ENGINEERING, REIMAGINED

PRELIMINARY ENGINEERING REPORT FOR VAUGHN SANITARY SEWER IMPROVEMENTS

Prepared for Vaughn Cascade County Water and Sewer District

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August 2024

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0.0 EXECUTIVE SUMMARY

The Vaughn Cascade County Water and Sewer District (District) owns and operates wastewater collection and treatment facilities that serve the community of Vaughn, Montana. These facilities operate under a Montana Pollution Discharge Elimination System Permit (MPDES) issued and enforced by the Montana Department of Environmental Quality (DEQ).

The existing wastewater system serving Vaughn consists of a central collection system, one main lift station, the wastewater treatment facility, an effluent lift station, and outfall force main. The sanitary sewer system contains approximately 6,159 ft of vitrified clay pipe (VCP) gravity sewer mains which were originally installed in 1963, making them over 60 years old. In their current state, the sanitary sewer system poses various health, sanitation, and sustainability issues. Specifically, the VCP mains contain breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions, which has caused excessive infiltration and inflow (I/I). Additionally, approximately 472 lineal ft of the VCP gravity sewer mains are 6 inches in diameter, which is undersized according to Montana Department of Environmental Quality (DEQ) design criteria. This Preliminary Engineering Report (PER) investigates alternatives to replace the aging VCP sewer mains to reduce I/I and comply with Montana DEQ design criteria.

1.0 PROJECT PLANNING

1.1 LOCATION

Vaughn is a census-designated place (CDP) in Cascade County, Montana. Vaughn located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, as shown in Figure 1. The sewer facilities are owned, operated, and managed by the District. The wastewater treatment facility is located at Latitude 47.547222°, Longitude -111.556111°. The District boundaries are located in Sections 24 and 25, Township 21 North Range 5 West; and Sections 1, 2, 11 and 12 of Township 33 North Range 1 East. The general location of Vaughn is shown in **Figure 1**. The boundaries of the district are shown in **Figure 2**.

Figure 1: General Location Map

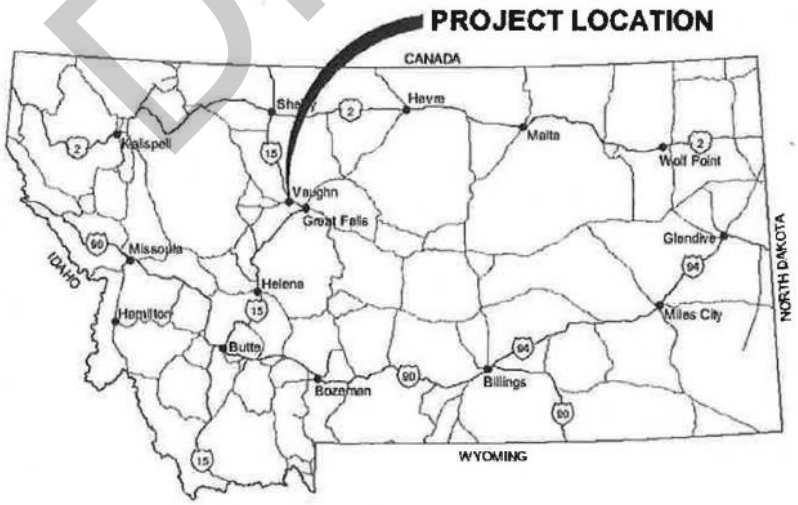
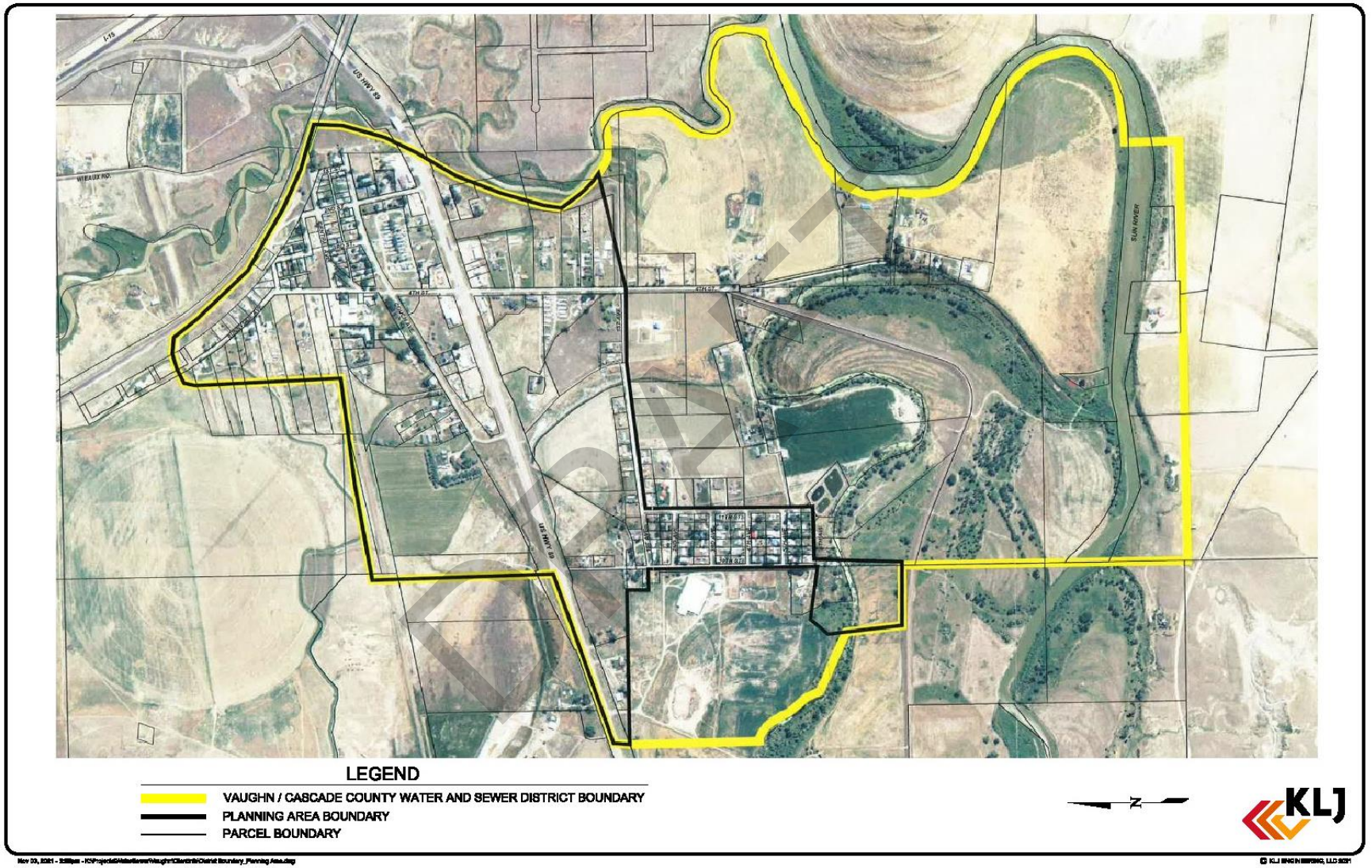


Figure 2: Vaughn Cascade County Water and Sewer District Boundary Map



1.1.1 GEOGRAPHY AND LAND USE

The land use in the District is agricultural and residential. According to the Montana Natural Heritage Program Land Cover report, the proportion of land use in the area consists approximately of: cultivated crops (51%), great plains mixed grass prairie (19%), great plains floodplain (7%), introduced upland vegetation (5%), developed open space (4), other roads (3%), low intensity residential (3%), interstate (2%), and open water (2%) [1]. Most of the land surrounding Vaughn is privately-owned. There will be no impact to formally classified lands or lands classified as prime farmland.

1.1.2 CLIMATE

The nearest city with weather data is Great Falls, Montana, which is approximately 12 miles southeast of Vaughn. In Great Falls, the summers are short, warm, and mostly clear and the winters are freezing, snowy, windy, and partly cloudy. Over the course of the year, the temperature typically varies from 18°F to 86°F and is rarely below -8°F or above 96°F. [2]

The hot season lasts for 2.7 months, from June 18 to September 8, with an average daily high temperature above 76°F. The hottest month of the year in Great Falls is July, with an average high of 85°F and low of 56°F. The cold season lasts for 3.5 months, from November 16 to March 2, with an average daily high temperature below 45°F. The coldest month of the year in Great Falls is December, with an average low of 20°F and high of 36°F. [2]

1.2 ENVIRONMENTAL RESOURCES PRESENT

All state and federally funded projects are subject to either the Montana Environmental Policy Act (MEPA) or the National Environmental Policy Act of 1969 (NEPA), or both. MEPA seeks to avoid or mitigate adverse impacts on the natural and human environment by mandating careful consideration of the potential impacts of any development assisted with state funds or approved by a state agency. NEPA establishes national policy, goals, and procedures for protecting, restoring, and enhancing environmental quality. In accordance with NEPA and MEPA the Uniform Environmental Checklist was completed and can be found in **EXHIBIT K**. Maps and reports to support the Uniform Environmental Checklist can be found in **EXHIBIT L**.

The following agencies were contacted to identify any potential environmental impacts associated with the planned project. Correspondence with these agencies can be found in **EXHIBIT I**.

- Cascade County
- Montana Department of Commerce, Census and Economic Information Center
- Montana Department of Environmental Quality
- Montana Department of Labor and Industry
- Montana Department of Natural Resources and Conservation
- Montana Department of Transportation
- Montana Fish, Wildlife & Parks
- Montana State Historic Preservation Office
- U.S. Army Corps of Engineers
- U.S. Bureau of Land Management
- U.S. Department of Transportation
- U.S. Environmental Protection Agency
- U.S. Fish & Wildlife Service
- U.S. Natural Resource Conservation Service
- Little Shell Tribe of Chippewa Indians

The environmental resources present in the project area is summarized below.

1.2.1 LAND USE CHANGES

The land use in the District is agricultural and residential. Most of the land surrounding Vaughn is privately-owned. There is no land near the proposed project area that is administered by a public entity. The land cover map from the Montana Natural Heritage Program, the land management map from the Montana Natural Heritage Program, and the Natural Resource Conservations Service Soil Survey map is attached in **EXHIBIT L** [1, 3].

1.2.2 WILDLIFE AND VEGETATION

Fauna of the area consists of typical mammalian species found in the intermountain west, including mule deer, whitetail deer, antelope, coyote, rabbit, skunk, weasel, rodents, and others. Common bird species include the black-billed magpie, American robin, Canadian goose, sparrow, warbler, common waterfowl, other raptors, game birds and others. The project area does not fall within the general habitat for greater sage grouse. The United States Fish and Wildlife Service species list report, the Montana Natural Heritage Program species observations report, and the Montana Sage Grouse Habitat map is attached in **EXHIBIT L** [4, 1, 5].

1.2.3 WATER RESOURCES

According to the Cascade County Growth Policy document, water for the Vaughn Cascade County Water and Sewer PWS is supplied by two wells located near the Sun River south of Highway 200 [6]. Well 1 was drilled to a depth of 140 feet and has a static water level of 7.2 feet [6]. It pumps at 179 GPM. Well 2 was drilled to a depth of 134.5 feet and has a static water level of eight feet. It pumps at 350 GPM [6].

There are 9 active underground storage tanks in the city of Vaughn, according to Montana DEQ. Five of the tanks are located near the Sinclair Gas Station at 133 US-89 (Latitude 47.556908°, Longitude -111.551087°), and the other four tanks are located near the Glacier Gateway Conoco gas station at 99 US-89 (Latitude 47.558477°, Longitude -111.544212°) [7]. The project area does not intersect with the underground storage tanks.

