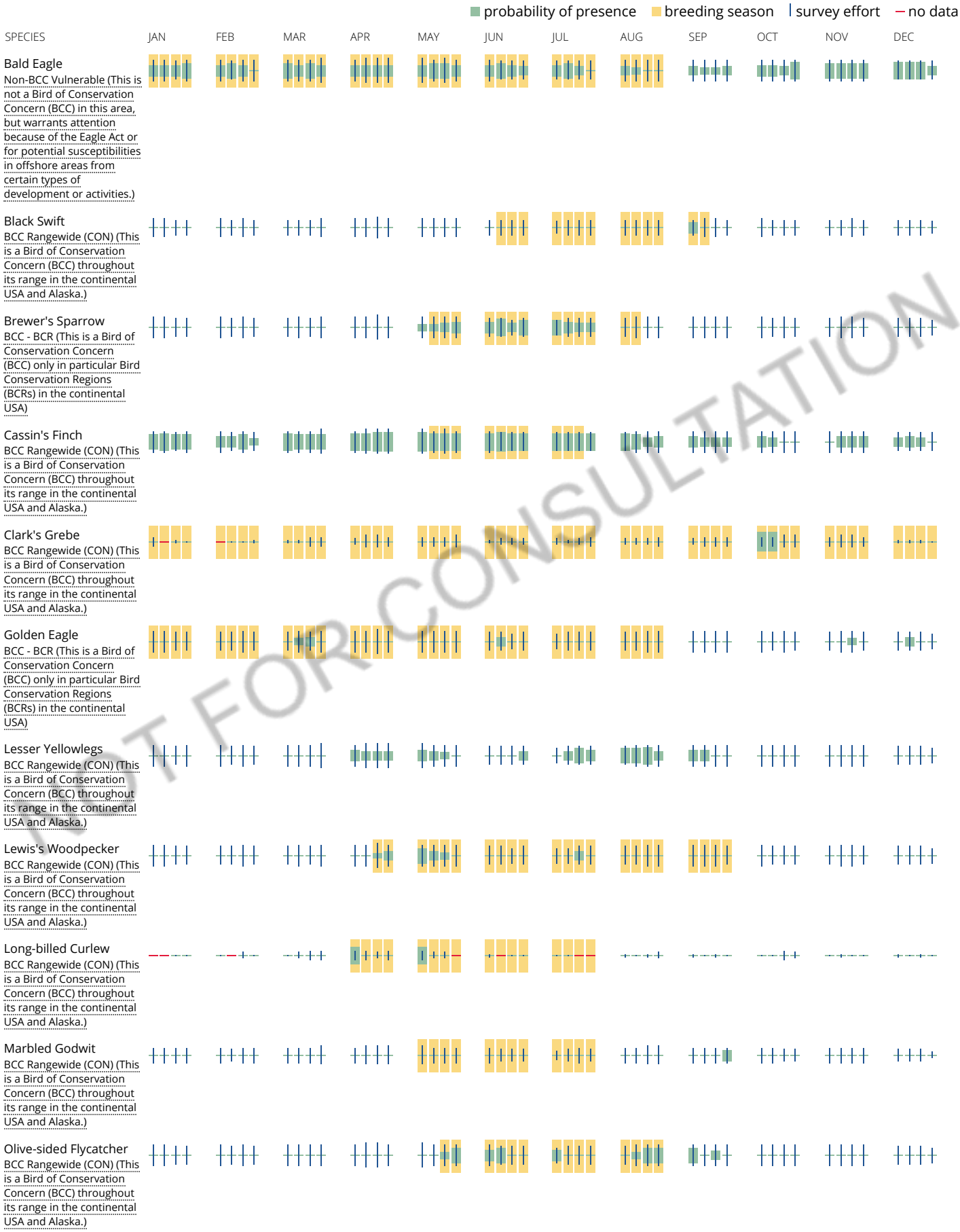
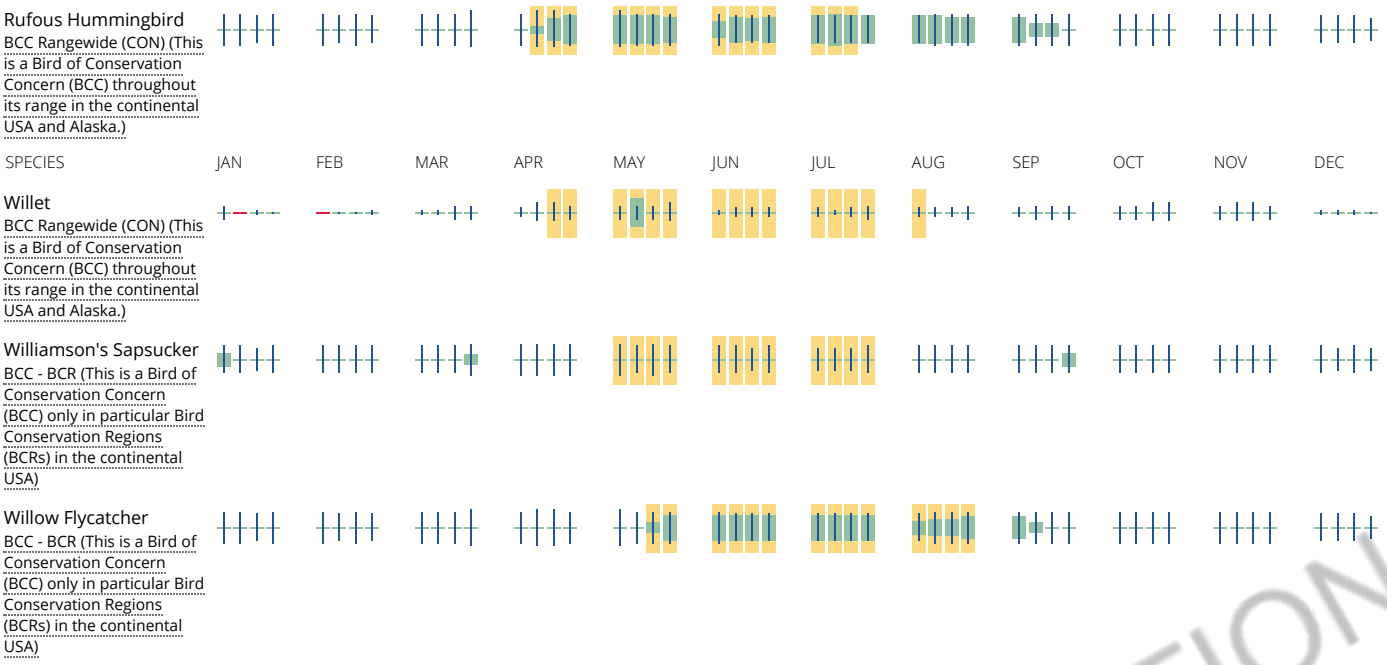
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



NOT FOR CONSULTATION



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 and/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 migratory birds potentially occurring 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 E-bird Explore Data 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, migrating or present year-round in my project 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 refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. 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:

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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.

NOT FOR CONSULTATION

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

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

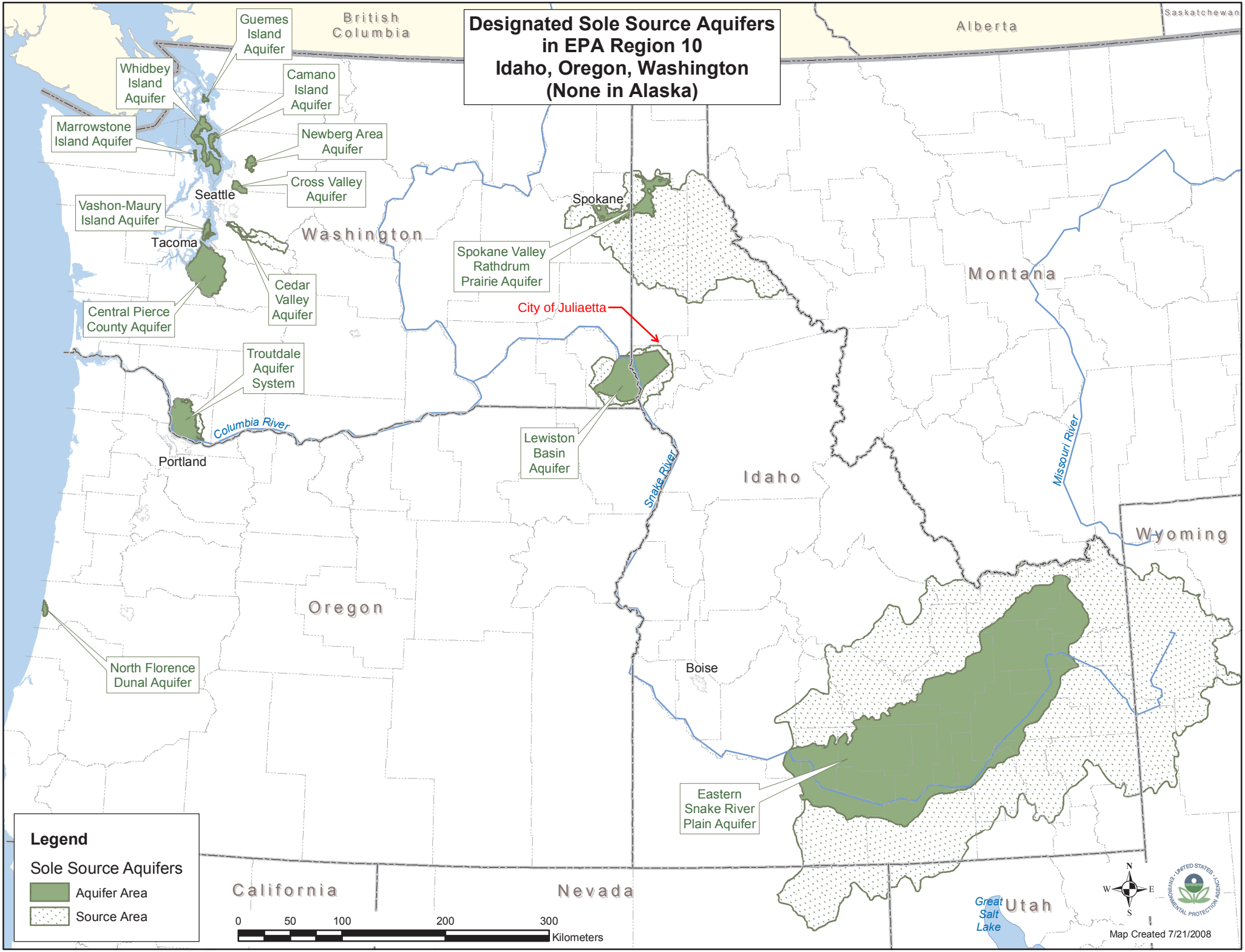
Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, 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.