1.2.4 WETLANDS AND FLOOD PLAINS

There are two streams in the District: Muddy Creek and the Sun River. Muddy Creek, located northeast of the District, is classified by the National Wetlands Inventory as a freshwater emergent wetland, freshwater forested/shrub wetland, and riverine. The Sun River, located south of the District, is classified by the National Wetlands inventory as a forested/shrub wetland and riverine. There is also an unnamed tributary directly south of the wastewater treatment facility which is classified by the National Wetlands inventory as a forested/shrub wetland and freshwater pond. The project area does not intersect with these streams and is confined to previously disturbed areas. The project area is also outside of the 100-year floodplain and is protected by a provisionally accredited levee. Correspondence with the Cascade County Floodplain Administrator is attached in **EXHIBIT I**. The National Wetland Inventory (NWI) map and FEMA floodplain map is attached in **EXHIBIT L.**

1.2.5 HISTORICAL, CULTURAL, AND ARCHAEOLOGICAL SITES

Cultural resources include historic and prehistoric archaeological sites, historic architecture, engineering features and structures and resources of significance. The Montana State Historic Preservation Office (SHPO) was contacted to complete a cultural resource file search for the Vaughn area. The Montana SHPO stated that, “as long as there will be no disturbance or alteration to structures over fifty years of age and the project will be kept within previously disturbed ground, we feel that there will be no cultural or historic properties affected by this undertaking.” Their correspondence is attached in **EXHIBIT I** [8].

1.2.6 SOCIOECONOMIC IMPACTS

There is no known disproportionate increase in environmental or public health impacts to minority and low-income persons due to this project. The entire community would benefit from improving the sewer collection system as it would reduce operation and maintenance costs, reduce I/I, and improve the capacity of the wastewater treatment facility, which would provide environmental and economic benefits. There are no anticipated negative impacts regarding environmental justice. The EPA EJScreen report is attached in **EXHIBIT L** [9].

1.3 POPULATION TRENDS

The total population, percent of population below poverty level, and median household income for the Vaughn CDP were obtained from the US Census Bureau, and are shown in **Table 1** and **Table 2** below [10]. In 2022, the Vaughn

CDP population was 975, 12.1% of the population was below the poverty line, and the median household income was $45,000. From 2011 to 2022, the population in Vaughn CDP increased by 2.59%.

Table 1: Vaughn CDP Socioeconomic Characteristics

Year	Vaughn CDP Population	Cascade County Population	Vaughn Population Below Poverty Level	Median Household Income
2011	758	81,734	18.1%	$39,276
2012	781	81,657	10.9%	$40,909
2013	812	82,241	11.9%	$45,417
2014	804	82,118	12.6%	$48,068
2015	863	81,959	14.3%	$48,558
2016	824	81,655	14.8%	$51,458
2017	733	81,729	9.8%	$57,813
2018	730	81,756	13.4%	$49,531
2019	807	81,393	18.2%	$52,250
2020	877	81,346	15.5%	$38,906
2021	840	84,511	13.5%	$40,000
2022	975	84,864	12.1%	$45,000

Table 2: Vaughn CDP and Cascade County Population Change Over Time

Year	Vaughn CDP Population	Cascade County Population	Vaughn CDP Percent Change	Cascade County Percent Change
2011	758	81,734	-	-
2012	781	81,657	3.03%	-0.09%
2013	812	82,241	3.97%	0.72%
2014	804	82,118	-0.99%	-0.15%
2015	863	81,959	7.34%	-0.19%
2016	824	81,655	-4.52%	-0.37%
2017	733	81,729	-11.04%	0.09%
2018	730	81,756	-0.41%	0.03%
2019	807	81,393	10.55%	-0.44%
2020	877	81,346	8.67%	-0.06%
2021	840	84,511	-4.22%	3.89%
2022	975	84,864	16.07%	0.42%
		Average	**2.59%**	**0.35%**

1.4 COMMUNITY ENGAGEMENT

The City of Vaughn has engaged the community regarding this project with a public hearing. The public hearing was held on August 20, 2024, at the Vaughn City Hall. The goal of the meeting was to inform the community of the plans for sewer system improvements and to request opinions on the plans and options being presented to the City. The public was provided information about the plans, alternatives analyzed, and the estimated cost for the construction. The meeting was recorded, and its minutes can be found at https://vaughnwaterandsewer.com/board-meetings-and-minutes. The public hearing meeting minutes are also attached in **EXHIBIT J**.

2.0 EXISTING FACILITIES

2.1 LOCATION MAP

- A map of the general location of Vaughn is shown in **Figure 1**.
- A map of the boundaries of the District is shown in **Figure 2**.
- A map of the District's sanitary sewer system is shown in **Figure 3**.
- A map of the project area is shown in **Figure 4**.

2.2 HISTORY

The existing wastewater system serving Vaughn consists of a central collection system, one main lift station, the wastewater treatment facility, an effluent lift station, and outfall force main. The collection system contains approximately 17,665 lineal feet of sanitary mains, 2,987 lineal feet of force mains, 1,277 lineal feet of sanitary private services, and one 200 gpm lift station. The VCPs were installed in 1963, and the original PVC pipes were installed in 1973. Also installed in 1973 is a 10" cured-in-place (CIP) concrete pipe along 1st Ave which crosses an irrigation ditch. The pipe sizes, materials, and length of the sanitary sewers are shown in **Table 3** below.

The wastewater system services two distinct areas within the District: the originally platted community north of Highway 89, and the Big Sky Vista south of Highway 89. There are a few businesses located along Highway 89, but otherwise the system serves residential areas. The two areas are connected by 5,200 ft of 10-inch PVC gravity sewer main.

Table 3: Existing Collection System Pipe Sizes and Material

Pipe	Type	Size	Length (ft)
Sanitary Force Main	DIP	6-in	2,395
	PVC	3-in	531
		6-in	61
		Subtotal	2,987
Sanitary Main Lines	CIP	10-in	9
	PVC	6-in	446
		8-in	3,671
		10-in	7,380
	VCP	6-in	472
		8-in	4,333
		12-in	1,354
		Subtotal	17,665
Sanitary Private Service	PVC	4-in	1,173
		6-in	104
		Subtotal	1,277
		Grand Total	**21,930**

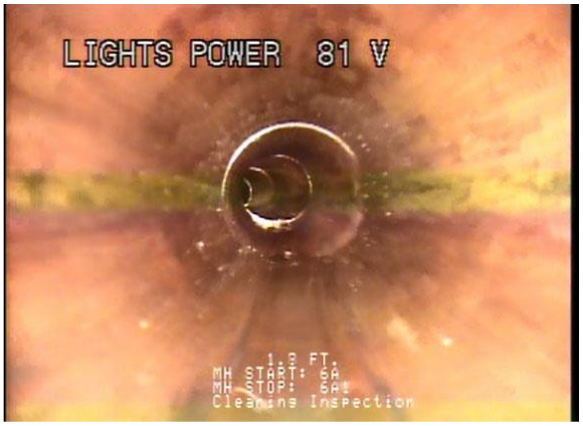
2.3 CONDITION OF EXISTING SYSTEM

The VCP mains are over 60 years old and contain breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions, which has caused excessive infiltration and inflow (I/I). In October 2018, the District had the sewer system inspected with cameras. A map of the TV inspection plan is shown in **EXHIBIT A**. The photos in **Figure 5** show the defects present in the VCP mains.

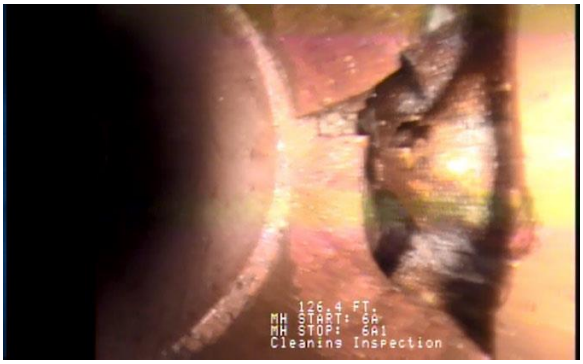
Figure 3: Vaughn Sanitary Sewer System Map

Figure 4: Project Area

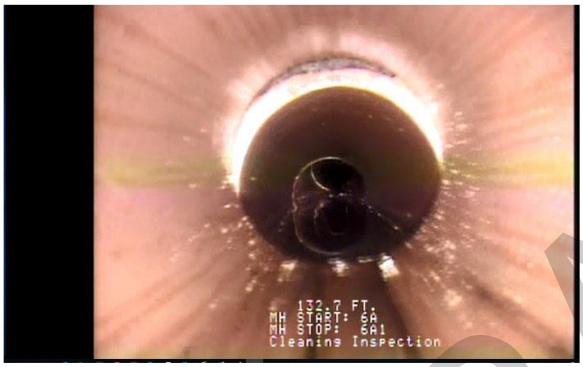
Figure 5: Photos of Defects Present in VCP Sewer Mains, 2018



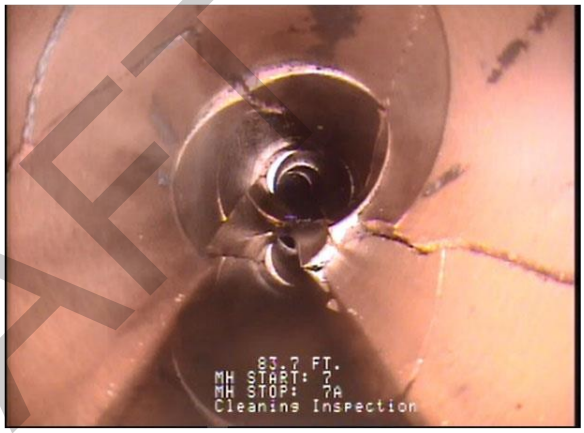
Poor pipe alignment



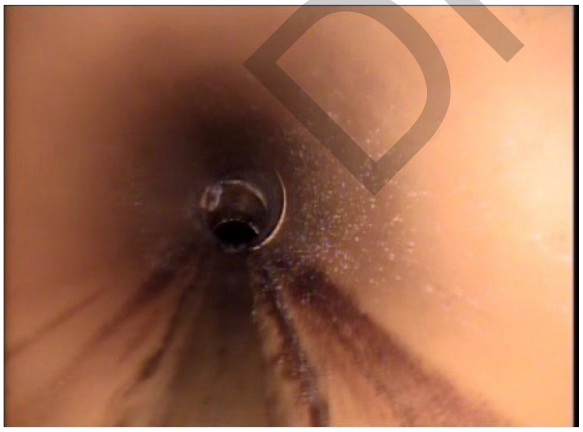
Hole in pipe with soil showing

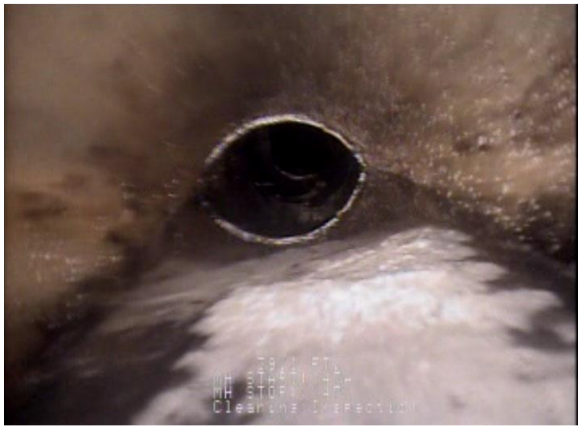


Offset joint and sag



Severely broken pipe





Severe sag in VCP main. The camera was unable to continue through this sag

2.4 FINANCIAL STATUS OF EXISTING SYSTEM

2.4.1 INCOME

In FY24, the city of Vaughn's income for wastewater was $181,900.

The community of Vaughn is largely residential as demonstrated by the breakdown of services that follow:

- Number of residential services: 209
- Number of commercial services: 16

2.4.2 ANNUAL O&M COSTS

In FY24, the city of Vaughn's O&M costs for wastewater was $162,700.

2.4.3 BUDGET

In FY24, the city of Vaughn's budget was $183,000.

2.5 WATER/ENERGY/WASTE AUDITS

There are no water, energy, or waste audits available at this time.

3.0 NEED FOR PROJECT

3.1 HEALTH, SANITATION, AND SECURITY

The VCP mains are over 60 years old and contain breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions, as shown in **Figure 5.** A breakdown of the health, sanitation, and security issues this causes is provided below:

- **Sewage Overflows**: Infiltration and inflow into the sewer system can cause or contribute to sanitary sewer overflows (SSOs), in which untreated sewage is discharged onto streets, sidewalks, or nearby waterbodies. These overflows not only pose public health risks due but may also contribute to pollution of surface waters if sanitary sewer overflows reach waterbodies.
- **Regulatory Violations**: Sewer overflows are considered violations of MPDES permits, potentially leading to enforcement action from state regulatory agencies if they are not addressed.
- **Diversion of Resources**: SSOs demand immediate attention to prevent health hazards and environmental damage. Often times, responding to SSOs requires pulling workers away from scheduled maintenance tasks. Areas affected by overflows also need to be disinfected to prevent the spread of disease.
- **Reduced Wastewater Treatment Capacity**: During heavy rainfall or snowmelt, the influx of additional water into the sewer system increases the volume of water that needs to be treated. This can cause the wastewater treatment facility to bypass treatment processes to handle the excess flow, which leads to decreased treatment and potential effluent violations.