NOT FOR CONSULTATION

APPENDIX F

Aquifer Map

KELLER ASSOCIATES

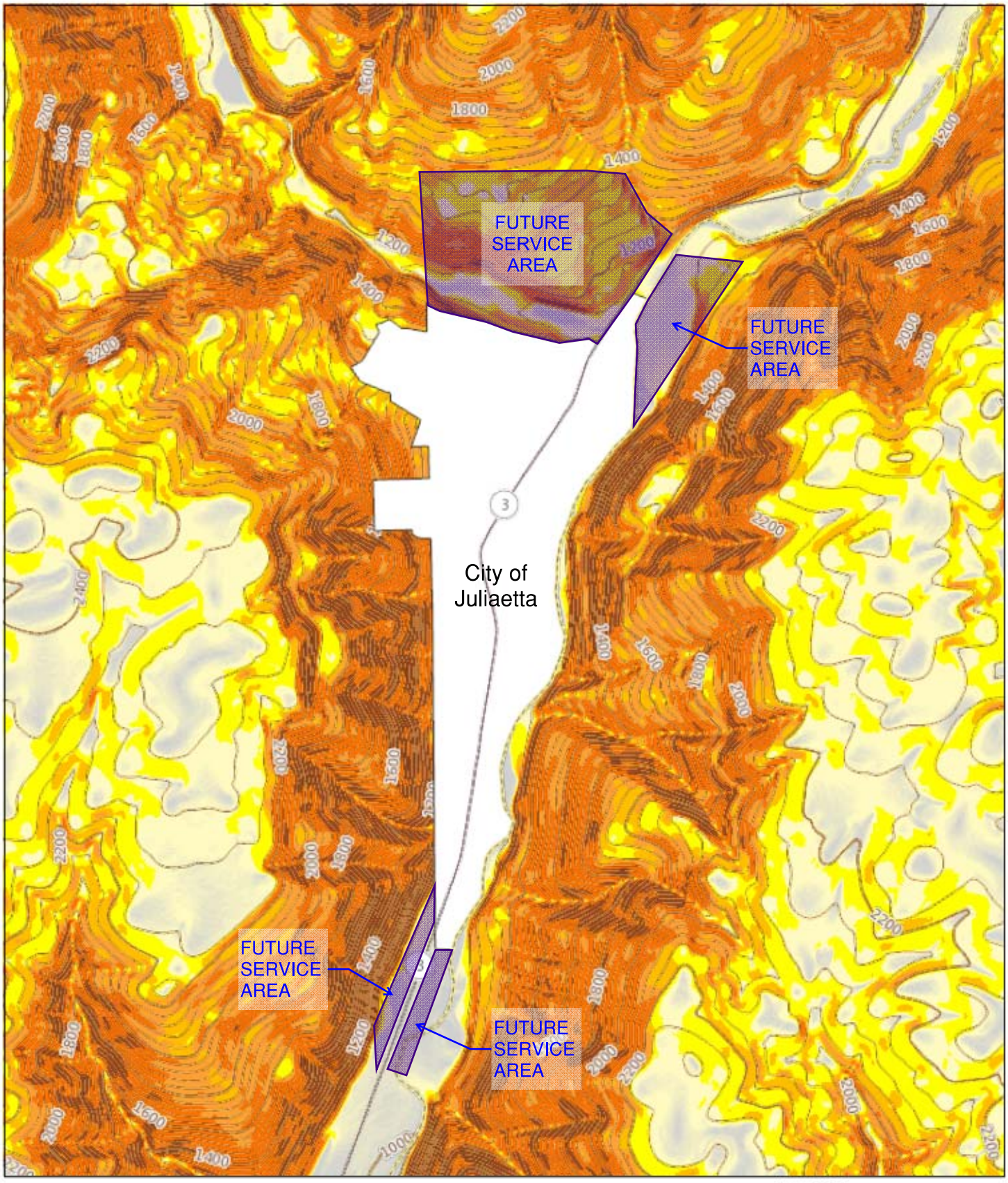

Designated Sole Source Aquifers
in EPA Region 10
Idaho, Oregon, Washington
(None in Alaska)
British Columbia
Alberta
Saskatchewan
Guemes Island Aquifer
Whidbey Island Aquifer
Camano Island Aquifer
Marrowstone Island Aquifer
Newberg Area Aquifer
Cross Valley Aquifer
Seattle
Vashon-Maury Island Aquifer
Tacoma
Washington
Spokane
Spokane Valley Rathdrum Prairie Aquifer
Montana
Cedar Valley Aquifer
Central Pierce County Aquifer
City of Juliaetta
Troutdale Aquifer System
Columbia River
Portland
Lewiston Basin Aquifer
Snake River
Idaho
Missouri River
Wyoming
Oregon
North Florence Dunal Aquifer
Boise
Eastern Snake River Plain Aquifer
California
Nevada
Utah
Great Salt Lake
Legend
Sole Source Aquifers
Aquifer Area
Source Area
0 50 100 200 300
Kilometers
N
W
E
S
Map Created 7/21/2008

APPENDIX G

USGS Slope Map

KELLER ASSOCIATES

Slope Map - Juliaetta & Surrounding Areas



5/17/2019, 3:47:49 PM

1:36,112

0 0.2 0.4 0.8 mi

0 0.33 0.65 1.3 km

Local Connecting Roads

State or Territory Large-Scale

County or Equivalent

Incorporated Place

Normal Intermediate Contours

Normal Index Contours

3DEP Elevation - Slope Map

Red: Band_1

Green: Band_2

Blue: Band_3

USGS The National Map: 3D Elevation Program. Data Refreshed April, 2019., USGS The National Map: National Transportation Dataset; U.S. Census Bureau – TIGER/Line; U.S. Forest Service. Data Refreshed April, 2019., Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO,

USGS

USGS The National Map: Orthoimagery | Garrity, C.P., Soller, D.R. | USGS National Map 3D Elevation Program (3DEP) | USGS National Map 3D Elevation Program (3DEP). Data refreshed July,

APPENDIX H

City Finances

KELLER ASSOCIATES

ACCOUNT TITLE	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020 (Projected)
Revenue							
Grant Revenue	$ -	$ -	$ -	$ -	$ -	$ 5,785.00	
Sewer Sales	$ 68,832.54	$ 72,411.72	$ 76,275.34	$ 79,332.02	$ 88,491.63	$ 96,212.35	$ 95,000.00
Service hook-up fee	$ -	$ -	$ 1,450.00	$ -	$ 1,700.00	$ -	
Service Charges	$ -	$ -	$ -	$ -	$ -	$ -	
Miscellaneous charges	$ -	$ -	$ (1.04)	$ -	$ -	$ -	
Sale of Asset	$ -	$ -	$ -	$ -	$ -	$ -	
Interest earnings	$ 20.91	$ 33.34	$ 83.25	$ 166.81	$ 321.01	$ 451.91	
Service hook-up fee	$ -	$ 1,450.00	$ -	$ 1,450.00	$ 1,700.00	$ -	
Service Charges	$ -	$ -	$ -	$ -	$ -	$ -	
Miscellaneous charges	$ -	$ -	$ -	$ -	$ -	$ -	
Other revenues	$ 53.26	$ -	$ -	$ -	$ -	$ 23.33	
Expenses							
Salaries	$ 30,873.78	$ 30,120.80	$ 38,541.72	$ 35,040.55	$ 36,397.71	$ 35,385.52	$ 38,000.00
Salary Adjustment	$ 845.46	$ 1,192.98	$ 1,540.86	$ 1,866.42	$ 2,292.06	$ 2,671.98	$ 1,800.00
Payroll expense - FICA	$ 2,838.93	$ 2,398.37	$ 2,717.85	$ 3,153.10	$ 2,893.13	$ 2,911.18	$ 3,500.00
Payroll expense - PERSI	$ 3,217.22	$ 2,527.91	$ 2,865.77	$ 4,742.24	$ 2,762.49	$ 3,877.06	$ 4,500.00
Payroll expense-Workman's Comp	$ -	$ 681.76	$ 682.61	$ 897.10	$ 867.68	$ 452.78	$ 1,500.00
Payroll expense - Other	$ 0.04	$ -	$ 1,509.33	$ (2,134.20)	$ -	$ -	$ 100.00
Medical Insurance	$ 4,808.98	$ 5,255.11	$ 5,740.54	$ 4,983.92	$ 3,540.22	$ 4,458.92	$ 6,500.00
Legal fees	$ -	$ -	$ 132.00	$ -	$ -	$ -	$ 200.00
Accounting fees	$ 1,800.00	$ 2,000.00	$ 2,050.00	$ 2,150.00	$ 2,450.00	$ 2,550.00	$ 5,500.00
Other Professional fees	$ 90.00	$ 120.00	$ 120.00	$ 207.50	$ 212.00	$ 499.76	$ 1,000.00
Legal Publications	$ -	$ -	$ -	$ -	$ -	$ -	$ 100.00
Printing and binding	$ -	$ -	$ -	$ -	$ -	$ -	$ 100.00
Phone	$ 768.90	$ 794.69	$ 729.31	$ 649.59	$ 312.50	$ 472.12	$ 500.00
Meeting and Travel	$ 830.28	$ 296.06	$ 720.74	$ 1,834.45	$ 1,041.45	$ 408.64	$ 2,000.00
Dues	$ 15.00	$ 30.00	$ 30.00	$ 385.00	$ 195.00	$ 195.00	$ 500.00
Insurance	$ 3,537.75	$ 2,724.24	$ 2,751.50	$ 2,751.50	$ 2,751.50	$ 2,889.00	$ 3,300.00
Avista	$ 8,118.91	$ 9,641.07	$ 9,109.82	$ 9,003.60	$ 8,626.56	$ 8,373.42	$ 11,000.00
Miscellaneous	$ 1,136.50	$ 145.71	$ 54.13	$ 66.19	$ 11.50	$ 33.98	$ 500.00
Supplies	$ 1,656.21	$ 993.41	$ 1,471.54	$ 1,184.13	$ 913.90	$ 5,390.53	$ 2,600.00
Equipment Repairs	$ 1,972.86	$ 1,697.29	$ 729.49	$ 4,531.40	$ 1,171.77	$ 544.94	$ 4,800.00
Auto Fuel	$ 1,503.81	$ 1,138.68	$ 799.53	$ 1,127.62	$ 1,156.20	$ 1,077.91	$ 1,500.00
System Repairs	$ 624.68	$ 6,925.32	$ 2,109.55	$ 3,706.66	$ 1,208.22	$ 2,411.73	$ 6,000.00
Vehicle Repairs	$ 4.41	$ 187.15	$ 429.98	$ 998.14	$ 452.42	$ 1,203.47	$ 500.00
Equipment Rental	$ -	$ -	$ 57.00	$ -	$ -	$ -	$ 100.00
Office Expense	$ 400.85	$ 472.80	$ 150.07	$ 27.82	$ 191.24	$ 111.93	$ 400.00
Treatment supplies	$ 3,461.90	$ 6,286.46	$ 8,013.80	$ 5,057.65	$ 4,728.44	$ 2,566.96	$ 9,700.00
Interest expense	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Engineering	$ -	$ -	$ -	$ -	$ -	$ 5,785.00	$ -
Depreciation expense	$ 24,043.00	$ 24,773.00	$ 25,017.00	$ 14,643.00	$ 4,045.00	$ -	$ -
Amortization	$ -	$ -	$ -	$ -	$ -	$ -	$ 23,226.00
Lease payments	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Bad Debt Expense	$ -	$ -	$ -	$ 30.00	$ -	$ -	$ -
Testing	$ 2,349.16	$ 1,558.29	$ 1,258.00	$ 850.00	$ 950.00	$ 2,088.40	$ 3,900.00
New Hook-up expense	$ -	$ -	$ -	$ -	$ 533.06	$ -	$ 1,000.00
Restock	$ 148.58	$ -	$ 246.78	$ 842.18	$ 585.68	$ -	$ 600.00
Sludge Disposal	$ 1,034.31	$ 591.71	$ 2,045.25	$ 323.96	$ -	$ -	$ 3,000.00
Equipment Fuel	$ 1.78	$ 81.96	$ 251.56	$ 256.64	$ 44.68	$ 72.78	$ 300.00
Sewer Upgrade	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,000.00
Safety Equiptment	$ -	$ -	$ -	$ -	$ -	$ -	$ 500.00
Capital Outlay	$ -	$ -	$ 99.87	$ -	$ -	$ 10,496.48	$ 11,000.00
Revenue	$ 68,906.71	$ 73,895.06	$ 77,807.55	$ 80,948.83	$ 92,212.64	$ 102,472.59	$ 95,000.00
O&M Expenses	$ 96,083.30	$ 102,634.77	$ 111,975.60	$ 99,176.16	$ 80,334.41	$ 96,929.49	$ 152,726.00
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Account Title	2020 Budget	2020 Actual Costs	Net Income
Property taxes - General	0	866.22	-866.22
Property taxes - Penalty	135,074.00	17.29	135,056.71
Property taxes - Interest	0	256.84	-256.84
Property Taxes - Personal	0	0	0
Sales tax -inventory phase out	18,959.00	5,214.25	13,744.75
Fees from license plates, ect.	0	0	0
Highway to City	0	126.83	-126.83
Gross electric tax	0	0	0
Franchise fee	0	0	0
State Agr.	0	9.25	-9.25
Liquor apportionment	23,186.00	4,782.00	18,404.00
Highway user	21,334.00	0	21,334.00
Highway user Reserve	6,677.00	0	6,677.00
Sales tax	0	0	0
Revenue sharing	23,934.00	13,742.42	10,191.58
Grant revenue - ICDBG	0	0	0
Grant revenue - EDA	0	0	0
Transportation Plan Grant	0	0	0
Cemetary Plots	0	0	0
Dog Tags	0	0	0
TV Collections	0	0	0
Interest earnings	4,000.00	11.67	3,988.33
Interest earnings Com. Library	0	4.7	-4.7
Business licenses and permits	500	0	500
Non-business lic. & permits	0	0	0
Other revenues	0	0	0
Building permits	0	0	0
City Donations Com. Library	0	0	0
Public Donations Com. Library	0	1,023.75	-1,023.75
Raffle Sales Com Library Fund	0	0	0
Lighting of the park CLP	0	0	0
Dog Tags	0	0	0
Sale of Asset	0	0	0
Franchise fee	0	0	0
TV Collections	0	30	-30
Cash Carryover	293,682.00	0	293,682.00
Donated Revenue	0	0	0
Salaries	31,000.00	4,583.49	26,416.51
Salary Adjustment	4,400.00	245.68	4,154.32
Payroll expense - FICA	2,700.00	369.46	2,330.54
Payroll expense - PERSI	3,600.00	483.99	3,116.01
Payroll expense-Workman's Comp	1,500.00	0	1,500.00
Payroll expense - Other	1,000.00	427.13	572.87
Medical Insurance	0	710.28	-710.28
Legal fees	8,600.00	0	8,600.00
Accounting fees	11,000.00	0	11,000.00