3.2 AGING INFRASTRUCTURE

The VCP mains are over 60 years old and contain breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions, as shown in **Figure 5.** These issues can cause significant operational and environmental problems. A breakdown of the specific issues related to each of these defects is provided below:

- Breaks and Cracks
  - **Infiltration and Inflow (I/I)**: Breaks and cracks allow groundwater and stormwater to enter the sewer system, increasing the volume of water that needs to be treated and potentially overwhelming the system during wet weather.
  - **Exfiltration**: Sewage can leak out of the system through breaks and cracks, contaminating surrounding soil and groundwater, leading to environmental pollution.
  - **Blockages**: Debris can enter the system through breaks and cracks, leading to blockages and backups that disrupt the flow of sewage.
  - **Structural Integrity**: Over time, breaks and cracks weaken the structural integrity of the pipes, increasing the risk of pipe collapse.
- Offset Joints
  - **Flow Disruption**: Offset joints can disrupt the smooth flow of sewage, leading to reduced flow capacity and increased risk of blockages.
  - **Increased Sediment Accumulation**: Misaligned joints can create areas where sediment and debris accumulate, leading to blockages and reduced pipe capacity.
  - **Infiltration/Exfiltration**: Gaps in offset joints allow groundwater to infiltrate the system or sewage to exfiltrate, contributing to I/I issues and environmental contamination.
- Misaligned Pipes
  - **Reduced Hydraulic Efficiency**: Misaligned pipes create uneven flow paths, reducing the overall hydraulic efficiency of the sewer system and potentially causing backups.
  - **Increased Wear and Tear**: The uneven flow and pressure caused by misaligned pipes can lead to accelerated wear and tear on the system, increasing maintenance needs and the risk of failure.
  - **Increased Blockages**: Misaligned pipes create points where debris can catch and accumulate, leading to frequent blockages and requiring more frequent maintenance.
- Sagging Pipes
  - **Standing Water**: Sagging pipes create low points where water and solids can accumulate, leading to standing water or "bellies" in the sewer line. This stagnant water can cause sediment buildup and increase the risk of blockages.
  - **Increased Blockages**: Solids and debris are more likely to settle in sagging areas, leading to frequent blockages that disrupt the flow and require regular maintenance.
- Root Intrusions
  - **Blockages**: Tree roots can infiltrate sewer lines through cracks or joints, growing inside the pipes and creating significant blockages that impede flow and cause backups.
  - **Structural Damage**: As roots grow inside the pipes, they can cause cracks to widen, joints to separate further, and pipes to fracture, leading to major structural damage.

Breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions each contribute to significant operational challenges and risks in sewer systems. These issues can lead to blockages, flow disruptions, structural damage, environmental contamination, and increased maintenance costs, all of which undermine the reliability and sustainability of the sewer infrastructure. Addressing these defects promptly is essential to maintaining a functional and sustainable sewer system.

3.3 REASONABLE GROWTH

The VCP mains are over 60 years old and contain breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions, as shown in **Figure 5.** These issues increase operation and maintenance costs, increase I/I, reduce the capacity of the wastewater treatment facility, and can lead to environmental contamination. Replacing the deteriorating sanitary sewer mains will provide numerous economic and environmental benefits and will improve the District's ability to accommodate future growth.

4.0 ALTERNATIVES CONSIDERED

4.1 ALTERNATIVE 1 – NO ACTION

4.1.1 DESCRIPTION

For this alternative, no action would be taken. The sanitary sewer system would be left as it exists, and the operation and maintenance would continue as normal. This would not eliminate issues plaguing the system. The VCP sewer mains are over 60 years old and at the end of their expected service lives. In their current state, the sanitary sewer system poses various health, sanitation, and sustainability issues. Specifically, the PVC mains contain breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions, which has caused excessive infiltration and inflow (I/I). Eventually, the entire system is expected to fail, potentially leading to contamination of private and public property, and the loss of sanitary services.

4.1.2 DESIGN CRITERIA

There are no design criteria since no construction activity are planned.

4.1.3 PROJECT LOCATION MAP

- A map of the general location of Vaughn is shown in **Figure 1**.
- A map of the boundaries of the District is shown in **Figure 2**.
- A map of the District's sanitary sewer system is shown in **Figure 3**.
- A map of the project area is shown in **Figure 4**.

4.1.4 ENVIRONMENTAL IMPACTS

- The environmental resources present were discussed in **Section 1.2** of this report.
- The environmental impacts of this project were assessed in accordance with NEPA and MEPA using the Uniform Environmental Checklist, which can be found in **EXHIBIT K**.
- Agencies were contacted to identify any potential environmental impacts associated with the planned project. Correspondence with these agencies and their responses can be found in **EXHIBIT I.**

4.1.5 LAND REQUIREMENTS

Since there is no construction, there will be no land requirements.

4.1.6 POTENTIAL CONSTRUCTION PROBLEMS

Since there is no construction, there will be no construction problems.

4.1.7 COST ESTIMATE

The capital cost estimate for Alternative 1 is $0.00 because there will be construction activities.

- Alternative 1 Capital Cost: $0.00
- Alternative 1 O&M Cost:

4.2 ALTERNATIVE 2 – BASIC BUILD

4.2.1 DESCRIPTION

This alternative involves replacing approximately 3,034 ft of VCP sewer mains throughout the city using the open trench method as well as relining 13 manholes. The sewer mains will be replaced with PVC pipe to 8-inch minimum diameter. The sanitary sewer pipes being replaced in the southwest side of town are located in the NW ¼ of Section 25 Township 21 North, Range 1 East. The sanitary sewer pipes being replaced in the northeast side of town are located in the NE ¼ of Section 24 Township 21 North, Range 1 East.

4.2.2 DESIGN CRITERIA

The Montana DEQ establishes design standards and requires review and approval of public sewer system improvements. These design standards are outlined in DEQ Circular 2 and serve as the primary design standards this alternative [11].

4.2.3 PROJECT LOCATION MAP

- A map of the general location of Vaughn is shown in **Figure 1**.
- A map of the boundaries of the District is shown in **Figure 2**.
- A map of the District's sanitary sewer system is shown in **Figure 3**.
- A map of the project area is shown in **Figure 4**.
- For the conceptual design of Alternative 2, See **EXHIBIT B.**

4.2.4 ENVIRONMENTAL IMPACTS

- The environmental resources present were discussed in **Section 1.2** of this report.
- The environmental impacts of this project were assessed in accordance with NEPA and MEPA using the Uniform Environmental Checklist, which can be found in **EXHIBIT K**.
- Agencies were contacted to identify any potential environmental impacts associated with the planned project. Correspondence with these agencies and their responses can be found in **EXHIBIT I.**

4.2.5 LAND REQUIREMENTS

For the improvements occurring in the south end of town, the 12" PVC pipes are located along 11th St within the City-owned ROW. The 8" VCPs which connect to the 12" PVC pipes are located on private property. For the improvements occurring in the north end of town, most of the 8" VCPs are located within the City-owned ROW. However, there is one 8" VCP main which connects to 3rd St which is located on private property. The 6" VCPs which connect to Morgan Ave also extend onto private property. The City will need to secure easements with the corresponding landowners.

4.2.6 POTENTIAL CONSTRUCTION PROBLEMS

Because some of the sewer mains extend onto private property, there will be fences, trees, shrubs, and debris which will need to be removed to excavate the trenches necessary to replace the sewer mains. The contractor will be responsible for returning the private property to its original condition.

Access to the residences, businesses, the school, and the church must also be maintained. The roadway in both directions must be at least partially opened to allow for traffic. Consideration will need to be made for maintaining access, rerouting traffic, and providing temporary parking if needed.

4.2.7 COST ESTIMATE

The capital costs and annual O&M costs for "Alternative 2 – Basic Build" was estimated.

- The O&M cost estimate for alternative 2 is shown in **EXHIBIT E** in the Appendices.
- The construction cost estimate for alternative 2 is shown in **EXHIBIT G** in the Appendices.

The O&M cost and construction cost estimates are summarized below.

- Alternative 2 O&M Cost:
- Alternative 2 Capital Cost: $3,425,760

4.3 ALTERNATIVE 3 – FULL BUILD

4.3.1 DESCRIPTION

This alternative involves replacing approximately 3,034 ft of VCP sewer mains throughout the city using the open trench method as well as relining 13 manholes. The sewer mains will be replaced with PVC pipe to 8-inch minimum diameter. The sanitary sewer pipes being replaced in the southwest side of town are located in the NW ¼ of Section 25 Township 21 North, Range 1 East. The sanitary sewer pipes being replaced in the northeast side of town are located in the NE ¼ of Section 24 Township 21 North, Range 1 East.

In addition, this alternative involves replacing the CIP pipe along 1st Ave which crosses the irrigation ditch near Latitude 47.552927°, Longitude -111.552163° in the NE ¼ of the NW ¼ of Section 25 Township 21 North, Range 1 East. This pipe would need to be replaced in the Spring season when the irrigation ditch is not running. If the pipe were to be replaced when water is present, the ditch would need to be temporarily dammed off and the water would need to be bypassed while the pipe is being replaced, which would incur significant construction costs.

4.3.2 DESIGN CRITERIA

The Montana DEQ establishes design standards and requires review and approval of public sewer system improvements. These design standards are outlined in DEQ Circular 2 and serve as the primary design standards this alternative [11].

4.3.3 PROJECT LOCATION MAP

- A map of the general location of Vaughn is shown in **Figure 1**.
- A map of the boundaries of the District is shown in **Figure 2**.
- A map of the District's sanitary sewer system is shown in **Figure 3**.
- A map of the project area is shown in **Figure 4**.
- For the conceptual design of Alternative 3, see **EXHIBIT C**.

4.3.4 ENVIRONMENTAL IMPACTS

- The environmental resources present were discussed in **Section 1.2** of this report.
- The environmental impacts of this project were assessed in accordance with NEPA and MEPA using the Uniform Environmental Checklist, which can be found in **EXHIBIT K**.
- Agencies were contacted to identify any potential environmental impacts associated with the planned project. Correspondence with these agencies and their responses can be found in **EXHIBIT I.**

4.3.5 LAND REQUIREMENTS

For the improvements occurring in the south end of town, the 12" PVC pipes are located along 11th St within the City-owned ROW. The 8" VCPs which connect to the 12" PVC pipes are located on private property. For the improvements occurring in the north end of town, most of the 8" VCPs are located within the City-owned ROW. However, there is one 8" VCP main which connects to 3rd St which is located on private property. The 6" VCPs which connect to Morgan Ave also extend onto private property. The 10" CIP pipe in the irrigation ditch along 1st Ave also extends onto private property. The City will need to secure easements with the corresponding landowners.

4.3.6 POTENTIAL CONSTRUCTION PROBLEMS

Because some of the sewer mains extend onto private property, there will be fences, trees, shrubs, and debris which will need to be removed to excavate the trenches necessary to replace the sewer mains. The contractor will be responsible for returning the private property to its original condition.

Access to the residences, businesses, the school, and the church must also be maintained. The roadway in both directions must be at least partially opened to allow for traffic. Consideration will need to be made for maintaining access, rerouting traffic, and providing temporary parking if needed.

4.3.7 COST ESTIMATE

The capital costs and annual O&M costs for "Alternative 3 – Full Build" was estimated.

- The O&M cost estimate for alternative 3 is shown in **EXHIBIT F** in the Appendices.
- The construction cost estimate for alternative 3 is shown in **EXHIBIT H** in the Appendices.

The O&M cost and construction cost estimates are summarized below.

- Alternative 3 O&M Cost:
- Alternative 3 Capital Cost:

5.0 SELECTION OF PREFERRED ALTERNATIVE

5.1 LIFE CYCLE COST ANALYSIS

A life cycle cost analysis was completed for all alternatives based on a 20-year life span incorporating the initial costs, the annual O&M costs of the life span, and the Real Discount Rates taken from Appendix C of the Office of Management and Budget (OMB) circular A-94 for the calendar year 2023, revised December 28, 2023 [12]. Using 2.5 percent rate (i) and an assumed 20-year period (n), the uniform series present worth (USPW) and the single payment present worth (SPPW) factors were determined. The USPW factor was used to convert annual O&M costs to present worth, and the SPPW factor was used to convert the 20-year salvage value to present worth.

$$USPW\ Factor = \frac{(1+i)^n - 1}{i(1+i)^n}$$

$$SPPW\ Factor = (1+i)^{-n}$$

$$Present\ Worth\ Costs = C + O\&M$$

$$Net\ Present\ Value = C + O\&M - S$$

Where:

USPW Factor	=	Uniform Series Present Worth Factor
SPPW Factor	=	Single Payment Present Worth Factor
i	=	Interest rate
n	=	Number of years
C	=	Capital Cost
O&M	=	Operation and maintenance costs, in terms of present worth value
S	=	Salvage value, in terms of present worth value

The life cycle cost analyses for the three alternatives are shown in **Table 4**, **Table 5**, and **Table 6**. A summary of the life cycle cost analyses is shown in **Table 7** below.

Table 4: Life Cycle Cost Analysis of Alternative 1 - No Action

Table 5: Life Cycle Cost Analysis of Alternative 2 – Basic Build

Table 6: Life Cycle Cost Analysis of Alternative 3 – Full Build

Table 7: Life Cycle Cost Analysis Summary

5.2 NON-MONETARY FACTORS

6.0 PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

6.1 PRELIMINARY PROJECT DESIGN

The details of the preliminary project design have been included in Section [x] with the appropriate design criteria discussed in Section [x].

6.2 PROJECT SCHEDULE

The anticipated project schedule is shown in **Table 8** below.

Table 8: Anticipated Project Schedule

Project Phase	Project Milestone	Estimated Date
Report Submission	Submit PER to Montana Department of Commerce	September 2024
Design	Notice to Proceed	June 2025
	Survey/Geotechnical Investigation	July 2025
	60% Design	September 2025
	90% Design	October 2025
	Final Design	December 2025
	Ad for Bid	December 2024
Bidding	Pre-bid Conference	January 2026
	Bid Opening/Award	February 2026
Construction	Notice to Proceed	March 2026
	Construction Begins	March 2026
	Substantial Completion	June 2027
	Final Completion	July 2027

6.3 PERMIT REQUIREMENTS

Potential permits required for project include:

- Montana DEQ review of plans and specifications.
- Montana DEQ construction stormwater general permit
- Cascade County Building Permit

The Montana DEQ requires plans and specifications to be submitted for any new construction or modifications to sewer systems. The Montana DEQ also requires coverage the Construction Stormwater General Permit (Permit No. MTR100000) if a construction project disturbs 1 acre of land or more. If a permit is needed, the contractor will be responsible for obtaining permit coverage. Some requirements of this permit include: the development and maintenance of a Stormwater Pollution Prevention Plan (SWPPP), submittal of a Notice of Intent (NOI) to the Montana DEQ, and implementation of erosion and sediment controls and pollution prevention practices throughout the construction project.

6.4 SUSTAINABILITY CONSIDERATIONS

If no action was taken, the sanitary sewer system would be left as it exists, and the operation and maintenance would continue as normal. This would not eliminate issues plaguing the system. The severity of the issues would increase since the pipes are past their expected life span. Eventually, the entire system is expected to fail, potentially leading to contamination of private and public property, and the loss of sanitary services. Replacing the deteriorating sanitary sewer mains will provide numerous economic and environmental benefits and will improve the District's ability to accommodate future growth.

6.5 ENGINEER'S OPINION OF PROBABLE COSTS

6.6 ANNUAL OPERATING BUDGET

6.6.1 INCOME

6.6.2 ANNUAL O&M COSTS

6.6.3 DEBT REPAYMENTS

6.6.4 RESERVES

7.0 CONCLUSIONS AND RECOMMENDATIONS

The VCP mains in the city of Vaughn are over 60 years old and at the end of their expected service lives. In their current state, the sanitary sewer system poses various health, sanitation, and sustainability issues. Specifically, the VCP mains contain breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions, which has caused excessive infiltration and inflow (I/I). Additionally, approximately 472 lineal ft of VCP mains are 6 inches in diameter, which is undersized according to Montana Department of Environmental Quality (DEQ) design criteria.

With these issues in mind, the City of Vaughn opted to replace the outdated and inadequate pipes of the sanitary sewer system. Three alternatives were analyzed: "Alternative 1 – No Action," "Alternative 2 – Basic Build," and "Alternative 3 – Full Build".

Based on community engagement efforts, life cycle cost analyses, and analyses of non-monetary factors, "Alternative x" is recommended. In conclusion, updating the sanitary sewer system will provide various economic and environmental benefits, as well as improve the sustainability of the utility infrastructure for years to come.

8.0 REFERENCES

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9.0 APPENDICES

EXHIBIT A: SANITARY SEWER TV INSPECTION MAP

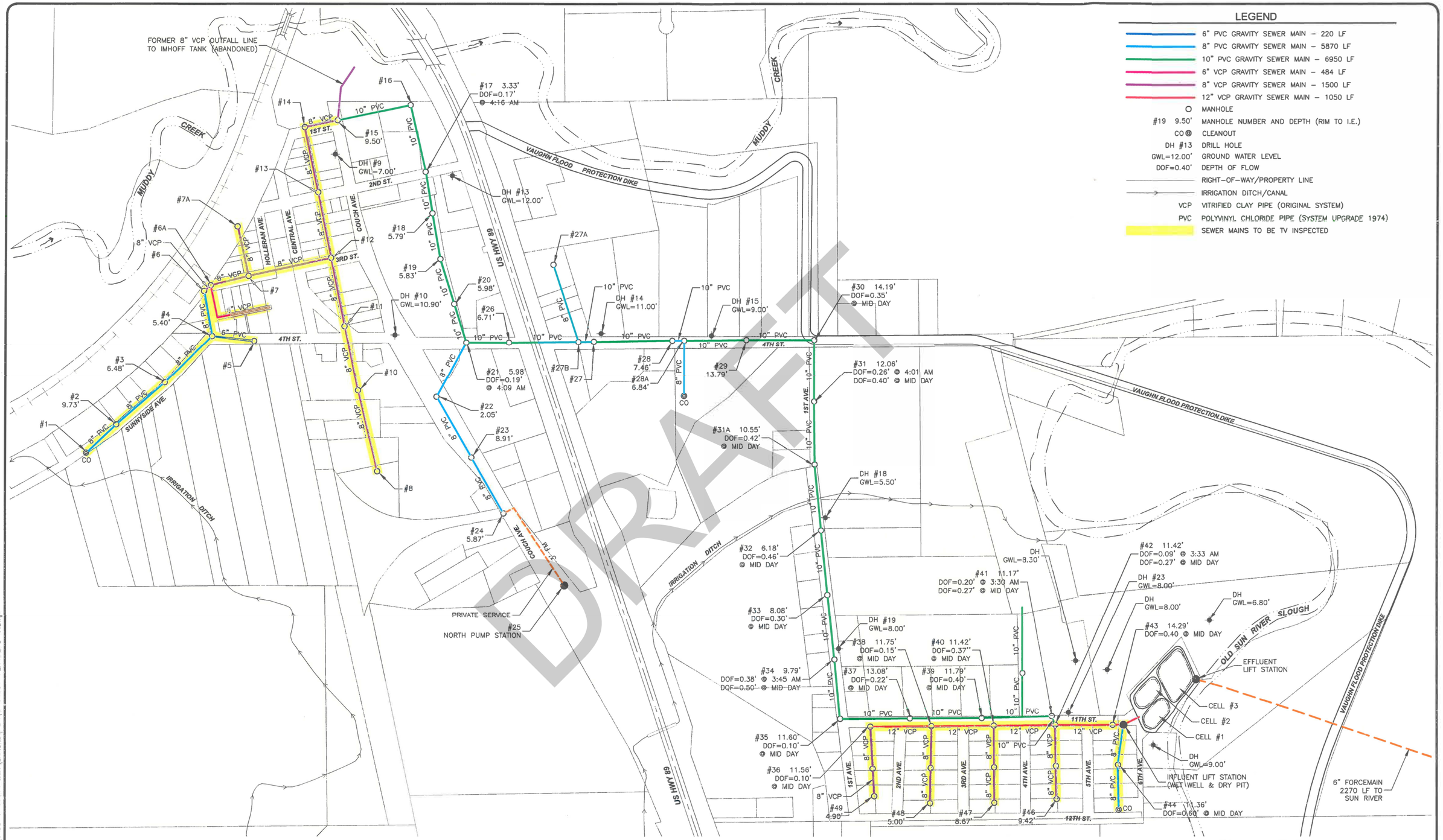

Figure 5.1
Existing Collection System
TV Inspection Plan

VAUGHN / CASCADE COUNTY SEWER DISTRICT
WASTEWATER PRELIMINARY ENGINEERING REPORT

GreatWest engineering®

F:\1-14114-Vaughn WW\CADD 1-14114 WWTL\Exhibits\PER\1-14114-PER-FG 5-1.dwg

EXHIBIT B: ALTERNATIVE 2 – BASIC BUILD LAYOUT

EXHIBIT C: ALTERNATIVE 3 – FULL BUILD LAYOUT

EXHIBIT D: ALTERNATIVE 1 – NO ACTION O&M COSTS

EXHIBIT E: ALTERNATIVE 2 – BASIC BUILD O&M COSTS

EXHIBIT F: ALTERNATIVE 3 – FULL BUILD O&M COSTS

EXHIBIT G: ALTERNATIVE 2 – BASIC BUILD CONSTRUCTION COST ESTIMATE

Preliminary Estimated Construction Costs
Alternative 2 - Basic Build
Vaughn Cascade County Water and Sewer District Sanitary Sewer Improvements
Vaughn, Montana
August 15, 2024

CONSTRUCTION COST					
ITEM	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITIES	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
EARTHWORK					
1	MOBILIZATION	LS	1	$ 216,000.00	$ 216,000.00
2	CLEARING AND GRUBBING	LS	1	$ 10,000.00	$ 10,000.00
3	REMOVE OBSTRUCTIONS	LS	1	$ 10,000.00	$ 10,000.00
4	REMOVE ASPHALT CONCRETE PAVEMENT	SQYD	340	$ 10.00	$ 3,400.00
5	REMOVE SANITARY SEWER	LNFT	6,500	$ 11.00	$ 71,500.00
6	REMOVE SANITARY MANHOLE	EACH	20	$ 900.00	$ 18,000.00
7	SCARIFY AND RECOMPACT	CUYD	50	$ 3.00	$ 150.00
8	UNCLASSIFIED EXCAVATION	CUYD	560	$ 5.00	$ 2,800.00
SURFACING					
9	6" ASPHALT PAVEMENT	TON	20	$ 185.00	$ 3,700.00
10	AGGREGATE BASE COURSE	TON	20	$ 35.00	$ 700.00
11	ENGINEERED FILL	TON	30	$ 50.00	$ 1,500.00
12	GEOTEXTILE FABRIC	SQYD	340	$ 6.00	$ 2,040.00
MISCELLANEOUS CONSTRUCTION					
13	EROSION CONTROL	LS	1	$ 10,000.00	$ 10,000.00
14	LANDSCAPING AND SEEDING	LS	1	$ 5,000.00	$ 5,000.00
15	TRAFFIC CONTROL	LS	1	$ 10,000.00	$ 10,000.00
SANITARY SEWERS					
16	8" PVC SANITARY SEWER PIPE	LNFT	5,000	$ 261.00	$ 1,305,000.00
17	8" SANITARY SEWER PIPE BEDDING MATERIAL	LNFT	5,000	$ 10.00	$ 50,000.00
18	12" PVC SANITARY SEWER PIPE	LNFT	1,500	$ 270.00	$ 405,000.00
19	12" SANITARY SEWER PIPE BEDDING MATERIAL	LNFT	1,500	$ 11.00	$ 16,500.00
20	48" MANHOLE	LS	13	$ 5,500.00	$ 71,500.00
21	MANHOLE FRAME AND COVER	EACH	13	$ 1,220.00	$ 15,860.00
22	MANHOLE EXFILTRATION TEST	EACH	13	$ 450.00	$ 5,850.00
23	PVC SEWER PIPE DEFLECTION TEST	LNFT	6,500	$ 1.00	$ 6,500.00
24	SANITARY SEWER EXFILTRATION TESTING	LNFT	6,500	$ 2.00	$ 13,000.00
25	RECONNECT SEWER SERVICE	EACH	20	$ 900.00	$ 18,000.00
26	SEWER WYE/TAP	EACH	20	$ 350.00	$ 7,000.00
27	SANITARY SEWER TEMPORARY BYPASS	EACH	1	$ 100,000.00	$ 100,000.00
				PRELIMINARY CONSTRUCTION COST	$ 2,379,000.00
				CONTINGENCY (20%)	$ 475,800.00
				ESTIMATED CONSTRUCTION SUBTOTAL	$ 2,854,800.00
				ENGINEERING DESIGN & CONSTRUCTION (20%)	$ 570,960.00
				TOTAL ESTIMATED CONSTRUCTION COST	$ 3,425,760.00

EXHIBIT H: ALTERNATIVE 3 – FULL BUILD CONSTRUCTION COST ESTIMATE

EXHIBIT I: AGENCY CORRESPONDENCE

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Cascade County
Floodplain Adminisrator
325 2nd Ave North
Great Falls, MT 59401

Re: Vaughn Sanitary Sewer Improvements PER

Dear Cascade County:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

The need for the project is due to the poor condition of the 50+ year old sanitary sewer system. CCTV videos of the sewer mains show breaks, cracks, offset joints, misalignment, sagging, and root intrusions throughout the system. Potential improvements to the sanitary sewer system include:

- Replace vitrified clay pipe sewer mains with PVC pipe.
- Replace the PVC pipe in irrigation ditch which is above ground.
- Reline manholes.