Account Title	2020 Budget	2020 Actual Costs	Net Income
Other Professional fees	1,200.00	0	1,200.00
Legal Publications	2,000.00	136.8	1,863.20
Printing and binding	400	0	400
Phone	4,000.00	151.14	3,848.86
Meeting and Travel	3,500.00	472.83	3,027.17
Dues	1,300.00	493	807
Insurance	4,000.00	1,473.38	2,526.62
Avista	5,800.00	411.14	5,388.86
Building Repairs	1,500.00	0	1,500.00
Miscellaneous	1,200.00	27.52	1,172.48
Supplies	3,000.00	90.44	2,909.56
Office Expense	1,300.00	257.05	1,042.95
Tools	600	0	600
J_K Recreational	1,000.00	0	1,000.00
Codifing Ordinances	700	200	500
Computer	6,000.00	0	6,000.00
Trail	1,000.00	0	1,000.00
Flowers	600	0	600
Juliaetta TV	0	0	0
Pool	500	0	500
KJ7 Sponsorship	50	0	50
J-K Heritage Foundation	50	50	0
Festival	500	0	500
Christmas Lights	1,000.00	462.36	537.64
Christmas Candy	300	0	300
Supplies Fundraising CLP	0	0	0
Capital Outlay	0	0	0
Avista	700	378.5	321.5
Building Repairs	500	0	500
Miscellaneous	200	0	200
Supplies	300	0	300
Capital Outlay	1,000.00	0	1,000.00
Salaries	0	0	0
Salary Adjustment	0	0	0
Payroll expense - FICA	0	0	0
Payroll expense - PERSI	0	0	0
Payroll expense-Workman's Comp	300	0	300
Payroll expense - Other	0	0	0
Phone	900	216.36	683.64
Meeting and Travel	400	0	400
Insurance	0	0	0
Avista	1,000.00	265.22	734.78
PPE	2,800.00	0	2,800.00
Communications	2,400.00	2,203.25	196.75
Supplies	3,700.00	346.95	3,353.05
Maintenance/Repair	1,300.00	0	1,300.00

Account Title	2020 Budget	2020 Actual Costs	Net Income
Auto Fuel	800	0	800
Fittings, Appliances & Hose	5,000.00	0	5,000.00
Vehicle Repairs	6,100.00	0	6,100.00
Office Expense	0	0	0
Internet	100	0	100
Police	8,650.00	1,600.00	7,050.00
Fire Department	0	0	0
Capital Outlay	200	0	200
Salaries	30,000.00	5,028.84	24,971.16
Salary Adjustment	0	0	0
Payroll expense - FICA	2,600.00	384.72	2,215.28
Payroll expense - PERSI	3,600.00	574.49	3,025.51
Payroll expense-Workman's Comp	2,000.00	0	2,000.00
Payroll expense - Other	100	0	100
Medical Insurance	6,500.00	607.74	5,892.26
Other Professional fees	1,000.00	0	1,000.00
Phone	400	107.2	292.8
Meeting and Travel	0	0	0
Insurance	3,200.00	1,473.37	1,726.63
Avista	12,500.00	1,751.27	10,748.73
Miscellaneous	500	0	500
Supplies	800	254.23	545.77
Equipment Repairs	5,000.00	34.8	4,965.20
Auto Fuel	2,800.00	204.64	2,595.36
Street Repairs	20,000.00	0	20,000.00
Vehicle Repairs	1,000.00	0	1,000.00
Office Expense	500	31.8	468.2
Gravel	1,000.00	124.41	875.59
Sidewalks	2,000.00	0	2,000.00
Snow Removal	3,500.00	218.21	3,281.79
Tree Trimming	1,300.00	0	1,300.00
Storm Drain	2,000.00	1,891.82	108.18
New Pickup	0	0	0
Weed Spray	700	0	700
New Mower	4,500.00	0	4,500.00
Signs	400	0	400
Street Sweeper	500	0	500
Equipment Fuel	1,700.00	180.19	1,519.81
Capital Outlay	11,000.00	0	11,000.00
Salaries	2,900.00	43.3	2,856.70
Salary Adjustment	0	0	0
Payroll expense - FICA	250	3.32	246.68
Payroll expense - PERSI	0	0	0
Payroll expense-Workman's Comp	600	0	600
Payroll expense - Other	0	0	0
Meeting and Travel	0	0	0

Account Title	2020 Budget	2020 Actual Costs	Net Income
Avista	2,400.00	463.84	1,936.16
Building Repairs	2,800.00	91.9	2,708.10
Miscellaneous	800	0	800
Supplies	500	211.1	288.9
Equipment Repairs	500	34.8	465.2
Weed Spray	1,500.00	0	1,500.00
Trail	1,000.00	0	1,000.00
Park Maintenance	4,500.00	0	4,500.00
Park Upkeep	0	459.64	-459.64
Lights Park	300	0	300
Park Tables	0	0	0
Equipment Fuel	500	104.65	395.35
Capital Outlay	11,000.00	0	11,000.00
Engineering	0	0	0
Community Block Grant	0	0	0
USDA	0	0	0
Water Sales	183,500.00	27,837.57	155,662.43
Service turn-on fee	0	0	0
Service hook-up fee	0	0	0
Delinquent fee	0	0	0
Miscellaneous charges	0	25	-25
Sale of Asset	0	0	0
Interest earnings	0	0	0
Service turn-on fee	0	0	0
Service hook-up fee	0	0	0
Delinquent fee	0	0	0
Water tests	0	0	0
Service Charges	0	0	0
Miscellaneous charges	0	0	0
Other revenues	0	0	0
Sale of Asset	0	0	0
Operating transfer in	0	0	0
Operating transfer in	0	0	0
Salaries	38,000.00	7,165.36	30,834.64
Salary Adjustment	2,500.00	122.84	2,377.16
Payroll expense - FICA	3,200.00	557.59	2,642.41
Payroll expense - PERSI	4,200.00	823.07	3,376.93
Payroll expense-Workman's Comp	2,000.00	0	2,000.00
Payroll expense - Other	1,000.00	0	1,000.00
Medical Insurance	5,000.00	962.89	4,037.11
Legal fees	500	0	500
Accounting fees	5,500.00	0	5,500.00
Other Professional fees	500	0	500
Legal Publications	500	0	500
Printing and binding	500	0	500
Phone	850	177.92	672.08

Account Title	2020 Budget	2020 Actual Costs	Net Income
Meeting and Travel	2,000.00	0	2,000.00
Dues	1,000.00	0	1,000.00
Insurance	3,300.00	1,473.37	1,826.63
Avista	22,000.00	2,548.31	19,451.69
Miscellaneous	500	0	500
Supplies	1,500.00	809.7	690.3
Equipment Repairs	3,000.00	0	3,000.00
Auto Fuel	1,500.00	166.56	1,333.44
System Repairs	12,000.00	190.1	11,809.90
Water Line System Repairs	73,150.00	0	73,150.00
Vehicle Repairs	500	0	500
Equipment Rental	200	0	200
Office Expense	500	0	500
Treatment supplies	6,000.00	156.31	5,843.69
Interest expense	0	0	0
Bank Charges	100	12	88
Depreciation expense	76,946.00	0	76,946.00
Amortization	65,840.00	0	65,840.00
Lease payments	0	0	0
Bad Debt Expense	0	0	0
Testing	7,000.00	50	6,950.00
New Hook-up expense	1,000.00	0	1,000.00
Restock	2,000.00	81.9	1,918.10
DEQ	1,144.00	0	1,144.00
Equipment Fuel	100	13.63	86.37
Meters	1,000.00	0	1,000.00
Well Repair	1,000.00	0	1,000.00
Reservoir Cleaning	4,000.00	0	4,000.00
Capital Outlay	11,000.00	0	11,000.00
Grant Revenue	0	0	0
Sewer Sales	95,000.00	17,326.19	77,673.81
Service hook-up fee	0	0	0
Service Charges	0	0	0
Miscellaneous charges	0	0	0
Sale of Asset	0	0	0
Interest earnings	0	0	0
Service hook-up fee	0	0	0
Service Charges	0	0	0
Miscellaneous charges	0	0	0
Other revenues	0	0	0
Salaries	38,000.00	6,612.04	31,387.96
Salary Adjustment	1,800.00	122.84	1,677.16
Payroll expense - FICA	3,500.00	515.12	2,984.88
Payroll expense - PERSI	4,500.00	763.49	3,736.51
Payroll expense-Workman's Comp	1,500.00	0	1,500.00
Payroll expense - Other	100	0	100

Account Title	2020 Budget	2020 Actual Costs	Net Income
Medical Insurance	6,500.00	963.05	5,536.95
Legal fees	200	0	200
Accounting fees	5,500.00	0	5,500.00
Other Professional fees	1,000.00	1,116.00	-116
Legal Publications	100	0	100
Printing and binding	100	0	100
Phone	500	177.94	322.06
Meeting and Travel	2,000.00	0	2,000.00
Dues	500	0	500
Insurance	3,300.00	1,473.38	1,826.62
Avista	11,000.00	1,442.05	9,557.95
Miscellaneous	500	0	500
Supplies	2,600.00	227.19	2,372.81
Equipment Repairs	4,800.00	0	4,800.00
Auto Fuel	1,500.00	166.57	1,333.43
System Repairs	6,000.00	165.25	5,834.75
Vehicle Repairs	500	0	500
Equipment Rental	100	0	100
Office Expense	400	0	400
Treatment supplies	9,700.00	0	9,700.00
Interest expense	0	0	0
Engineering	0	0	0
Depreciation expense	0	0	0
Amortization	23,226.00	0	23,226.00
Lease payments	0	0	0
Bad Debt Expense	0	0	0
Testing	3,900.00	0	3,900.00
New Hook-up expense	1,000.00	0	1,000.00
Restock	600	0	600
Sludge Disposal	3,000.00	0	3,000.00
Equipment Fuel	300	13.63	286.37
Sewer Upgrade	3,000.00	0	3,000.00
Safety Equiptment	500	0	500
Capital Outlay	11,000.00	0	11,000.00
Sales Tax	0	0	0
Service Charges	0	0	0
Garbage Sales	90,000.00	15,150.75	74,849.25
Service Charges	0	0	0
Interest Earnings	0	0	0
Bad Debt Expense	0	0	0
Collection expense	0	0	0
Other Professional Fees	4,000.00	0	4,000.00
Meeting and Travel	0	0	0
Office Expense	500	70	430
Bad Debt Expense	0	0	0
Collection expense	83,790.00	9,325.70	74,464.30

APPENDIX I

Potlatch River Flow Data

KELLER ASSOCIATES

JULIAETTA WASTEWATER TREATMENT FACILITY

MONTHLY OPERATION RECORDS MONTH OF March 2017

DAY	LIFT STATION HOUR PUMP 1 (Hours)	PUMP 2 (Hours)	TOTAL LIFT STATION PUMP HOURS	DAILY VOL. PUMP BY LIFT STATION (GAL/24 Hrs)	EFFLUENT TOTALIZER READING (DAILY) (Gal.)	EFFLUENT FLOW (DAILY) (Gal./24 Hrs.)	CHLORINE FEED PRES. (DAILY) (lb./psi)	CHLORINE WEIGHT (DAILY) (Lb.)	CHLORINE (DAILY) (Lb./24 Hr.s)	SLUDGE WASTING TIME	BLOWER OUT PUT (DAILY) (CFM)
1	39192.6	16576.4	6.9	62,100	3650064	56,100		18	10		260 36°
2	39198.6	16576.6	6.1	54900	3650064	48,900		40 8	10	8:30AM 12:30PM	260 37°
3	39204.7	16577.7	7.2	64,000	3650060	58,800		31	9		255 39°
4	39210.0	16580.4	8.0	72,000	3650060	66,000		22	8		255 37°
5	39215.4	16583.1	8.1	72,900	3650060	66,900		14	8		260 38°
6	39222.8	16585.8	10.1	90,900	3650060	84,900		45 5	9		260 33°
7	39234.6	16588.0	14.0	126,000	3650055	120,000		36	9		250 40°
8	39246.4	16590.3	14.1	126,900	3650055	120,900		27	9		240 41°
9	39252.0	16594.8	10.1	90,900	3650050	84,900		18	9		250 39°
10	39259.1	16598.7	11.0	99,000	3650030	93,000		40 8	10		230 40°
11	39271.0	16598.7	11.9	107,100	3650020	101,100		32	8		230 41°
12	39282.9	16598.7	11.9	107,100	3650010	101,100		24	8		220 42°
13	39294.9	16598.7	11.9	107,100	3650000	101,100		40 16	8	11:15 AM 2:00 PM	220 43°
14	39302.8	16601.4	10.6	95,400	3650000	89,400		32	8		220 45°
15	39315.4	16601.4	12.6	113400	3650000	107,400		22.5	9.5		225 47°
16	39333.9	16601.4	20.5	184500	3650000	178500	12.5	36-13	9.5		225 46°
17	39358.6	16601.4	22.7	204,300	3650000	198,300		30	9.6		255 38°
18	39382.8	16601.4	24.2	217,800	3649970	211,800		21	9		255 36°
19	39407.0	16601.4	24.2	217,800	3649970	211,800		12	9		250 40°
20	39431.3	16601.4	24.3	218,700	3659970	212,700		40 3	9		250 42°
21	39453.1	16602.6	23.0	207,000	3659970	201,000		33	7		220 48°
22	39458.1	16606.7	9.1	81,900	3659990	75,900		24	9		220 44°
23	39463.0	16609.9	8.1	72,900	3659980	66,900		16	8		235 40°
24	39468.1	16613.1	8.3	74,700	3659980	68,700		39 7	9		220 46°
25	39475.9	16613.7	8.4	75,600	3659975	69,600		27	7		220 45°
26	39483.7	16614.3	8.4	75,600	3659970	69,600		20	7		215 45°
27	39491.5	16614.9	8.4	75,600	3649965	69,600		45 13	8		215 44°
28	39495.8	16618.5	7.9	71,100	3649965	65,100		34	9		250 39°
29	39499.9	16621.7	7.3	65,700	3649965	59,700		25	9		245 43°
30	39504.8	16625.3	8.5	76,500	3649965	70,500		16	9	10:10 AM 2:00 PM	220 47°
31	39510.5	16629.0	9.4	84,600	3649965	78,600		39 7	9		255 37°