These potential areas for improvement are identified on the attached map.

We are contacting your agency to identify any potential environmental impacts associated with the planned project. Please review the proposed improvements and provide a written response detailing the presence, or absence, of any potential environmental impacts. If I have not received comments from your agency within 20 days, I will assume you have no concerns at this time regarding the proposed improvements. Please provide a written response to evelyn.dalldorf@kljeng.com or to the address in the letterhead. Please contact me at 605-872-5026 if you have any questions regarding this project.

Sincerely,

Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Montana Department of Commerce, Census and Economic Information Center
301 S. Park Ave
PO Box 200505
Helena, MT 59620-0505

Re: Vaughn Sanitary Sewer Improvements PER

Dear Montana Department of Commerce, Census and Economic Information Center:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Montana Department of Environmental Quality
Permitting and Compliance Division
1520 East 6th Ave
PO Box 200901
Helena, MT 59620-0901

Re: Vaughn Sanitary Sewer Improvements PER

Dear Montana Department of Environmental Quality:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Montana Department of Labor and Industry
1327 Lockey, PO Box 1728
Helena, MT 59624

Re: Vaughn Sanitary Sewer Improvements PER

Dear Montana Department of Labor and Industry:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Montana Department of Natural Resources and Conservation
1625 11th Ave
PO Box 201601
Helena, MT 59620-1601

Re: Vaughn Sanitary Sewer Improvements PER

Dear Montana Department of Natural Resources and Conservation:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Montana Department of Transportation
2701 Prospect Ave
PO Box 201001
Helena, MT 59620

Re: Vaughn Sanitary Sewer Improvements PER

Dear Montana Department of Transportation:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Montana Fish, Wildlife & Parks
1420 East Sixth Avenue
PO Box 200701
Helena, Mt 59620-0701

Re: Vaughn Sanitary Sewer Improvements PER

Dear Montana Fish, Wildlife & Parks:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Sincerely,

Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Montana State Historic Preservation Office
1410 8th Ave
PO Box 201202
Helena, MT 59620

Re: Vaughn Sanitary Sewer Improvements PER

Dear Montana State Historic Preservation Office:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

U.S. Army Corps of Engineers
Helena Office
100 Neill Avenue
Helena, MT 59601-3329

Re: Vaughn Sanitary Sewer Improvements PER

Dear U.S. Army Corps of Engineers:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

The need for the project is due to the poor condition of the 50+ year old sanitary sewer system. CCTV videos of the sewer mains show breaks, cracks, offset joints, misalignment, sagging, and root intrusions throughout the system. Potential improvements to the sanitary sewer system include:

- Replace vitrified clay pipe sewer mains with PVC pipe.
- Replace the PVC pipe in irrigation ditch which is above ground.
- Reline manholes.

These potential areas for improvement are identified on the attached map.

We are contacting your agency to identify any potential environmental impacts associated with the planned project. Please review the proposed improvements and provide a written response detailing the presence, or absence, of any potential environmental impacts. If I have not received comments from your agency within 20 days, I will assume you have no concerns at this time regarding the proposed improvements. Please provide a written response to evelyn.dalldorf@kljeng.com or to the address in the letterhead. Please contact me at 605-872-5026 if you have any questions regarding this project.

Sincerely,

Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

U.S. Bureau of Land Management
5001 Southgate Dr
Billings, MT 59101

Re: Vaughn Sanitary Sewer Improvements PER

Dear U.S. Bureau of Land Management:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

The need for the project is due to the poor condition of the 50+ year old sanitary sewer system. CCTV videos of the sewer mains show breaks, cracks, offset joints, misalignment, sagging, and root intrusions throughout the system. Potential improvements to the sanitary sewer system include:

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Sincerely,

Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

U.S. Department of Transportation
585 Shephard Way
Helena MT 59601

Re: Vaughn Sanitary Sewer Improvements PER

Dear U.S. Department of Transportation:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

U.S. Environmental Protection Agency
Montana Office
Federal Building, 10 West 15th Street
Suite 3200
Helena, MT 59625

Re: Vaughn Sanitary Sewer Improvements PER

Dear U.S. Environmental Protection Agency:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

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Sincerely,

Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

U.S. Fish & Wildlife Service
Helena Field Office
585 Shephard Way
Suite 1
Helena, MT 59601-6287

Re: Vaughn Sanitary Sewer Improvements PER

Dear U.S. Fish & Wildlife Service:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

The need for the project is due to the poor condition of the 50+ year old sanitary sewer system. CCTV videos of the sewer mains show breaks, cracks, offset joints, misalignment, sagging, and root intrusions throughout the system. Potential improvements to the sanitary sewer system include:

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Sincerely,

Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

U.S. Natural Resource Conservation Service
10 E. Babcock St
Bozeman, MT 59771

Re: Vaughn Sanitary Sewer Improvements PER

Dear U.S. Natural Resource Conservation Service:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

The need for the project is due to the poor condition of the 50+ year old sanitary sewer system. CCTV videos of the sewer mains show breaks, cracks, offset joints, misalignment, sagging, and root intrusions throughout the system. Potential improvements to the sanitary sewer system include:

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Sincerely,

Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

18 East Main Street, Suite 229
Rapid City, SD 57701-2949
KLJENG.COM

July 24, 2024

Little Shell Tribe of Chippewa Indians
Tribal Historic Preservation Officers
511 Central Ave West
Great Falls, MT 50404

Re: Vaughn Sanitary Sewer Improvements PER

Dear Little Shell Tribe of Chippewa Indians:

KLJ Engineering is preparing a Preliminary Engineering Report (PER) for sanitary sewer improvements for the Vaughn Cascade County Water and Sewer District. Vaughn is a census-designated place (CDP), located on Highway 89 and I-15, approximately 12 miles northwest of Great Falls, Montana.

The need for the project is due to the poor condition of the 50+ year old sanitary sewer system. CCTV videos of the sewer mains show breaks, cracks, offset joints, misalignment, sagging, and root intrusions throughout the system. Potential improvements to the sanitary sewer system include:

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Sincerely,

Evelyn Dalldorf
Environmental Engineer, KLJ Engineering
Enclosures: Project Map
Project #: 2415-00580

Evelyn Dalldorf

From: Poore, Gary M. <gmpoore@cascadecountymt.gov>
Sent: Tuesday, July 30, 2024 4:26 PM
To: Evelyn Dalldorf
Subject: FW: Vaughn Sanitary Sewer Improvements Map

Evelyn,

It looks like we will need a Special Use Permit (SUP) application for the (Utility Installation, Minor) or repairs and replacement of the Vaughn septic/sewer lines. The SUP applications fee is $500.00 and can be located at the following link: Form Center • Submit Form(s) Online (cascadecountymt.gov)

Gary M. Poore
Interim Director, Code Compliance Officer, CFM
Cascade County Planning & GIS Department
121 4th St. N, STE 2H/I
Great Falls, MT 59401
406-454-6905
gmpoore@cascadecountymt.gov

From: Poore, Gary M.
Sent: Tuesday, July 30, 2024 2:20 PM
To: Evelyn Dalldorf <Evelyn.Dalldorf@kljeng.com>
Cc: Leavens, Raina <rleavens@cascadecountymt.gov>
Subject: RE: Vaughn Sanitary Sewer Improvements Map

Evelyn,

Perfect … I'll check to see if we need any zoning permits and get back with you.

Gary M. Poore
Interim Director, Code Compliance Officer, CFM
Cascade County Planning & GIS Department
121 4th St. N, STE 2H/I
Great Falls, MT 59401
406-454-6905
gmpoore@cascadecountymt.gov

From: Evelyn Dalldorf <Evelyn.Dalldorf@kljeng.com>
Sent: Tuesday, July 30, 2024 1:33 PM
To: Poore, Gary M. <gmpoore@cascadecountymt.gov>
Subject: RE: Vaughn Sanitary Sewer Improvements Map

Gary,

To clarify, the project will only involve replacing the 6" VCP, 8" VCP, and 12" VCP gravity sewer mains which are colored red and purple on the map, as well as potentially replacing the 10" PVC pipe in the irrigation ditch (#31A to #32). This project will not involve replacing the 10" PVC pipe at the corner of 1st Ave North and 4th St. (#30).

Thanks

Evelyn Dalldorf
KLJ – Rapid City
605-872-5026 Direct

From: Poore, Gary M. <gmpoore@cascadecountymt.gov>
Sent: Tuesday, July 30, 2024 12:59 PM
To: Evelyn Dalldorf <Evelyn.Dalldorf@kljeng.com>
Subject: RE: Vaughn Sanitary Sewer Improvements Map

Evelyn,

In response to your request for our assessment of the environmental impact of your project to replace the existing Vaughn MT. sanitary sewer lines. After looking over your proposed project (Figure 5.1 Great West Existing Collection System TV Inspection Plan), the Planning & GIS Department identified a potential requirement for a Floodplain Permit Application based upon the replacement of the 10-inch PVC Pipe located at the corner of 1st Ave North and 4th St. (#30). The location of the site indicates the installation of a 10-inch pipe may require an "alteration" to the Vaughn Levee. Any alteration to the Vaughn Levee would require a Floodplain permit issued by the Cascade County Planning & GIS Department . Please refer to the Cascade County Floodplain Regulations link: Floodplain-Regulations-PDF (cascadecountymt.gov) Section 8 **DEVELOPMENT REQUIREMENTS - FLOODWAY** and Section 8.13.1 **Levee & Floodwall** construction or alteration, prior to "any" alteration to the levee.

Please submit a Floodplain Permit Application to our office or verify the location of the pipeline will not impact the Levee prior to construction.

The Planning & GIS Department does not address any other environmental considerations, or State, and Federal laws pertaining to your project.

Best wishes,

Gary M. Poore
Interim Director, Code Compliance Officer, CFM
Cascade County Planning & GIS Department
121 4th St. N, STE 2H/I
Great Falls, MT 59401

406-454-6905
gmpoore@cascadecountymt.gov

From: Evelyn Dalldorf <Evelyn.Dalldorf@kljeng.com>
Sent: Tuesday, July 30, 2024 10:20 AM
To: Poore, Gary M. <gmpoore@cascadecountymt.gov>
Subject: Vaughn Sanitary Sewer Improvements Map

As discussed on the phone, attached is the project map for the Vaughn sanitary sewer improvements. The project will involve replacing the vitrified clay pipe sewer mains and relining manholes. Let me know if you have any questions.