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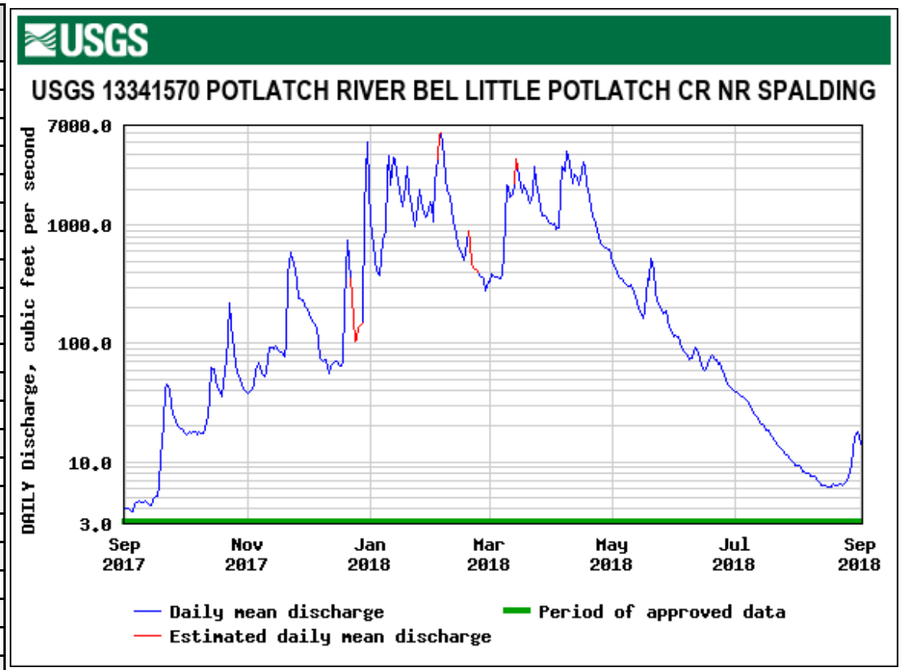
DAILY MEAN DISCHARGE (cfs)

DATE	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	Jun 2018	Jul 2018	Aug 2018	Sept 2018
1	17.5	37.40	176	1,060	1,060	330	996	484	116	39.4	9.3	14
2	17.0	38.5	161.0	675.0	2310.0	384.0	1050.0	439.0	113.0	37.3	8.7	12.5
3	17.7	40.9	155.0	515.0	3660.0	365.0	931.0	399.0	102.0	36.9	8.2	11.5
4	17.6	45.0	150.0	411.0	5900.0	362.0	945.0	368.0	93.1	35.8	8.2	10.9
5	17.8	59.0	131.0	378.0	6010.0	363.0	1820.0	351.0	88.4	35.1	8.1	10.4
6	17.8	67.9	103.0	525.0	3760.0	350.0	3160.0	335.0	82.7	33.4	7.9	10.1
7	16.8	63.5	75.0	755.0	2500.0	378.0	2850.0	320.0	77.2	31.3	7.7	9.7
8	17.7	56.4	70.1	897.0	1980.0	580.0	4170.0	307.0	72.6	29.1	7.6	9.4
9	17.3	53.3	73.9	2710.0	1710.0	2200.0	3870.0	307.0	74.1	27.0	7.4	9.4
10	17.2	56.0	71.9	3910.0	1390.0	2080.0	2730.0	314.0	84.2	25.0	7.2	9.2
11	19.3	76.1	55.9	2180.0	1080.0	1750.0	2250.0	273.0	91.4	23.9	6.6	9.0
12	23.9	91.6	62.2	3700.0	877.0	1830.0	2660.0	246.0	81.9	22.7	6.4	9.2
13	34.9	93.5	65.8	3510.0	661.0	2290.0	2530.0	218.0	72.1	21.5	6.3	9.4
14	63.3	90.5	70.0	2750.0	648.0	3620.0	2200.0	194.0	64.5	20.6	6.4	9.8
15	61.7	94.8	71.6	1990.0	556.0	3070.0	2450.0	176.0	59.9	19.5	6.2	9.9
16	50.0	87.9	67.5	1630.0	501.0	2200.0	3410.0	165.0	60.4	18.6	6.1	10.1
17	43.2	85.2	64.8	1430.0	584.0	1900.0	3020.0	190.0	66.5	18.3	6.2	10.4
18	38.0	84.0	71.6	2180.0	888.0	2160.0	2230.0	353.0	74.4	17.0	6.5	10.6
19	35.3	76.4	215.0	3090.0	724.0	1900.0	1700.0	341.0	79.2	16.3	6.3	10.4
20	45.5	98.6	755.0	1940.0	468.0	1660.0	1380.0	516.0	75.0	15.1	6.2	10.3
21	73.2	383.0	498.0	1440.0	439.0	1530.0	1180.0	427.0	72.2	14.3	6.5	10.4
22	113.0	596.0	360.0	1180.0	424.0	1830.0	1030.0	268.0	66.9	13.8	6.5	10.5
23	221.0	505.0	250.0	990.0	401.0	3170.0	901.0	231.0	69.7	13.1	6.3	10.8
24	144.0	477.0	104.0	1490.0	377.0	2340.0	783.0	204.0	60.7	12.4	6.6	10.6
25	87.9	330.0	109.0	2010.0	362.0	1730.0	709.0	193.0	53.5	11.7	6.9	10.7
26	66.3	239.0	135.0	1610.0	342.0	1390.0	671.0	177.0	48.7	11.4	7.4	10.9
27	55.8	241.0	143.0	1260.0	283.0	1220.0	650.0	191.0	45.6	10.8	9.7	11.0
28	49.2	233.0	148.0	1160.0	333.0	1200.0	639.0	159.0	42.5	10.4	12.0	10.9
29	44.8	207.0	1400.0	1200.0		1170.0	619.0	135.0	41.2	9.8	16.4	11.0
30	41.8	199.0	5090.0	1600.0		1060.0	548.0	121.0	40.4	9.4	18.2	11.1
31	39.3		2080.0	1450.0		1040.0		115.0		9.2	16.4	

Total	31	30	31	31	28	31	30	31	30	31	31	30
Mean	49.2	160	419	1665	1437	1531	1803	275	72.3	21.0	8.27	10.5
Max	221	596	5090	3910	6010	3620	4170	516	116	39.4	18.2	14
Min	16.8	37.4	55.9	378	283	330	548	115	40.4	9.24	6.09	9.03

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2003 - 2018, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	26.4	83.8	196	694	947	1,661	1,023	419	134	20.0	6.4	9.1
Max	59.6	229	470	1,913	2,152	4,544	2,235	1,280	376	46.0	17.6	25.3
(WY)	(2017)	(2007)	(2007)	(2011)	(2017)	(2017)	(2011)	(2011)	(2011)	(2011)	(2004)	(2004)
Min	9.0	36.5	66.9	114	169	241	320	76.2	33.3	2.2	0.1	2.3
(WY)	(2016)	(2004)	(2012)	(2008)	(2005)	(2010)	(2015)	(2015)	(2007)	(2015)	(2015)	(2007)



APPENDIX J

Community Engagement Information

KELLER ASSOCIATES

Insert Sign-In Sheet and Public Comments following Public Meeting on August 20, 2020

APPENDIX K

Wastewater Reuse Rules

KELLER ASSOCIATES

Excerpt taken from IDAPA 58.01.17 – Summary of Class Requirements for Wastewater Reuse

TABLE 3 - RECYCLED WATER USES					
Recycled Water Uses	**Class A**	**Class B**	**Class C**	**Class D**	**Class E**
Uses relating to Irrigation and buffers					
Buffers required	No	Yes	Yes	Yes	Yes
Fodder, fiber crops	Yes	Yes	Yes	Yes	Yes
Commercial timber, firewood	Yes	Yes	Yes	Yes	Yes
Processed food crops or "food crops that must undergo commercial pathogen-destroying processing before being consumed by humans"	Yes	Yes	Yes	Yes	No
Ornamental nursery stock, or Christmas trees	Yes	Yes	Yes	Yes	No
Sod and seed crops not intended for human ingestion	Yes	Yes	Yes	Yes	No
Pasture for animals not producing milk for human consumption	Yes	Yes	Yes	Yes	No
Pasture for animals producing milk for human consumption	Yes	Yes	Yes	No	No
Orchards and vineyards irrigation during the fruiting season, if no fruit harvested for raw use comes in contact with the irrigation water or ground, or will only contact the unedible portion of raw food crops	Yes	Yes	Yes	No	No
Highway medians and roadside vegetation irrigation on sides	Yes	Yes	Yes	No	No
Cemetery irrigation	Yes	Yes	Yes	No	No
Parks, playgrounds, and school yards during periods of non-use	Yes	Yes	No	No	No
Parks, playgrounds, and school yards during periods of use	Yes	No	No	No	No
Golf courses	Yes	Yes	No	No	No
Food crops, including all edible food crops	Yes	Yes	No	No	No
Residential landscape	Yes	No	No	No	No
Uses at Industrial, Commercial, or Construction Sites					
Dust suppression at construction sites and control on roads and streets	Yes	Yes	Yes	No	No
Toilet flushing at industrial and commercial sites, when only trained maintenance personnel have access to plumbing for repairs	Yes	Yes	Yes	No	No
Nonstructural fire fighting	Yes	Yes	Yes	No	No
Cleaning roads, sidewalks and outdoor work areas	Yes	Yes	Yes	No	No
Backfill consolidation around non-potable piping	Yes	Yes	Yes	No	No
Soil compaction	Yes	Yes	Yes	No	No
Commercial campus irrigation	Yes	Yes	No	No	No
Fire suppression	Yes	Yes	No	No	No
Snowmaking for winter parks, resorts	Yes	No	No	No	No
Commercial laundries	Yes	No	No	No	No

TABLE 3 - RECYCLED WATER USES					
Recycled Water Uses	**Class A**	**Class B**	**Class C**	**Class D**	**Class E**
Ground Water Recharge					
Ground water recharge through surface spreading, seepage ponds or other unlined surface water features, such as landscape impoundments	Yes	No	No	No	No
Subsurface Distribution					
Subsurface distribution.	Yes	Yes	Yes	Yes	No

APPENDIX L

CIPs and Cost Estimates

KELLER ASSOCIATES

Capital Improvement Plan
Cost Summary

ID#	Item	Estimated Cost (2020)
Priority 1 Improvements		
1.8	Collection System Analysis and I&I Study	$ 60,000
	Collection System Priority 1 Improvements	$ 60,000
Priority 2 Improvements		
2.1	Southwest Expansion of Collection System (Project 4a)	$ 1,159,000
	Collection System Priority 2 Improvements	$ 1,159,000
Priority 3 Improvements		
3.3	Southeast Expansion of Collection System (Project 4b)	$ 311,000
3.4	Northwest Expansion of Collection System (Project 3)	$ 331,000
3.5	Northeast Expansion of Collection System (Project 2)	$ 949,000
3.6	Upgrade Existing 10" Main (Project 1)	$ 1,344,000
	Collection System Priority 3 Improvements	$ 2,935,000

The opinion of most probable cost 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.

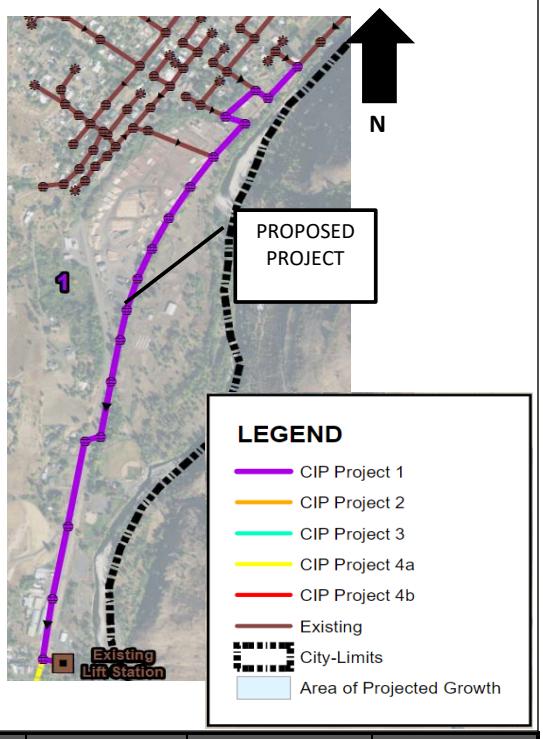
Juliaetta Collection System
Upgrade Existing 10" Main (to 12")

Project Identifier: 1 (ID #3.6)

Objectives: Replace undersized line running roughly from 4th Street to the lift station south of the City.

Potential Issues:
- Maintaining services during construction
- Potential Bypass Pumping
- Manhole Replacement
- Potential AC Lines (removal costs)
- Asphalt path conflicts

Project Location:
4th Street Silo to Lift Station



Items	Unit	Unit Price	Estimated Quantity	Estimated Cost (2020)
Existing Pipe Removal (10")	LF	$ 25	6500	$ 162,500
12" Sewer Pipe (PVC)	LF	$ 60	6500	$ 390,000
Manhole Removal	EA	$ 750	18	$ 13,500
Manholes - 48"	EA	$ 6,000	18	$ 108,000
Asphalt Path Pavement Repair	SY	$ 30	1800	$ 54,000
Traffic Control	LS	$ 10,000	1	$ 10,000
Subtotal				$ 738,000
Mobilization - Percent of Item Cost Sum	%	10%		$ 73,800
Contingency - % of construction costs	%	35%		$ 258,300
Total Construction Costs				$ 1,070,100
Geotechnical Investigation	LS	$ 6,000		$ 6,000
Engineering and CMS - % of construction costs	%	25%		$ 267,525
Total Estimated Cost (rounded)			$1,344,000	

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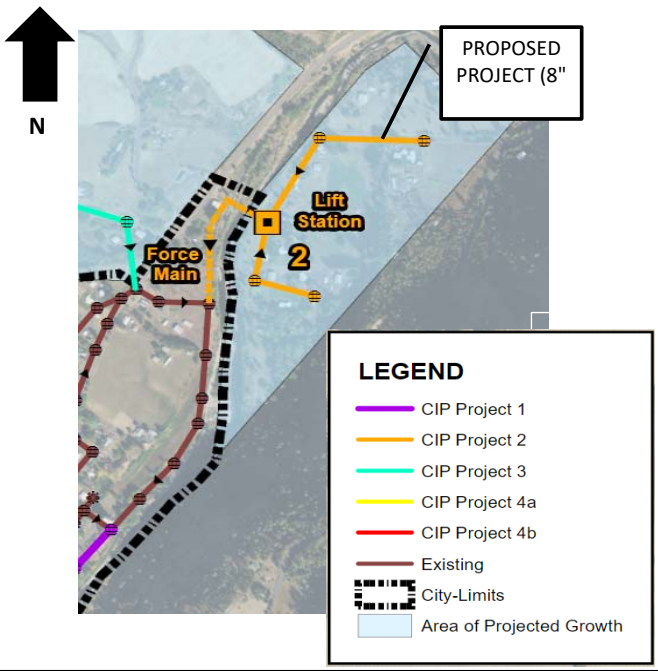
Juliaetta Collection System
Northeast Expansion (east side of river)

Project Identifier: 2 (ID #3.5)

Objectives: Connect northeast neighborhood (North Juliaetta Grade) to existing sewer system.

Potential Issues:
- Maintaining services during construction
- Potential Bypass Pumping
- Pipe Boring across river
- Potential New Lift Station

Project Location:
Northeastern Juliaetta (North Juliaetta Grade)



Items	Unit	Unit Price	Estimated Quantity	Estimated Cost (2020)
8" Sewer Pipe (PVC)	LF	$ 50	870	$ 43,500
Manholes - 48"	EA	$ 6,000	3	$ 18,000
Pipe Boring Under River (8")	LF	$ 800	360	$ 288,000
Asphalt Path Pavement Repair	SY	$ 30	300	$ 9,000
Traffic Control	LS	$ 1,500	1	$ 1,500
Lift Station & Wet Well	LS	$ 160,000	1	$ 160,000
Subtotal				$ 520,000
Mobilization - Percent of Item Cost Sum	%	10%		$ 52,000
Contingency - % of construction costs	%	35%		$ 182,000
Total Construction Costs				$ 754,000
Geotechnical Investigation	LS	$ 6,000		$ 6,000
Engineering and CMS - % of construction costs	%	25%		$ 188,500
Total Estimated Cost (rounded)	$949,000			

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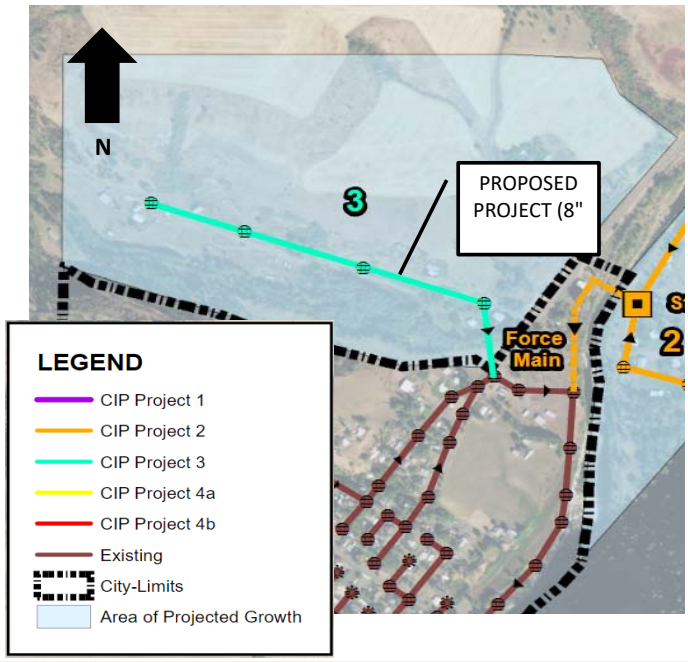
Juliaetta Collection System
Northwest Expansion

Project Identifier: 3 (ID #3.4)

Objectives: Connect north neighborhood (Middle Potlatch Creek Road) to existing sewer system.

Potential Issues:
- Maintaining services during construction
- Potential Bypass Pumping for services

Project Location:
North Juliaetta Connection (Middle Potlatch Creek Road)



Items	Unit	Unit Price	Estimated Quantity	Estimated Cost (2020)
8" Sewer Pipe (PVC)	LF	$ 50	2700	$ 135,000
Manholes - 48"	EA	$ 6,000	5	$ 30,000
Asphalt Repair	SY	$ 30	300	$ 9,000
Traffic Control	LS	$ 5,000	1	$ 5,000
Subtotal				$ 179,000
Mobilization - Percent of Item Cost Sum	%	10%		$ 17,900
Contingency - % of construction costs	%	35%		$ 62,650
Total Construction Costs				$ 259,550
Geotechnical Investigation	LS	$ 6,000		$ 6,000
Engineering and CMS - % of construction costs	%	25%		$ 64,888
Total Estimated Cost (rounded)	$331,000			

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

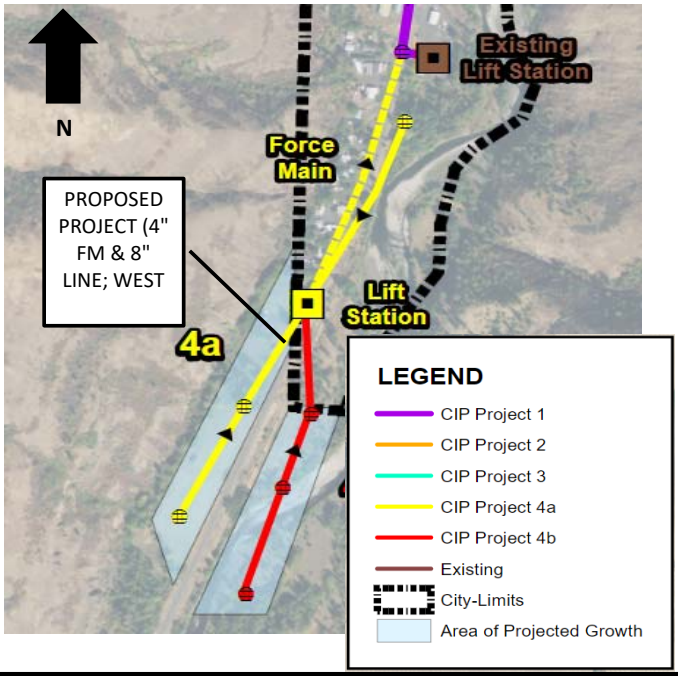
Juliaetta Collection System
Southwest Expansion (south of WWTP)

Project Identifier: 4a (ID #2.1)

Objectives: Connect southwest industrial area to existing sewer system.

Potential Issues:
- Maintaining services during construction
- Potential Bypass Pumping

Project Location:
South Juliaetta Connection (Industrial Area)



Items	Unit	Unit Price	Estimated Quantity	Estimated Cost (2020)
4" Forcemain	LF	$ 50	1600	$ 80,000
8" Sewer Pipe (PVC)	LF	$ 50	5800	$ 290,000
Pipe Boring Under Highway (8")	LF	$ 800	70	$ 56,000
Manholes - 48"	EA	$ 6,000	6	$ 36,000
Asphalt Repair	SY	$ 30	300	$ 9,000
Traffic Control	LS	$ 5,000	1	$ 5,000
Lift Station & Wet Well	LS	$ 160,000	1	$ 160,000
Subtotal				$ 636,000
Mobilization - Percent of Item Cost Sum	%	10%		$ 63,600
Contingency - % of construction costs	%	35%		$ 222,600
Total Construction Costs				$ 922,200
Geotechnical Investigation	LS	$ 6,000		$ 6,000
Engineering and CMS - % of construction costs	%	25%		$ 230,550
Total Estimated Cost (rounded)	$1,159,000			

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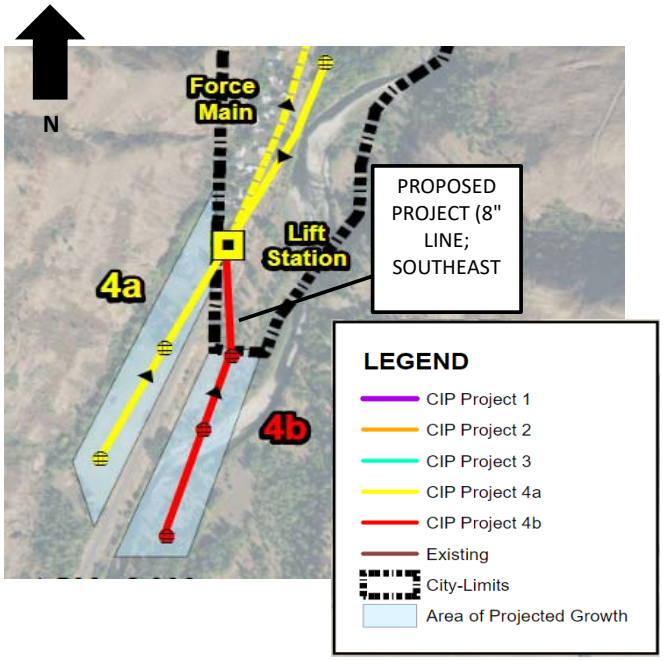
Juliaetta Collection System
Southeast Expansion (south of WWTP)

Project Identifier: 4b (ID #3.3)

Objectives: Connect southeast industrial area to existing sewer system.

Potential Issues:
- Maintaining services during construction
- Potential Bypass Pumping

Project Location:
South Juliaetta Connection (Industrial Area)



Items	Unit	Unit Price	Estimated Quantity	Estimated Cost (2020)
8" Sewer Pipe (PVC)	LF	$ 50	1600	$ 80,000
Pipe Boring Under Highway (8")	LF	$ 800	70	$ 56,000
Manholes - 48"	EA	$ 6,000	3	$ 18,000
Asphalt Repair	SY	$ 30	300	$ 9,000
Traffic Control	LS	$ 5,000	1	$ 5,000
Subtotal				$ 168,000
Mobilization - Percent of Item Cost Sum	%	10%		$ 16,800
Contingency - % of construction costs	%	35%		$ 58,800
Total Construction Costs				$ 243,600
Geotechnical Investigation	LS	$ 6,000		$ 6,000
Engineering and CMS - % of construction costs	%	25%		$ 60,900
Total Estimated Cost (rounded)	$311,000			

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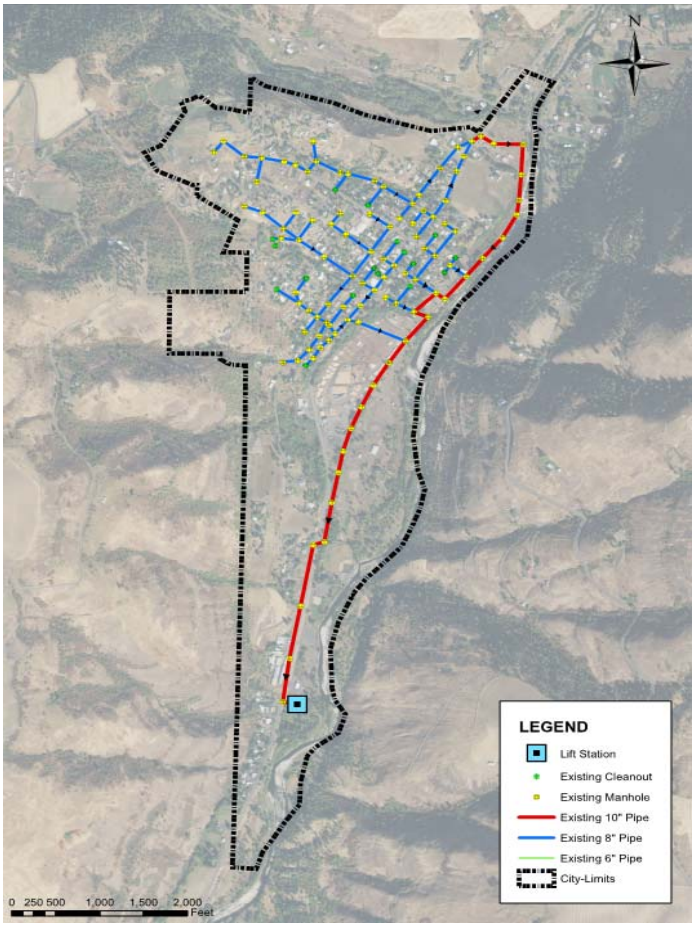
Juliaetta Collection System
Collection System Analsyis and I&I Study

Project Identifier: 5 (ID #1.8)

Objectives: Evaluate I&I issues and evaluate pipeline conditions to develop recommended repairs and solutions. This analysis should include influent and collection system flow monitoring, collection system TV inspection and smoke testing, collection system conditions assessments, and evaluation of recommended repairs. This evaluation should include hydraulic modeling of the system.