Thanks

Evelyn Dalldorf
KLJ
605-872-5026 Direct
18 East Main Street, Suite 229
Rapid City, SD 57701-2949
kljeng.com

Messages and attachments sent to or from this e-mail account may be considered public or private records depending on the message content. Unless otherwise exempted from the public records law, senders and receivers of County email should presume that the emails are subject to release upon request. This message is intended for the use of the individual or entity named above. If you are not the intended recipient of this transmission, please notify the sender immediately, do not forward the message to anyone, and delete all copies.
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Evelyn Dalldorf

From: Gernand, Candice <Candice.Gernand@mt.gov>
Sent: Wednesday, July 31, 2024 9:17 AM
To: Evelyn Dalldorf
Cc: Kuhl, Jackie; Abrahamson, Michael
Subject: Comment: Vaughn Sanitary Sewer Improvements PER
Attachments: Vaughn Sanitary Sewer Improvments PER_CmntLtr_31Jul2024.pdf

Thank you for reaching out to Montana Department of Environmental Quality.

Attached is a letter of response for the subject: Vaughn Sanitary Sewer Improvements PER.

Thank you,

Candice Gernand | Data Control Specialist
SRF Engineering | Engineering Bureau
Montana Department of Environmental Quality
Office: 406-444-4643

DEQ Montana Department of Environmental Quality

How did we do? »

DEQ
Montana Department
of Environmental Quality

July 31, 2024

Evelyn Dalldorf, PE
KLJ Engineering
18 East Main Street, Suite 229
Rapid City, SD 57701-2949

Re: Request for Comments on the Vaughn Sanitary Sewer Improvements PER

Dear Ms. Dalldorf:

Thank you for the request for comments on the above referenced proposed project.

Since the Department of Environmental Quality (DEQ) will be reviewing environmental documents, the preliminary engineering report, and plans and specifications for the proposed project when they are submitted; those reviews will serve as DEQ's comments. The reviews will be performed by either the Public Water Supply Program, or if DEQ funding is also proposed, the Water Pollution Control State Revolving Fund Program (SRF). Both of these programs are in DEQ's Engineering Bureau. Please keep in mind that other DEQ permits associated with construction of the project may be required.

If you have any questions regarding DEQ's participation, please contact Mike Abrahamson in the Water Pollution Control State Revolving Fund Program at mabrahamson@mt.gov, or me at (406) 444-1515 or jackie.kuhl@mt.gov.

Sincerely,

Jackie Kuhl, P.E.
PWS Plan & Specification Section Supervisor
DEQ- Engineering Bureau

Cc: Mike Abrahamson, PE, WPCSRF

Evelyn Dalldorf

From: Murdo, Damon <dmurdo@mt.gov>
Sent: Wednesday, July 31, 2024 8:51 AM
To: Evelyn Dalldorf
Subject: VAUGHN SANITARY SEWER IMPROVEMENTS PER
Attachments: Reports.pdf; Sites.pdf; 20240730007.pdf

MONTANA HISTORICAL SOCIETY
State Historic Preservation Office

July 31, 2024

Evelyn Dalldorf
KLJ
18 E Main St, Suite 229
Rapid City SD 59701-2949

RE: VAUGHN SANITARY SEWER IMPROVEMENTS PER. SHPO Project #: 20240730007

Dear Evelyn:

I have conducted a cultural resource file search for the above-cited project located in Sections 24, 25, T21N R1E. According to our records there have been a few previously recorded sites within the designated search locales. None of these sites are located within your proposed project area. In addition to the sites there have been a few previously conducted cultural resource inventories done in the areas. I've attached a list of these sites and reports. If you would like any further information regarding these sites or reports, you may contact me at the number listed below.

It is SHPO's position that any structure over fifty years of age is considered historic and is potentially eligible for listing on the National Register of Historic Places. If any structures are within the Area of Potential Effect, and are over fifty years old, we would recommend that they be recorded, and a determination of their eligibility be made prior to any disturbance taking place.

As long as there will be no disturbance or alteration to structures over fifty years of age and the project will be kept within previously disturbed ground, we feel that there will be no cultural or historic properties affected by this undertaking. We, therefore, feel that a recommendation for a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or if cultural materials are inadvertently discovered during this project, we would ask that our office be contacted, and the site investigated.

The MT SHPO is going paperless!! For all future file search and consultations with the MT SHPO please use the new Montana Cultural Resource Database to upload your projects. You can find instructions for how to upload your documents on our website. https://mhs.mt.gov/Shpo/docs/download/crd-submitting-db2.pdf

If you have any further questions or comments, you may contact me at (406) 444-7767 or by e-mail at dmurdo@mt.gov. I have attached an invoice for the file search. Thank you for consulting with us.

Sincerely,

Damon Murdo

Cultural Records Manager
State Historic Preservation Office

File: DEQ/AWWM/2024

MONTANA
HISTORICAL SOCIETY
State Historic
Preservation Office

FILE SEARCH REQUEST INVOICE

DATE: 31-Jul-24

SHPO Invoice #: 20240730007

Bill To:
Contact Name: Evelyn Dalldorf
Organization: KLJ
Address: 18 E Main St, Suite 229
City/State/Zip: Rapid City SD 59701-2949

File Search Fee Structure
$35 / Section Searched
For questions contact: **Damon Murdo** dmurdo@mt.gov **406-444-7767**

Total Cost:	**$70.00**

Project Name:	VAUGHN SANITARY SEWER IMPROVEMENTS PER

Total sections searched for SHPO Project #: 20240730007	**2**

Please make all checks payable to:
Montana Historical Society
PO Box 201201
Helena, MT 59620

**** PAY ONLINE HERE ****
https://svc.mt.gov/doa/opp/HISSHPO/cart

Due upon receipt. Please pay within 30 days.

MTHS Accounting Use Only	604 59.50	604.1 10.50

STATE HISTORIC PRESERVATION OFFICE
Montana Cultural Resource Database
Report Township,Range,Section Results
Report Date:7/31/2024

Township:21 N Range:1 E Section: 24

JOHNSON LON, ET AL.

6/30/1993 VAUGHN-SUN RIVER HIGHWAY PROJECT, MONTANA HIGHWAY 89, CASCADE COUNTY, MONTANA

Report Document Number: CA 4 15283 Agency Document Number: F 3-1(9)0

Township:21 N Range:1 E Section: 24

JOHNSON LON, ET AL.

6/30/1993 VAUGHN-SUN RIVER HIGHWAY PROJECT, MONTANA HIGHWAY 89, CASCADE COUNTY, MONTANA

Report Document Number: CA 4 15283 Agency Document Number: F 3-1(9)0

Township:21 N Range:1 E Section: 24

RENNIE PATRICK J.

9/1/1993 BIG MUDDY CREEK DRAINAGE

Report Document Number: CA 6 15602 Agency Document Number: SR-93-69

Township:21 N Range:1 E Section: 24

WOOD GARVEY C.

11/14/2000 MUDDY CREEK BORROW SOURCE

Report Document Number: CA 4 23253 Agency Document Number:

STATE HISTORIC PRESERVATION OFFICE Montana Cultural Resource Database

Township, Range, Section Report

Report Date:7/31/2024

Site #	Twp	Rng	Sec	Qs	Site Type 1	Site Type 2	Time Period	Owner	NR Status
24CA0230	21N	1E	25	NW	Historic Agriculture		1860-1869	Private	NR Listed
24CA0264	21N	1E	24	Comb	Historic Railroad		1900-1909	MDOT Other	Eligible
24CA0374	21N	1E	24	SW	Historic Railroad Building/Structure		1910-1919	Private	Ineligible
24CA0375	21N	1E	24	SE	Historic School		1930-1939	Private	Eligible
24CA0386	21N	1E	24	Comb	Historic District		Historic More Than One Decade	MDOT	NR Listed
24CA0625	21N	1E	24	NW	Historic Irrigation System		Historic More Than One Decade	Private	Eligible
24CA0371	21N	1E	24	comb	Historic Railroad		Historic More Than One Decade	Combination	Eligible
24CA1796	21N	1E	24	Comb	Historic Road		Historic More Than One Decade	Combination	Undetermined*
24CA1859	21N	1E	24	Comb	Historic Road		Historic More Than One Decade	Combination	Eligible

EXHIBIT J: COMMUNITY ENGAGEMENT

EXHIBIT K: UNIFORM ENVIRONMENTAL CHECKLIST

Environmental Checklist Instructions

Purpose of This Document:
All applicants must consider the potential environmental impacts of their projects. Consideration of these impacts on the location, design, or construction actions may help avoid expensive costs. A project will not be eligible for funding if it results in significant environmental degradation.

DNRC requires compliance with the Montana Environmental Policy Act (MEPA) per state law and associated DNRC Administrative Rules (ARM 36.2.523). MEPA requires state agencies to prepare a detailed statement on any project, program, or activity directly undertaken by the agency; a project or activity supported through a contract, grant, subsidy, loan, or other form of funding assistance from the agency; and a project or activity involving the issuance of a lease, permit, license, certificate, or other entitlement for use or permission by the agency (MCA Title 75, Chapter 1). Thus, all project applications will be subject to MEPA review.

What Does This Mean for Applicants?

- All applicants must complete the Environmental Checklist in its entirety and provide sufficient documentation on public participation.
- Public participation, or scoping, of the project must include stakeholder, landowner, and community engagement. These efforts can be in the form of documented public meetings (e.g., meeting minutes, pdf presentations) or letters of support.
    - The public meeting must be properly noticed (advertised) and the public must be provided with an opportunity at the meeting to comment on the project.
    - Minutes of the meeting should reflect what was discussed about the project, including all comments received from the public.
    - Letters of support must be included from any identified or interested stakeholders.
- Please submit these items with your application.

How Will DNRC Use the Information Provided?

The information provided within the Environmental Checklist will be subject to a MEPA review by DNRC. If this review should result in an Environmental Assessment, please be aware that DNRC will draft the Environmental Assessment. The drafted Environmental Assessment decision will be posted for a public comment period of either two weeks or 30 days dependent on the level of environmental impact. Please note this public comment period does not suffice for the public participation component mentioned above. The MEPA document will then require a final decision by DNRC before funds are awarded.

It is also important to note for projects with no environmental impacts, or those that do not lead directly to construction or any other sort of environmental degradation, will not be subject to an environmental assessment and the checklist/public participation does not need to be completed. Examples of these sorts of activities include, but are not limited to, development of a PER (professional engineering report), planning, and education/informational outreach. Please let us know if there are additional questions on what other projects may fall under this category.

Instructions:

Complete the Environmental Checklist on the following pages after the instructions below. DNRC retains the ultimate decision-making authority on all MEPA decisions. If DNRC determines this section to be incomplete, additional information will be required before consideration for funding.

Example			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**
1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☐ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	*Current Conditions:* *Preferred Alternative Environmental Narrative:*

1. **Impact Code:** In the first column, identify the impact that the preferred alternative will have on each resource (e.g. 1. Soil Suitability, Topographic and/or Geologic Constraints) in the project area. Select from the following impact codes:
   - *No Impact*: No impact to the resource is anticipated or this is not applicable to this project.
   - *Beneficial*: Potentially beneficial impact to the resource.
   - *Adverse*: Potentially adverse impact to the resource.

   Please note that a resource may have more than one impact. Identify all possible impacts to the resource in the space provided. For example, the preferred alternative may have a short-term direct negative impact and a long-term direct and indirect positive impact on the resource. Check all boxes that apply and use the space provided in the final column "Explanation of Impact to Resource" to explain.

Example			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**
1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☐ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	*Current Conditions:* *Preferred Alternative Environmental Narrative:*

2. **Impact Type:** In the second column, identify the type(s) of impact to the resource from the preferred alternative. (Impacts may be direct, indirect or cumulative).
   - *Direct impacts*: Occur at the same time and place as the proposed project.
   - *Indirect or secondary impacts*: Occur at a different location or later time than the proposed project.
   - *Cumulative impacts*: Collective impacts on the environment when considered in conjunction with other past, present, and future actions related to the proposed

project. Cumulative impact analysis includes a review of all state and nonstate activities that have occurred, are occurring, or may occur that have impacted or may impact the same resource as the proposed project.

Just as above, please note that a resource may have more than one impact. Identify all possible impacts to the resource in the space provided. For example, the preferred alternative may have a short-term direct negative impact and a long-term direct and indirect positive impact on the resource. Check all boxes that apply and use the space provided in the final column "Explanation of Impact to Resource" to explain.

Example			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**
1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☐ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	*Current Conditions:* *Preferred Alternative Environmental Narrative:*

3. **Permits/Mitigation Required:** In the third column, please select if a permit and/or mitigation is required for the project (e.g., 310, USACE Section 404 Nationwide).
    - Please make sure to include which permits (if any) are required for the particular resource and what mitigation techniques will be used if impacts are to occur.