Project Location:
City-Wide



Items	Unit	Unit Price	Estimated Quantity	Estimated Cost (2020)
Engineering	LS	$ 60,000	1	$ 60,000
Total				$ 60,000
Total Estimated Cost (rounded)	$60,000			

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Project 1 O&M	Quantity	Unit	Unit Price	Amount	Comments
12" PVC Pipe Replacement	1300	LF	$ 60	$ 78,000	Assuming 10% replacement in 20 years
Worker Costs	2,080	HR	$ 25	$ 52,000	1 hour troubleshooting/maintenance/observation per week for system for 20 years
			Subtotal	$ 130,000	
			40- Year Annual O&M	$ 4,000	

Project 2 O&M	Quantity	Unit	Unit Price	Amount	Comments
8" PVC Pipe Replacement	174	LF	$ 50	$ 8,700	Assuming 10% replacement in 20 years
Pump Power	40	$/YR	$ 231	$ 9,238	Assuming pump operating constantly during the planning period at the flow shown
Parts	4	EA	$ 10,000	$ 40,000	Replace 2 pumps once per 20 years $10k each
Worker Costs	2,080	HR	$ 25	$ 52,000	1 hour troubleshooting/maintenance/observation per week for system
			Subtotal	$ 110,000	
			40- Year Annual O&M	$ 3,000	

Project 3 O&M	Quantity	Unit	Unit Price	Amount	Comments
8" PVC Pipe Replacement	540	LF	$ 50	$ 27,000	Assuming 10% replacement in 20 years
Worker Costs	4,160	HR	$ 25	$ 104,000	1 hour troubleshooting/maintenance/observation per week for system
			Subtotal	$ 131,000	
			40- Year Annual O&M	$ 4,000	

Project 4a O&M	Quantity	Unit	Unit Price	Amount	Comments
8" PVC Pipe Replacement	1160	LF	$ 50	$ 58,000	Assuming 10% replacement in 20 years
4" Forcemain	320	LF	$ 50	$ 16,000	Assuming 10% replacement in 20 years
Pump Power	40	$/YR	$ 231	$ 9,238	Assuming pump operating constantly during the planning period at the flow shown
Parts	4	EA	$ 10,000	$ 40,000	Replace 2 pumps once per 20 years $10k each
Worker Costs	4,160	HR	$ 25	$ 104,000	1 hour troubleshooting/maintenance/observation per week for system
			Subtotal	$ 228,000	
			40- Year Annual O&M	$ 6,000	

Project 4b O&M	Quantity	Unit	Unit Price	Amount	Comments
8" PVC Pipe Replacement	320	LF	$ 50	$ 16,000	Assuming 10% replacement in 20 years
Worker Costs	2,080	HR	$ 25	$ 52,000	1 hour troubleshooting/maintenance/observation per week for system
			Subtotal	$ 68,000	
			40- Year Annual O&M	$ 2,000	

Item	Project 1	Project 2	Project 3	Project 4a	Project 4b
Existing Pipe Removal (10")	$ 162,500	$ -	$ -	$ -	$ -
4" Forcemain	$ -	$ -	$ -	$ 80,000	$ -
8" Sewer Pipe (PVC)	$ -	$ 43,500	$ 135,000	$ 290,000	$ 80,000
12" Sewer Pipe (PVC)	$ 390,000	$ -	$ -	$ -	$ -
Manhole Removal	$ 13,500	$ -	$ -	$ -	$ -
Manholes - 48"	$ 108,000	$ 18,000	$ 30,000	$ 36,000	$ 18,000
Pipe Boring Under River (8")	$ -	$ 288,000	$ -	$ 56,000	$ 56,000
Asphalt Path Pavement Repair	$ 54,000	$ 9,000	$ 9,000	$ 9,000	$ 9,000
Traffic Control	$ 10,000	$ 1,500	$ 5,000	$ 5,000	$ 5,000
Lift Station & Wet Well	$ -	$ 160,000	$ -	$ 160,000	
Subtotal	$ 738,000	$ 520,000	$ 179,000	$ 636,000	$ 168,000
Mobilization (10%)	$ 73,800	$ 52,000	$ 17,900	$ 63,600	$ 16,800
Subtotal	$ 811,800	$ 572,000	$ 196,900	$ 699,600	$ 184,800
Contingencies (35%)	$ 258,300	$ 182,000	$ 62,650	$ 222,600	$ 58,800
Subtotal	$ 1,070,100	$ 754,000	$ 259,550	$ 922,200	$ 243,600
Geotechnical Investigation	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000
Soft Costs (Engineering & CMS; 25%)	$ 267,525	$ 188,500	$ 64,888	$ 230,550	$ 60,900
Total Project Cost	$ 1,344,000	$ 949,000	$ 331,000	$ 1,159,000	$ 311,000
Estimated Annual O&M	$ 4,000	$ 3,000	$ 4,000	$ 6,000	$ 2,000
40-Year Life Cycle Cost	$ 1,464,000	$ 1,039,000	$ 451,000	$ 1,339,000	$ 371,000

Capital Improvement Plan
Cost Summary

ID#	Item	Estimated Cost (2020)
Priority 1 Improvements		
1.1	New Lift Station with Screw Centrifugal Pumps	$ 328,000
1.2	Preliminary Treatment Improvements	$ 767,000
1.3	Secondary Treatment Improvements	$ 2,810,000
1.4	Sludge Treatment & Disposal	$ 1,438,000
1.5	Continuous Flow & Temperature Monitoring of Influent & Effluent	$ 157,000
1.6	New Generator	$ 88,400
1.7	Add Slide Gates to Chlorine Chamber	$ 8,000
	WWTP Priority 1 Improvements	$ 5,596,400
Priority 2 Improvements		
	None	
	WWTP Priority 2 Improvements	$ -
Priority 3 Improvements		
3.1	Composite Samplers	$ 37,000
3.2	Temperature Treatment	$ 448,000
	WWTP Priority 3 Improvements	$ 485,000

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Monitoring Equipment

Item	Unit	Quantity	Unit Price	Estimated Cost (2020)
Monitoring Equipment				
Influent Magnetic Flow Meter & Vault	EA	1	$ 21,000	$ 21,000
Influent Temperature probe with storage	EA	1	$ 7,000	$ 7,000
Effluent Parshall Flume Flow measurement	EA	1	$ 25,000	$ 25,000
Effluent Temperature Probe & Weather Station with storag	EA	1	$ 13,000	$ 13,000
Electrical/Controls	LS	1	$ 10,000	$ 10,000
Subtotal				$ 76,000
General Conditions		10%		$ 8,000
Subtotal				$ 84,000
Contingencies		30%		$ 25,000
Subtotal				$ 109,000
Contractor OH&P		15%		$ 16,000
Subtotal				$ 125,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 32,000
Total Estimated Cost				$ 157,000

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Sampling Equipment

Item	Unit	Quantity	Unit Price	Estimated Cost (2020)
Sampling Equipment				
Composite Sampler	EA	2	$ 7,000	$ 14,000
Electrical/Controls	LS	1	$ 3,000	$ 3,000
Subtotal				$ 17,000
General Conditions		10%		$ 2,000
Subtotal				$ 19,000
Contingencies		30%		$ 6,000
Subtotal				$ 25,000
Contractor OH&P		15%		$ 4,000
Subtotal				$ 29,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 8,000
Total Estimated Cost				$ 37,000

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Generator Replacement

Item	Unit	Quantity	Unit Price	Estimated Cost (2020)
Generator Replacement				
New Generator	LS	1	$ 28,350	$ 28,350
Demolition of Existing Generator	LS	1	$ 12,000	$ 12,000
New Transfer Switch	LS	1	$ 3,000	$ 3,000
Subtotal				$ 43,000
General Conditions		10%		$ 4,300
Subtotal				$ 47,300
Contingencies		30%		$ 14,200
Subtotal				$ 61,500
Contractor OH&P		15%		$ 9,200
Subtotal				$ 70,700
Soft Costs (Admin, Engineering & CMS)		25%		$ 17,700
Total Estimated Cost				$ 88,400

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New Suction Pump Lift Station

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Suction Pump Lift Station				
Site Work	LS	1	$ 30,000	$ 30,000
New Package Lift Station	EA	1	$ 119,000	$ 119,000
Precast Manhole	EA	1	$ 31,000	$ 31,000
Electrical/Controls	LS	1	$ 24,000	$ 24,000
Subtotal				$ 204,000
General Conditions		10%		$ 20,000
Subtotal				$ 224,000
Contingencies		30%		$ 67,000
Subtotal				$ 291,000
Contractor OH&P		15%		$ 44,000
Subtotal				$ 335,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 84,000
Total Estimated Cost				$ 419,000

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New Submersible Pump Lift Station

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Submersible Pump Lift Station				
Site Work	LS	1	$ 30,000	$ 30,000
Precast Manhole	EA	1	$ 31,000	$ 31,000
Pump & Appurtenances	LS	1	$ 73,803	$ 73,803
Electrical/Controls	LS	1	$ 24,000	$ 24,000
Subtotal				$ 159,000
General Conditions		10%		$ 16,000
Subtotal				$ 175,000
Contingencies		30%		$ 53,000
Subtotal				$ 228,000
Contractor OH&P		15%		$ 34,000
Subtotal				$ 262,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 66,000
Total Estimated Cost				$ 328,000

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Upgrade Suction Pump Lift Station

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Suction Pump Lift Station				
Temporary bypass pumping	LS	1	$ 15,000	$ 15,000
New Lift Station Coating	LS	1	$ 35,000	$ 35,000
New Package Pump system	EA	1	$ 119,000	$ 119,000
Electrical/Controls	LS	1	$ 24,000	$ 24,000
Subtotal				$ 193,000
General Conditions		10%		$ 19,000
Subtotal				$ 212,000
Contingencies		30%		$ 64,000
Subtotal				$ 276,000
Contractor OH&P		15%		$ 41,000
Subtotal				$ 317,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 80,000
Total Estimated Cost				$ 397,000

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Grit Removal & Coarse Screen

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Preliminary Treatment				
Coarse Screen & Grit Removal	EA	1	$ 323,000	$ 323,000
Heat Trace	LS	1	$ 1,000	$ 1,000
Electrical/Controls	LS	1	$ 49,000	$ 49,000
Subtotal				$ 373,000
General Conditions		10%		$ 37,000
Subtotal				$ 410,000
Contingencies		30%		$ 123,000
Subtotal				$ 533,000
Contractor OH&P		15%		$ 80,000
Subtotal				$ 613,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 154,000
Total Estimated Cost				$ 767,000

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Grit Removal, Coarse, & Fine Screen

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Preliminary Treatment				
Coarse Screen, Grit Removal, and Fine Screen	EA	1	$ 541,000	$ 541,000
Heat Trace	LS	1	$ 1,000	$ 1,000
Electrical/Controls	LS	1	$ 82,000	$ 82,000
Subtotal				$ 624,000
General Conditions		10%		$ 62,000
Subtotal				$ 686,000
Contingencies		30%		$ 206,000
Subtotal				$ 892,000
Contractor OH&P		15%		$ 134,000
Subtotal				$ 1,026,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 257,000
Total Estimated Cost				$ 1,283,000

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Extended Aeration System

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Secondary Treatment				
Sitework	LS	1	$ 100,000	$ 100,000
Extended Aeration System w/ Clarifiers (2 train)	LS	1	$ 1,014,000	$ 1,014,000
Electrical/Controls	LS	1	$ 153,000	$ 153,000
SCADA	LS	1	$ 100,000	$ 100,000
Subtotal				$ 1,367,000
General Conditions		10%		$ 137,000
Subtotal				$ 1,504,000
Contingencies		30%		$ 451,000
Subtotal				$ 1,955,000
Contractor OH&P		15%		$ 293,000
Subtotal				$ 2,248,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 562,000
Total Estimated Cost				$ 2,810,000

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Oxidation Ditch & Clarifiers

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Oxidation Ditch & Clarifiers				
Sitework	LS	1	$ 300,000	$ 300,000
Demo Existing Tanks	LS	1	$ 50,000	$ 50,000
Concrete	CY	940	$ 950	$ 893,000
Rotors & Accessory Equipment	EA	4	$ 48,000	$ 192,000
RAS & Scum Pumps	LS	1	$ 54,000	$ 54,000
Clarifier	EA	2	$ 193,000	$ 386,000
Electrical/Controls	LS	1	$ 229,000	$ 229,000
SCADA	LS	1	$ 100,000	$ 100,000
Subtotal				$ 2,204,000
General Conditions		10%		$ 220,000
Subtotal				$ 2,424,000
Contingencies		30%		$ 727,000
Subtotal				$ 3,151,000
Contractor OH&P		15%		$ 473,000
Subtotal				$ 3,624,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 906,000
Total Estimated Cost				$ 4,530,000

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MBR System

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
MBR System				
Sitework	LS	1	$ 100,000	$ 100,000
MBR	LS	1	$ 1,756,000	$ 1,756,000
Electrical/Controls	LS	1	$ 264,000	$ 264,000
SCADA	LS	1	$ 130,000	$ 130,000
Subtotal				$ 2,250,000
General Conditions		10%		$ 225,000
Subtotal				$ 2,475,000
Contingencies		30%		$ 743,000
Subtotal				$ 3,218,000
Contractor OH&P		15%		$ 483,000
Subtotal				$ 3,701,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 926,000
Total Estimated Cost				$ 4,627,000

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SBR System

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
SBR System				
Sitework	LS	1	$ 100,000	$ 100,000
SBR	LS	1	$ 1,104,000	$ 1,104,000
Electrical/Controls	LS	1	$ 166,000	$ 166,000
SCADA	LS	1	$ 100,000	$ 100,000
Subtotal				$ 1,470,000
General Conditions		10%		$ 147,000
Subtotal				$ 1,617,000
Contingencies		30%		$ 485,000
Subtotal				$ 2,102,000
Contractor OH&P		15%		$ 315,000
Subtotal				$ 2,417,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 605,000
Total Estimated Cost				$ 3,022,000

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Temperature Reduction

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Temperature Reduction				
Cooling Tower/Chiller	EA	1	$ 192,600	$ 192,600
Electrical/Controls	LS	1	$ 28,900	$ 28,900
Subtotal				$ 222,000
General Conditions		10%		$ 22,000
Subtotal				$ 244,000
Contingencies		30%		$ 67,000
Subtotal				$ 311,000
Contractor OH&P		15%		$ 47,000
Subtotal				$ 358,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 90,000
Total Estimated Cost				$ 448,000

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Improved Disinfection Control

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Chemical Dosing Systems				
Sitework	LS	1	$ 40,000	$ 40,000
Chemical Dosing Systems	LS	1	$ 81,000	$ 81,000
Chlorine Analyzer	EA	1	$ 10,000	$ 10,000
Mixer	EA	1	$ 5,000	$ 5,000
Chlorine Contact Basin	LS	1	$ 50,000	$ 50,000
Electrical/Controls	LS	1	$ 42,000	$ 42,000
Subtotal				$ 228,000
General Conditions		10%		$ 23,000
Subtotal				$ 251,000
Contingencies		30%		$ 75,000
Subtotal				$ 326,000
Contractor OH&P		15%		$ 49,000
Subtotal				$ 375,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 94,000
Total Estimated Cost				$ 469,000

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UV System

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
UV System				
Sitework	LS	1	$ 30,000	$ 30,000
UV Equipment	EA	2	$ 48,000	$ 96,000
UV Channels	LS	1	$ 80,000	$ 80,000
Electrical/Controls	LS	1	$ 42,000	$ 42,000
Subtotal				$ 248,000
General Conditions		10%		$ 25,000
Subtotal				$ 273,000
Contingencies		30%		$ 82,000
Subtotal				$ 355,000
Contractor OH&P		15%		$ 53,000
Subtotal				$ 408,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 102,000
Total Estimated Cost				$ 510,000

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Chlorine Contact Chamber Gates

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Contact Chamber Gates				
Slide Gates (Installed)	EA	4	$ 2,000	$ 8,000
Subtotal				$ 8,000
General Conditions		0%		$ -
Subtotal				$ 8,000
Contingencies		0%		$ -
Subtotal				$ 8,000
Contractor OH&P		0%		$ -
Subtotal				$ 8,000
Soft Costs (Admin, Engineering & CMS)		0%		$ -
Total Estimated Cost				$ 8,000

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Improved Drying Beds

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Improved Drying Beds				
Sitework	LS	1	$ 22,000	$ 22,000
Backfill/bedding	CY	200	$ 36	$ 7,200
6" Slab on Grade	CY	275	$ 850	$ 233,800
Retrofit Existing Structure	SF	2268	$ 40	$ 90,800
Coiling Door	EA	4	$ 3,000	$ 12,000
HVAC	LS	1	$ 50,000	$ 50,000
Electrical	LS	1	$ 19,000	$ 19,000
Piping and Valves	LS	1	$ 50,000	$ 50,000
Subtotal				$ 485,000
General Conditions		10%		$ 49,000
Subtotal				$ 534,000
Contingencies		30%		$ 160,000
Subtotal				$ 694,000
Contractor OH&P		15%		$ 104,000
Subtotal				$ 798,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 200,000
Total Estimated Cost				$ 998,000

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Belt Press

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Belt Press				
Sitework	LS	1	$ 40,000	$ 40,000
Structural	LS	1	$ 100,000	$ 100,000
Belt Press	EA	1	$ 352,000	$ 352,000
Electrical/Controls	LS	1	$ 100,000	$ 100,000
Subtotal				$ 592,000
General Conditions		10%		$ 59,000
Subtotal				$ 651,000
Contingencies		30%		$ 195,000
Subtotal				$ 846,000
Contractor OH&P		15%		$ 127,000
Subtotal				$ 973,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 244,000
Total Estimated Cost				$ 1,217,000

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Screw Press

Item	Unit	Quantity	Unit Price	Estimated Cost (2019)
Screw Press				
Sitework	LS	1	$ 40,000	$ 40,000
Structural	LS	1	$ 100,000	$ 100,000
Screw Press	EA	1	$ 459,000	$ 459,000
Electrical/Controls	LS	1	$ 112,000	$ 100,000
Subtotal				$ 699,000
General Conditions		10%		$ 70,000
Subtotal				$ 769,000
Contingencies		30%		$ 231,000
Subtotal				$ 1,000,000
Contractor OH&P		15%		$ 150,000
Subtotal				$ 1,150,000
Soft Costs (Admin, Engineering & CMS)		25%		$ 288,000
Total Estimated Cost				$ 1,438,000

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City of Juliaetta - Lift Station Operation and Maintenance Costs

Item	Alternative 2 - New Suction Lift Pump Station	Alternative 3 - New Submersible Lift Station	Alternative 4 - New Suction Lift Pumps & Lift Station Coating
Site Work	$ 30,000	$ 30,000	$ -
New Package Lift Station	$ 119,000	$ 73,803	$ 119,000
Bypass pumping	$ -		$ 15,000
New Lift Station Coating	$ -		$ 35,000
Precast Manhole	$ 31,000	$ 31,000	
Electrical/Controls	$ 24,000	$ 24,000	$ 24,000
Subtotal	$ 204,000	$ 159,000	$ 193,000
General Conditions (10%)	$ 20,000	$ 16,000	$ 19,000
Subtotal	$ 224,000	$ 175,000	$ 212,000
Contingencies (30%)	$ 67,000	$ 53,000	$ 64,000
Subtotal	$ 291,000	$ 228,000	$ 276,000
Contractor OH&P (15%)	$ 44,000	$ 34,000	$ 41,000
Subtotal	$ 335,000	$ 262,000	$ 317,000
Soft Costs (Admin, Engineering & CMS; 25%)	$ 84,000	$ 66,000	$ 80,000
Total Project Cost	$ 419,000	$ 328,000	$ 397,000
Estimated Annual O&M	$ 2,000	$ 2,000	$ 2,000
20-Year Life Cycle Cost	$ 454,000	$ 363,000	$ 432,000

Item	Alternative 2 - Improved Extended Aeration	Alternative 3 - Oxidation Ditch	Alternative 4 - MBR	Alternative 5 - SBR
Sitework	$ 100,000	$ 300,000	$ 100,000	$ 100,000
Headworks System	$ 323,000	$ 323,000	$ 541,000	$ 323,000
Secondary System	$ 1,014,000	$ 1,575,000	$ 1,756,000	$ 1,104,000
Electrical/Controls	$ 202,000	$ 602,000	$ 346,000	$ 215,000
SCADA	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Subtotal	$ 1,739,000	$ 2,900,000	$ 2,843,000	$ 1,842,000
General Conditions (10%)	$ 174,000	$ 290,000	$ 284,000	$ 184,000
Subtotal	$ 1,913,000	$ 3,190,000	$ 3,127,000	$ 2,026,000
Contingencies (30%)	$ 574,000	$ 957,000	$ 938,000	$ 608,000
Subtotal	$ 2,487,000	$ 4,147,000	$ 4,065,000	$ 2,634,000
Contractor OH&P (15%)	$ 373,000	$ 622,000	$ 610,000	$ 395,000
Subtotal	$ 2,860,000	$ 4,769,000	$ 4,675,000	$ 3,029,000
Soft Costs (Admin, Engineering & CMS; 25%)	$ 715,000	$ 1,193,000	$ 1,169,000	$ 758,000
Total Project Cost	$ 3,575,000	$ 5,962,000	$ 5,844,000	$ 3,787,000
Estimated Annual O&M	$ 53,000	$ 59,000	$ 81,000	$ 56,000
20-Year Life Cycle Cost	$ 4,485,000	$ 6,975,000	$ 7,235,000	$ 4,749,000

Item	Alternative 2 - Improved Chlorine Disinfection	Alternative 3 - UV Disinfection
Sitework	$ 40,000	$ 30,000
Chemical Dosing Systems	$ 81,000	$ -
Chlorine Analyzer	$ 10,000	$ -
Mixer	$ 5,000	$ -
Chlorine Contact Basin	$ 50,000	$ -
UV Equipment	$ -	$ 96,000
UV Channels	$ -	$ 80,000
Slide Gates	$ -	$ -
Coating	$ -	$ -
Electrical/Controls	$ 42,000	$ 42,000
Subtotal	$ 228,000	$ 248,000
General Conditions (10%)	$ 23,000	$ 25,000
Subtotal	$ 251,000	$ 273,000
Contingencies (30%)	$ 75,000	$ 82,000
Subtotal	$ 326,000	$ 355,000
Contractor OH&P (15%)	$ 49,000	$ 53,000
Subtotal	$ 375,000	$ 408,000
Soft Costs (Admin, Engineering & CMS; 25%)	$ 94,000	$ 102,000
Total Project Cost	$ 469,000	$ 510,000
Estimated Annual O&M	$ 5,000	$ 7,000
20-Year Life Cycle Cost	$ 555,000	$ 631,000

Item	Alternative 2 - Drying Beds	Alternative 3 - Belt Press	Alternative 4 - Screw Press
Sitework	$ 263,000	$ 40,000	$ 40,000
Structural	$ 153,000	$ 100,000	$ 100,000
Dewatering System Equipment	$ 50,000	$ 352,000	$ 459,000
Electrical/Controls	$ 19,000	$ 100,000	$ 100,000
Subtotal	$ 485,000	$ 592,000	$ 699,000
General Conditions (10%)	$ 49,000	$ 59,000	$ 70,000
Subtotal	$ 534,000	$ 651,000	$ 769,000
Contingencies (30%)	$ 160,000	$ 195,000	$ 231,000
Subtotal	$ 694,000	$ 846,000	$ 1,000,000
Contractor OH&P (15%)	$ 104,000	$ 127,000	$ 150,000
Subtotal	$ 798,000	$ 973,000	$ 1,150,000
Soft Costs (Admin, Engineering & CMS; 25%)	$ 200,000	$ 244,000	$ 288,000
Total Project Cost	$ 998,000	$ 1,217,000	$ 1,438,000
Estimated Annual O&M	$ 37,000	$ 36,000	$ 22,000
20-Year Life Cycle Cost	$ 1,634,000	$ 1,836,000	$ 1,816,000

APPENDIX M

Facility and System Classification Worksheets

KELLER ASSOCIATES

IDAHO PUBLIC WASTEWATER COLLECTION SYSTEM CLASSIFICATION WORKSHEET

OFFICE USE ONLY
DON'T WRITE HERE

System Class _____

Approved by: _____

Date: _____

Name of System: City of Juliaetta Collection System

Legal Owner of Collection System: City of Juliaetta

System Address: 1666 Highway 3

City: Juliaetta **State:** ID **Zip Code:** 83535

Contact Person: _____ **Title:** _____

Business Phone Number: (___)_____ **Email:** _____

Collection System Classification Worksheet is (check one):

☐ **Initial System Rating** ☐ **System Upgrade** ☐ **Standard 5 yr Rating**

Date of last system classification rating (if applicable) _____

Collection System - Design Flow/Actual Flow _____/_____

Item	Points	Your System
System Size (Minimum 3 points)		
Miles of Line 5.27	1 point/10 miles or part	1
Number of Connections = 310 (Use Connection Equivalencies)	1 point /250 or part	1
Number of Manholes 84	1 point/150 or part	1
Lift Stations 2	1 point/each	2
Miles of Force Mains 0	1 point/mile or part	0
Odor Abatement		
Chemical Feed System	2 points	0
Air Entrainment System	2 points	0
Bio-filter System	2 points	0
Maintenance Management System		
Manual Maintenance Management System	3 points	3
Manual Mapping System	3 points	3
Computerized Maintenance Management System	5 points	0
Computerized Mapping System	5 points	0
Alarm or SCADA System for Lift Stations	5 points	0
TOTAL POINTS FOR YOUR SYSTEM		11