Example			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**
1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☐ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	*Current Conditions:* Click or tap here to enter text. *Preferred Alternative Environmental Narrative:* Click or tap here to enter text.

4. **Explanation of Impact to Resource:** In the final column, use the space provided on the Environmental Checklist to summarize the following information:
    - ***Current Conditions***
        - Describe the <u>current</u> environmental resources of the affected area including the impact of no action. Your description of the current natural resources will provide a baseline to compare all alternatives and their associated environmental impacts.
    - ***Preferred Alternative Environmental Narrative:***
        - Describe the impact of the preferred alternative or ***indicate why there is <u>no impact</u>*** from the project.
        - Identify any reasonable cumulative impacts that may result from implementing the preferred alternative. Cumulative impacts are the collective impacts on the

environment when considered in conjunction with other past, present, and future actions related to the proposed project.

- If a potentially adverse impact is identified for the preferred alternative, the applicant must provide the following:
    - An analysis of the severity, duration, extent, and frequency of the impact. Please specify and describe the following:
        - Severity: negligible, minor, or major.
        - Duration: short-term or long-term.
        - Extent: local, regional, or statewide.
        - Frequency: non-recurring or recurring.
    - An explanation of short- and/or long-term measures to mitigate the impact with a discussion on the effects of those mitigative measures on the proposed project.
- Identify any required permits.

5. **Additional Information:** Underneath the table the following information must be provided:
    - Cultural Survey Acknowledgement
    - Sources of Information: Identify all sources consulted for the completion of the Environmental Checklist. Sources may include studies, plans, documents, or the persons, organizations, or agencies contacted for assistance.

Certain sections of this Environmental Checklist may require specialized knowledge. Please contact the following agencies and attach comments provided by those agencies to your application. Below are contacts for certain sections that may require additional review by other agencies:

- *Physical Environment,* ***Section #5*** **– Surface Water Quality** – Montana Department of Environmental Quality, (406) 444 - 3080.
- *Physical Environment,* ***Section #6*** **– Floodplains and Floodplain Management** – Contact the Local Floodplain Administrator for your County and/or Community (http://dnrc.mt.gov/divisions/water/operations/floodplain-management/contacts/20210924FPAs2021.1.pdf) or visit the Department of Natural Resources Water Resources Division, (406) 444 – 0860, http://dnrc.mt.gov/divisions/water/operations/floodplain-management.
- *Physical Environment,* ***Section #7*** **– Wetlands** – U.S. Department of the Army Corps of Engineers, (406) 441 - 1375 or montana.reg@usace.army.mil.
- *Physical Environment,* ***Section #9*** **– Vegetation and Wildlife Species and Habitats** – Montana Fish, Wildlife and Parks, Wildlife Office (406) 444 - 2612 or find your Regional Office at https://fwp.mt.gov/aboutfwp/contact-us.
- *Physical Environment,* ***Section #10*** **– Unique, Endangered, Fragile or Limited Environmental Resources** – U.S. Fish and Wildlife Service for consultation on potential impacts to endangered or limited plants, fish, or other wildlife, (406) 449 - 5225.
- *Human Environment,* ***Section #4*** **– Historic Properties, Cultural or Archaeological Resources –** Montana State Historic Preservation Office (SHPO), (406) 444 - 7767 or dmurdo@mt.gov.

For assistance in preparing the Environmental Checklist, contact DNRC grant manager listed on grant application.

Environmental Checklist

Environmental Checklist Prepared by: On: Click or tap to enter a date.

Evelyn Dalldorf	KLJ Engineering
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Click or tap here to enter text.
List additional people above. Include organization, phone number and email for all.

Physical Environment			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**
1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The NRCS Soil Survey Map is attached to this report. Preferred Alternative Environmental Narrative: Soils are generally stable and conducive to excavation and construction. Topography within the project area is suitable for pipe and structure construction. No soil slumps or subsidence have been identified in the project area.
2. Hazardous Facilities (example: power lines, hazardous waste sites, acceptable distance from explosive and flammable hazards including chemical/petrochemical storage tanks, underground fuel storage tanks, and related facilities such as natural gas storage facilities and propane storage tanks)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are 9 active underground storage tanks in the city of Vaughn, according to Montana DEQ. Five of the tanks are located near the Sinclair Gas Station at 133 US-89 (Latitude 47.556908°, Longitude -111.551087°), and the other four tanks are located near the Glacier Gateway Conoco gas station at 99 US-89 (Latitude 47.558477°, Longitude -111.544212°). Preferred Alternative Environmental Narrative: The underground storage tanks are outside of the project area for this project. The project area is in the northeast side and southwest side of town in residential areas, and does not

			intersect with US-89. The underground storage tanks are not within the project area.
3. Surrounding Air Quality (example: dust, odors, emissions)			
☐ No Impact ☐ Beneficial ☒ Adverse	☒ Direct ☒ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☐ NA	Current Conditions: Based on the US EPA National Ambient Air Quality Standards, Vaughn does not exceed any criteria air pollutants. Preferred Alternative Environmental Narrative: There will be temporary dust generated from the construction of the project that will be minimized with BMP's. There are no anticipated long-term effects on surrounding air quality or any kind of effects of existing air quality.
4. Groundwater Resources and Aquifers (example: quantity, quality, distribution, depth to groundwater, sole source aquifers)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Ground water is present at about 130 feet below the surface. Preferred Alternative Environmental Narrative: Replacing sanitary sewer lines will involve shallow excavations, which will be above the ground water level. No impacts to ground water are anticipated from this project.
5. Surface Water/Water Quality, Quantity and Distribution (example: streams, lakes, storm runoff, irrigation systems, canals)			
☐ No Impact ☒ Beneficial ☒ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☒Permit ☐Mitigation ☐ NA	Current Conditions: In the northeast side of town, the Sun River Valley Ditch connects to Muddy Creek. Muddy Creek travels about 2 miles to the Sun River. In the southwest side of town, an unnamed tributary travels approximately 1.5 miles to the Sun River. Preferred Alternative Environmental Narrative: Muddy Creek in the northeast side of town is approxmately 800 feet northeast of the project area. The unnamed tributary in the southwest side of town is approximately 800 feet south of the project area. In the short term, there may be a very minor increase in sediment transport associated with construction activities for this project. Best management practices will be implemented to minimize the potential for erosion and sedimentation from construction activities. No long-term detrimental effects to surface water are anticipacted. The Montana DEQ requires coverage under the Construction Stormwater General Permit (Permit No. MTR100000) if a construction project disturbs 1 acre of land or more. Comments from the Montana DEQ been requested and included as part of the PER. In the long term, this project will improve the lifespan of the sanitary sewer collection system, reduce infiltration and inflow, reduce the occurrence of sanitary sewer overflows, and improve the capacity of the wastewater treatment facility.

6. Floodplains and Floodplain Management (Identify any floodplains within one mile of the boundary of the project.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The project area is outside of the 100-year floodplain. The area is protected by a provisionally accredited levee. Preferred Alternative Environmental Narrative: The project area does not intersect with the provisionally accredited levee. No impacts to the levee are anticipated from this project.
7. Wetlands (Identify any wetlands within one mile of the boundary of the project and state potential impacts.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Muddy Creek is classified by the National Wetlands inventory as a freshwater emergent wetland, freshwater forested/shrub wetland, and riverine. The Sun River is classified by the National Wetlands inventory as a forested/shrub wetland and riverine. The unnamed tributary is classified by the National Wetlands inventory as a forested/shrub wetland and freshwater pond. Preferred Alternative Environmental Narrative: There are no anticipated impacts to the wetlands. The project area does not intersect with the wetlands, and is confined to previously disturbed areas.
8. Agricultural Lands, Production, and Farmland Protection (example: grazing, forestry, cropland, prime or unique agricultural lands) Identify any prime or important farm ground or forest lands within one mile of the boundary of the project.			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: There are some soils in the project boundaries which are considered prime farmland if irrigated. There are some soils outside the town which are considered farmland of state importance. Preferred Alternative Environmental Narrative: Although some soils within the town are considered prime farmland if irrigated, the proposed work will be located in existing disturbed areas. The proposed project is not anticipated to change the existing land use. The farmlands of state importance are outside the project boundaries and are not anticipated to be affected.

9. Vegetation and Wildlife Species and Habitats, Including Fish (example: terrestrial, avian and aquatic life and habitats)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Fauna of the area consists of typical mammalian species found in the intermountain west, including mule deer, whitetail deer, antelope, coyote, rabbit, skunk, weasel, rodents, and others. Common bird species include the black-billed magpie, American robin, Canadian goose, sparrow, warbler, common waterfowl, other raptors, game birds, and others. According to Montana Natural Heritage Program database, species of concern in the area include the: Ferruginous Hawk (Buteo regalis), Franklin's Gull (Leucophaeus pipixcan), Golden Eagle (Aquila chrysaetos), Great Blue Heron (Ardea herodias), Long-billed Curlew (Numenius americanus), Sharp-tailed Grouse (Tympanuchus phasianellus), and Northern Leopard Frog (Lithobates pipiens). The project area does not fall within the general habitat for greater sage grouse, as defined by the Montana Sage Grouse Habitat map, which depicts the areas that fall under the Executive Order. Preferred Alternative Environmental Narrative: There are no anticipated impacts to vegetation and wildlife species and habitats. The project area does not intersect with any wetlands, and is confined to previously disturbed areas.
10. Unique, Endangered, Fragile, or Limited Environmental Resources, Including Endangered Species (example: plants, fish or wildlife)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: According to US Fish and Wildlife Service IPaC species list report, there are no endangered species near Vaughn. There is one mammal classified as threatened, the Grizzly Bear (Ursus arctos horribilis), and there is one insect classified as a candidate species, the Monarch Butterfly (Danaus Plexippus). Preferred Alternative Environmental Narrative: There are no anticipated impacts to unique, endangered, fragile, or limited environmental resources, including endangered species. The project area does not intersect with any wetlands, and is confined to previously disturbed areas.
11. Unique Natural Features (example: geologic features)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are no unique natural features located in the vicinity of the proposed project. Preferred Alternative Environmental Narrative: There will be no impacts to unique natural features since there are none in the vicinity of the proposed project.

12. Access to, and Quality of, Recreational and Wilderness Activities, Public Lands and Waterways (including Federally Designated Wild & Scenic Rivers), and Public Open Space			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are no anticipated impacts to recreational and wilderness activites, public lands and waterways, or public open space. The project area is limited to local roads and residential areas. Preferred Alternative Environmental Narrative: There are no anticipated impacts to recreational and wilderness activites, public lands and waterways, or public open space. The project area is limited to local roads and residential areas.
Human Environment			
Impact Code	**Impact Type**	**Resource**	
1. Visual Quality – Coherence, Diversity, Compatibility of Use and Scale, Aesthetics			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The proposed work will be located in existing disturbed areas. Preferred Alternative Environmental Narrative: Allthough there may be some slight aesthetics concerns during construction, this will all be temporary and will not affect the visual quality in any adverse way.
2. Nuisances (example: glare, fumes)			
☐ No Impact ☐ Beneficial ☒ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☐ NA	Current Conditions: Vaughn is a smaller community and there are currently not any notable nuisances Preferred Alternative Environmental Narrative: Mitigation would be required in the short term during project construction. The proposed project many cause temporary nuisances such as noise and exhaust fumes from construction equipment, traffic detours while sections beneath roadways are under construction. Efforts will be made to minimize nuisances including detours and select timing of construction work in residental areas.
3. Noise – Suitable Separation Between Housing and Other Noise Sensitive Activities and Major Noise Sources (example: aircraft, highways and railroads.)			
☐ No Impact ☐ Beneficial ☒ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☐ NA	Current Conditions: Currently there are no notable sound pollution within the Town of Big Sandy besides the highway and railroad. Preferred Alternative Environmental Narrative: There may be some temporary noise associated with the project construction activities. No other long term impacts to the existing noise levels in the vicinity of the project are anticipated.