System Classification Key	Your Classification
System size subtotal of 6 points or less, 500 or fewer connections, and associated treatment system also meets the definition of a very small wastewater system (VSWWS).	☐ VSWWS
0-30 points	■ Class I
31-55 points	☐ Class II
56-75 points	☐ Class III
76 or greater	☐ Class IV

_____/_____

Signature of Legal Owner or Owner's Representative Date

Mail form to: Department of Environmental Quality, 1410 N. Hilton, Boise, Idaho 83706, Attn: Adam Bussan

IDAHO PUBLIC WASTEWATER TREATMENT PLANT CLASSIFICATION WORKSHEET

OFFICE USE DO NOT WRITE HERE

System Class _____

Upgrade ___ STD 5 Yr ___

Approved by _____

Date_____

Name of System: City of Juliaetta Wastewater Treatment Plant

Legal Owner of Treatment System City of Juliaetta

System Address: 1666 Highway 3

City: Juliaetta **State:** ID **Zip Code:** 83535

Contact Person:_____ **Title:** _____

Business Phone Number: (___)_____ **Email** _____

Treatment System - Design Flow/Actual Flow ____/____
(MGD) (MGD)

Treatment Plant Classification Worksheet is (Check one):

☐ **Initial System Rating** ☐ **System Upgrade** ☐ **Standard 5 Year Rating**

Date of last system classification rating (if applicable) ____

☐ **Attach a flow schematic or hydraulic flow diagram of the treatment facility to this treatment plant classification worksheet when submitting to DEQ.**

Instructions:

Use this rating form for all types of public wastewater treatment plants, facilities, or systems[D-16] that treat domestic and/or industrial wastewater including, but not limited to traditional biological and mechanical treatment processes, large soil absorption systems, community drainfields, and wastewater lagoon systems. Fill out ONE form for the wastewater treatment facility including all sequential, parallel or multiple treatment processes for both effluent and solids that provide treatment of all wastewater introduced into the system.

How to Assign Points:

Evaluate each item listed in the table below and place the specified point value next to each item selected. *Each unit process should have points assigned only once* .Add the total number of points selected to determine the class of the treatment system. Definitions describing all configurations, names, and/or reasons why rating points are or are not assigned to a particular item are provided for those items with a small D-number behind the item, i.e. D-1. Check the definition if unsure whether a particular treatment plant process qualifies for the point value shown.

Treatment facilities will be classified as VSWW, Class I, Class II, Class III or Class IV with IV being the largest and most complex. *Mail the completed, signed form to the Department of Environmental Quality 1410 N. Hilton, Boise, ID 83706 Attention: Adam Bussan. Keep a photocopy of the original form for your files.*

Item	Points	Your System
System Size (2 to 20 points)		
Number of Connections (for information only)	(not scored)	
Maximum population served, peak day (1 point minimum to 10 point maximum) 800	1 point/10,000 or part	1
Design flow (average/day) or peak months (average/day) Whichever is larger (1 point min to 10 point max) 0.057 mgd avg day	1 point/MGD or part	1

Item	Points	Your System
Variation in Raw Wastewater (0 to 6 points) [1]		
Variations do not exceed those normally or typically expected	0 points	
Recurring deviations/excessive variations of 100% to 200% in strength/flow	2 points	
Recurring deviations/excessive variations of more than 200% in strength/flow	4 points	
Raw wastewater subject to toxic waste discharges	6 points	
Impact of septage or truck-hauled wastewater (0 to 4 points)	0-4 points	
Preliminary Treatment Process		
Plant pumping of main flow	3 points	3
Screening, comminution	3 points	3
Grit removal	3 points	3
Equalization	1 point	0
Primary Treatment Process		
Primary clarifiers	5 points	5
Imhoff tanks, septic tanks, or similar (combined sedimentation/digestion)[D-8]	5 points	0
Secondary Treatment Process		
Fixed-film reactor[D-7]	10 points	0
Activated sludge[D-1]	15 points	15
Stabilization ponds or lagoon without aeration	5 points	0
Stabilization ponds or lagoon with aeration	8 points	0
Membrane Biological Reactor (MBR) – Basic MBR which combines activated sludge (minus secondary clarification) and membrane filtration.[D-17]	15 points	0
Tertiary Treatment Process		
Polishing ponds for advanced wastewater treatment	2 points	0
Chemical/physical advanced wastewater treatment w/o secondary[D-5]	15 points	0
Chemical/physical advanced wastewater treatment following secondary[D-4]	10 points	0
Biological or chemical/biological advanced wastewater treatment[D-2]	12 points	0
Nitrification by designed extended aeration only	2 points	0
Ion exchange for advanced wastewater treatment	10 points	0
Reverse osmosis, electrodialysis and other membrane filtration techniques for advanced wastewater treatment	15 points	0
Advanced wastewater treatment chemical recovery, carbon regeneration	4 points	0
Media filtration (removal of solids by sand or other media) [D-13]	5 points	0
Additional Treatment Processes		
Chemical additions (2 points each for a max of 6 points)[D-3]	0-6 points	0
Dissolved air floatation (for other than sludge thickening)	8 points	0
Intermittent sand filter	2 points	0
Recirculating intermittent sand filter	3 points	0
Microscreens	5 points	0
Generation of oxygen	5 points	0

Solids Handling		
Solids stabilization (used to reduce pathogens, volatile organic chemicals & odors include lime or similar treatment and thermal conditioning)[D-15]	5 points	0
Gravity thickening	2 points	0
Mechanical dewatering of solids[D-11]	8 points	8
Anaerobic digestion of solids	10 points	0
Aerobic digestion of solids	6 points	0
Evaporative sludge drying	2 points	0
Solids reduction (including incineration, wet oxidation)	12 points	0
On-site landfill for solids	2 points	0
Solids composting[D-14]	10 points	0
Land application of biosolids by contractor [D-9]	2 points	0
Land application of biosolids by facility operator in responsible charge	10 points	0
Disinfection (0 to 10 points maximum)		
No disinfection	0 points	0
Chlorination (including chlorine dioxide or chloramines) or ultraviolet irradiation	5 points	5
Ozonation	10 points	0
Effluent Discharge (0 to 10 points maximum)		
No discharge	0 points	0
Discharge to surface water receiving stream[D-6]	0 points	0
Mechanical post aeration[D-12]	2 points	0
Land treatment with surface disposal or land treatment with subsurface disposal [D-10]	4 points	0
Direct recycle and reuse	6 points	0
Instrumentation (0 to 6 point maximum)		
SCADA or similar instrumentation systems to provide data with no process operation	0 points	0
SCADA or similar instrumentation systems to provide data with limited process operation	2 points	0
SCADA or similar instrumentation systems to provide data with moderate process operation	4 points	0
SCADA or similar instrumentation systems to provide data with extensive or total process operation	6 points	0
Laboratory Control (0 to 15 point maximum) [2]		
Bacteriological/Biological Laboratory Control (0 to 5 point maximum)		
Lab work done outside the treatment plant	0 points	0
Membrane filter procedures	3 points	3
Use of fermentation tubes or any dilution method; fecal coliform determination	5 points	5
Chemical/Physical Laboratory Control (0 to 10 point maximum)		
Lab work done outside the treatment plant	0 points	0
Push-button or visual (colorimetric) methods for simple tests such as pH, settleable solids	3 points	3
Additional procedures such as DO, COD, BOD, gas analysis, titrations,		

solids, volatile content	5 points	0
More advanced determinations such as specific constituents; nutrients, total oils, phenols	7 points	0
Highly sophisticated instrumentation such as atomic absorption, gas chromatography	10 points	0
	TOTAL POINTS FOR YOUR SYSTEM	55

System Classification Key	**Classification**
A system comprised of only one of the following wastewater treatment processes: aerated lagoon (s), non-aerated lagoons, primary treatment, or LSAS; and associated collection system also meets the definition of a very small wastewater system (VSWWS).	☐ VSWWS
0-30 points	☐ Class I
31-55 points	■ Class II
56-75 points	☐ Class III
76 or greater	☐ Class IV

Footnote [1] The key concept is frequency and/or intensity of deviation or excessive variation from normal or typical fluctuations; such deviation can be in terms of strength, toxicity, shock loads, I/I, with points from 0-6.

Footnote [2] The key concept is to credit laboratory analyses done on-site by plant personnel under the direction of the operator in direct responsible charge with points from 0-15.

_____/_____

Signature of Legal Owner or Owner's Representative Date

Wastewater Treatment Definitions

D-1. **Activated Sludge** - Wastewater treatment by aeration of suspended organisms followed by secondary clarification, including extended aeration, oxidation ditches, Intermittent Cycle Extended Aeration system (ICEAS), and other similar processes. A sequencing batch reactor with the purpose of providing this form of treatment would be rated under this category.

D-2. **Biological or chemical/biological advanced wastewater treatment** - The advanced treatment of wastewater for nutrient removal including nitrification, denitrification, or phosphorus removal utilizing biological or chemical processes or a combination. If the facility is designed to nitrify based solely on detention time in an extended aeration system, only the points for nitrification by designed extended aeration should be given.

D-3. **Chemical addition** - The addition of a chemical to wastewater at an application point for the purposes of adjusting pH or alkalinity, improving solids removal, dechlorinating, removing odors, providing nutrients, or otherwise enhancing treatment, excluding chlorination for disinfection of effluent and the addition of enzymes or any process included in the Tertiary Chemical/Physical Processes. The capability to add a chemical at different application points for the same purpose should be rated as one application; the capability to add a chemical(s) to dual units should be rated as one application; and the capability to add a chemical at different application points for different purposes should be rated as separate applications.

D-4. **Chemical/physical advanced treatment following secondary** - The use of chemical or physical advanced treatment processes following (or in conjunction with) a secondary treatment process. This would include processes such as carbon adsorption, air stripping, chemical coagulation, and precipitation, etc.

D-5. **Chemical/physical advanced treatment without secondary** - The use of chemical or physical advanced treatment processes without the use of a secondary treatment process. This would include processes such as carbon adsorption, air stripping, chemical coagulation, precipitation, etc.

D-6. **Discharge to Receiving Water** - Treatment processes present at the facility are designed to achieve NPDES permit limitations that have already factored in the sensitivity of the receiving stream. Consequently, no additional points are assigned to rate the receiving stream separately from the facility treatment processes.

D-7. **Fixed-film reactor** - Biofiltration by trickling filters or rotating biological contactors followed by secondary clarification.

D-8. **Imhoff tanks (or similar)** - Imhoff tanks, septic tanks, spirogester, clarigester, or other single unit for combined sedimentation and digestion.

D-9. **Land application of biosolids by contractor** - The land application or beneficial reuse of biosolids by a contractor outside of the control of the operator in direct responsible charge of the wastewater treatment facility.

D-10. **Land treatment and disposal (surface or subsurface)** - The ultimate treatment and disposal of the effluent onto the surface of the ground by rapid infiltration or rotary distributor or by spray irrigation. Subsurface treatment and disposal would be accomplished by infiltration gallery, injection, or gravity or pressurized drainfield.

D-11. **Mechanical dewatering** - The removal of water from sludge by any of the following processes and including the addition of polymers in any of the following: vacuum filtration; frame, belt, or plate filter presses; centrifuge; or dissolved air floatation.

D-12. **Mechanical post-aeration** - The introduction of air into the effluent by mechanical means such as diffused or mechanical aeration. Cascade aeration would not be assigned points.

D-13. **Media Filtration** - The advanced treatment of wastewater for removal of solids by sand or other media or mixed media filtration.

D-14. **Solids composting** - The biological decomposition process producing carbon dioxide, water, and heat. Typical methods are windrow, forced air-static pile, and mechanical.

D--15. **Solids stabilization** - The processes to oxidize or reduce the organic matter in the sludge to a more stable form. These processes reduce pathogens or reduce the volatile organic chemicals and thereby reduce the potential for odor. These processes would include lime (or similar) treatment and thermal conditioning. Other stabilization processes such as aerobic or anaerobic digestion and composting are listed individually.

D-16 **Wastewater Treatment Facility**. Any physical facility or land area for the purpose of collecting, treating, neutralizing or stabilizing pollutants including treatment plants, the necessary intercepting, outfall and outlet sewers, pumping stations integral to such plants or sewers, equipment and furnishing thereof and their appurtenances. A treatment facility may also be known as a treatment system, wastewater treatment system, wastewater treatment facility, or wastewater treatment plant (IDAPA 58.01.16.010).

D-17 **Membrane Biological Reactor (MBR) Point Factoring -** The points assigned to the basic MBR unit does not include points for any additional treatment processes such as phosphorus removal, nitrification, denitrification, land application, rapid infiltration basins, lagoons, etc. Points must be assigned separately to each additional treatment process beyond the basic MBR unit. Additional treatment processes may vary on a case-by-case basis.