4. Historic Properties, Cultural, and Archaeological Resources ***(Please see end of Environmental Checklist for details if Cultural Survey has not been performed per SHPO Section 106)***			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The Montana SHPO was contacted and stated, "as long as there will be no disturbance or alteration to structures over fifty years of age and the project will be kept within previously disturbed ground, we feel that there will be no cultural or historic properties affected by this undertaking." Preferred Alternative Environmental Narrative: The proposed project will not impact any historic properties, cultural, or archaeological resources.
5. Changes in Demographic (Population) Characteristics (example: quantity, distribution, density)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. The population was 737 according to the 2020 Census. Preferred Alternative Environmental Narrative: The proposed project will not impact changes in demographic characteristics.
6. General Housing Conditions – Quality, Quantity, Affordability			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. In 2020, there were 316 housing units, with 283 occupied and 33 vacant. (US Census) Preferred Alternative Environmental Narrative: The proposed project will not impact housing quality, quantity, or affordability.
7. Businesses or Residents (example: loss of, displacement, or relocation)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: The proposed project will not displace or relocate any businesses or residents.
8. Public Health and Safety			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: There are no anticipated impacts to public health and safety due to the proposed project.
9. Local Employment – Quantity or Distribution of Employment, Economic Impact			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. In 2022, the employment rate was 58.5%. (US Census) Preferred Alternative Environmental Narrative: There are no anticipated impacts to local employment or income patterns due to the proposed project.

10. Income Patterns – Economic Impact			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. In 2022, the median household income was $45,000, with 12.1% of the town in poverty (US Census). Preferred Alternative Environmental Narrative: There are no anticipated impacts to local employment or income patterns due to the proposed project.
11. Local and State Tax Base and Revenues			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: In 2022, the median household income of Vaughn was $45,000, with 12.1% of the population in poverty according to US Census. Preferred Alternative Environmental Narrative: There are no anticipated impacts to local and state tax base and revenues.
12. Community and Government Services and Facilities (example: educational facilities; health and medical services and facilities; police; emergency medical services; and parks, playgrounds and open space)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: There are no anticipated impacts to community and government services and facilities.
13. Commercial and Industrial Facilities – Production and Activity, Growth or Decline			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: There is no anticipated impact to the commercial or industrial facilities as a result of the proposed project.
14. Social Structures and Mores (example: standards of social conduct/social conventions)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: There is no anticipated impact to social structures and mores as a result of the proposed project.
15. Land Use Compatibility (example: growth, land use change, development activity, adjacent land uses and potential conflicts)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: According to the Montana Natural Heritage Program, the primary land uses of the Vaughn area consists of cultivated crops, great plains mixedgrass prairie, introduced upland vegetation, and other roads. Preferred Alternative Environmental Narrative: There are no anticipated impacts to land use compatibility from this project. The project area is confined to previously disturbed areas.

16. Energy Resources – Consumption and Conservation			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: There are no anticipated impacts to energy resources.
17. Solid Waste Management			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: There are no anticipated impacts to solid waste management.
18. Wastewater Treatment – Sewage System			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The sanitary sewer system consists of approximately 3,034 ft of vitrified clay pipe (VCP) gravity sewer mains, and 13,040 ft of PVC gravity sewer mains. The VCP sewer mains are over 50 years old and at the end of their expected service lives. In their current state, the sanitary sewer system poses various health, sanitation, and sustainability issues. Specifically, the VCP mains contain breaks, cracks, offset joints, misaligned pipes, sagging pipes, and root intrusions, which has caused excessive infiltration and inflow (I/I). Additionally, approximately 484 ft of VCP gravity sewer mains are 6 inches in diameter, which is undersized according to Montana Department of Environmental Quality (DEQ) design criteria. Preferred Alternative Environmental Narrative: In the long term, this project will improve the lifespan of the sanitary sewer collection system, and reduce infiltration and inflow. This will reduce the occurrence of sanitary sewer overflows, and improve the capacity of the wastewater treatment facility.
19. Storm Water – Surface Drainage			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are no anticipated impacts to storm water surface drainage. Preferred Alternative Environmental Narrative: There are no anticipated impacts to storm water surface drainage.
20. Community Water Supply			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: There are no anticipated impacts to community water supply.
21. Fire Protection – Hazards			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Vaughn has many small businesses and residents typical of a small Montana town. Preferred Alternative Environmental Narrative: There are no anticipated impacts to fire hazards.

22. Cultural Facilities, Cultural Uniqueness and Diversity			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The Montana SHPO was contacted and stated, "as long as there will be no disturbance or alteration to structures over fifty years of age and the project will be kept within previously disturbed ground, we feel that there will be no cultural or historic properties affected by this undertaking." Preferred Alternative Environmental Narrative: The proposed project will not impact any historic properties, cultural, or archaeological resources.
23. Transportation Networks and Traffic Flow Conflicts (example: rail; auto including local traffic; airport runway clear zones – avoidance of incompatible land use in airport runway clear zones)			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☐ NA	Current Conditions: Highway 89 runs through town, connecting to highway 15 to the northeast. There is also a railroad on the northeast side of town. Preferred Alternative Environmental Narrative: The project area is limited to local roads. Temporary traffic control will be necessary to replace sanitary sewer lines located in ROWs.
24. Consistency with Local Ordinances, Resolutions, or Plans (example: conformance with local comprehensive plans, zoning, or capital improvement plans.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Click or tap here to enter text. Preferred Alternative Environmental Narrative: Current Conditions: The Cascade County Growth Policy Update (2014) states, "Aging on site wastewater systems need to be replaced as needed to meet current regulations." Preferred Alternative Environmental Narrative: This project involves replacing aging sewer infrastructure. There are no anticipated impacts to local ordinances, resolutions, or plans.
25. Private Property Rights (example: a regulatory action or project activity that reduces, minimizes, or eliminates the use of private property.)			
☐ No Impact ☐ Beneficial ☒ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☒Permit ☐Mitigation ☐ NA	Current Conditions: According to Montana Cadastral, parts of the project area are on private property. Preferred Alternative Environmental Narrative: Temporary construction easements will be obtained as needed. No permanent impacts to private property rights are anticipated from this project.
26. Environmental Justice (example: does the project avoid placing lower income households in areas where environmental degradation has occurred, such as adjacent to brownfield sites?)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Results from EPA EJScreen are attached to this report. Preferred Alternative Environmental Narrative: There are no anticipated impacts to environmental justice as a result of the proposed project.

27. Lead Based Paint and/or Asbestos (example: does the project replace asbestos-lined pipes? Do any structures qualify as containing lead-based paint?)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The project does not involve any lead based paint or asbestos structures. Preferred Alternative Environmental Narrative: There are no anticipated impacts to lead based paint or asbestos.

Additional Information

****If no cultural survey has been performed, or is not expected to be needed, applicant must agree to the following statement:**

☒ I hereby agree that, to my knowledge, there are no cultural or paleontological materials in the proposed project site. If previously unknown cultural or paleontological materials are identified during project related activities, the DNRC grant manager will be notified, and all work will cease until a professional assessment of such resources can be made.

List all sources of information used to complete the Environmental Checklist. Sources may include studies, plans, documents, or the individuals, organizations, or agencies contacted for assistance. For individuals, groups, or agencies, please include a contact person and phone number. List any scoping documents or meetings and/or public meetings during project development.

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Agencies Contacted:

Cascade County
Montana Department of Commerce, Census and Economic Information Center
Montana Department of Environmental Quality
Montana Department of Labor and Industry
Montana Department of Natural Resources and Conservation
Montana Department of Transportation
Montana Fish, Wildlife & Parks
Montana State Historic Preservation Office
U.S. Army Corps of Engineers

U.S. Bureau of Land Management
U.S. Department of Transportation
U.S. Environmental Protection Agency
U.S. Fish & Wildlife Service
U.S. Natural Resource Conservation Service
Little Shell Tribe of Chippewa Indians

Below is a list of electronic resources available for data gathering to aid in the development of the Environmental Checklist:

Abandoned Mines (DEQ): https://deq.mt.gov/cleanupandrec/Programs/aml

Agricultural Statistics (USDA): USDA - National Agricultural Statistics Service - Data and Statistics

Air Quality

- Nonattainment Areas: Plan and Rule Development | Montana DEQ (mt.gov)
- Opening Burning Guidelines: Open Burning | Montana DEQ (mt.gov)

Army Corps of Engineers: http://www.usace.army.mil/Home.aspx

Bureau of Business and Economic Research, UM: http://www.bber.umt.edu/

Cadastral (for property ownership info): http://svc.mt.gov/msl/mtcadastral

Census Information, MT Dept. of Commerce: http://ceic.mt.gov

Conservation Districts, MT: http://macdnet.org/

Cultural Records

- Montana Historical Society: https://mhs.mt.gov/Shpo/CulturalRecords

DEQ data search tools: Montana DEQ's GIS Portal (mt.gov)

- Including Clean Water Act Info Center, Hazardous Waste Handlers, Petroleum Release Fund Claims, Unpermitted Releases, Underground Storage Tanks, Source Water Protection

EPA Enforcement and Compliance History Online http://echo.epa.gov/

Farmland Classification: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Fish (Also See Wildlife)

- Montana Fisheries Information System: Montana Fish, Wildlife & Parks GIS Data (arcgis.com)
- Aquatic Invasive Species: Montana FWP AIS Surveys Dashboard 2021 (arcgis.com)

Floodplain Maps, FEMA: https://msc.fema.gov/portal

Geographic Information, Natural Resources Information System: http://nris.mt.gov/gis

Geologic Information - MBMG - Publications - Download Geologic Maps (mtech.edu)

Maps of Montana for species observations, land cover, wetland and riparian areas, land management: Montana Natural Heritage Program (mtnhp.org); http://mtnhp.org/mapviewer/?t=6

Montana Department of Transportation: https://www.mdt.mt.gov/

- Environmental Manual: http://www.mdt.mt.gov/publications/docs/manuals/env/preface.pdf
- Environmental Manual - Chapter 29, Permits Required: https://www.mdt.mt.gov/publications/docs/manuals/env/Chapter%2029%20PERMITS%20REQUIRED.pdf

Montana Board of Oil and Gas Conservation Information System:

- http://bogc.dnrc.mt.gov/webApps/DataMiner/

Plants

- Plant database, USDA Natural Resources Conservation Service: http://plants.usda.gov/java
- Plant Species, MT Field Guide: http://fieldguide.mt.gov/default.aspx
- Plant Species of Concern: http://mtnhp.org/SpeciesOfConcern/Default.aspx?AorP=p
- Threatened, Endangered and Rare Plants, USDA: https://plants.usda.gov/home/raritySearch

Soils

- USDA Natural Resource Conservation Service database: https://websoilsurvey.nrcs.usda.gov/app/
- Montana soil and water conservation districts: http://swcdmi.org/

State Historic Preservation Office: http://mhs.mt.gov/Shpo

Tourism, UM – Institute of Tourism & Recreation Research: http://www.itrr.umt.edu

Tribal Resources:

- Blackfeet Tribal Environmental Permits: http://www.blackfeetenvironmental.com
- CSKT Natural Resources Department: http://nrd.csktribes.org/
- Montana Office of Indian Affairs: http://tribalnations.mt.gov/
- Tribal Historic Preservation Officer List: Search - NATHPO
- Tribal Directory Assessment Tool (TDAT): https://egis.hud.gov/tdat/

Vehicle Traffic Count (MDT): http://www.mdt.mt.gov/publications/datastats/traffic.shtml

Water

- Stream Record Extension Facilitator, USGS: USGS | National Water Dashboard
- Streamstats basin characteristics, USGS: http://water.usgs.gov/osw/streamstats/
- Water Resources Division, DNRC: http://dnrc.mt.gov/divisions/water ; ArcGIS Web Application (mt.gov)

- Water Rights Bureau, DNRC: http://dnrc.mt.gov/divisions/water/water-rights
- Water Right Query System, DNRC: DNRC Water Right Query System (mt.gov)
- Wetlands database, USFWS: http://www.fws.gov/wetlands/Data/mapper.html

Wild and Scenic Rivers: http://www.rivers.gov/montana.php

Wildlife

- Animal Species, MT Field Guide: http://fieldguide.mt.gov/default.aspx
- Animal Species of Concern: http://mtnhp.org/SpeciesOfConcern/Default.aspx?AorP=a
- Aquatic Invasive Species: Montana FWP AIS Surveys Dashboard 2021 (arcgis.com)
- Critical Habitat Mapper, USFWS: http://ecos.fws.gov/crithab/
- Crucial Areas Planning System/Habitat Assessment Tool: Habitat MT (HB 526) Funded Lands (arcgis.com)
- FWP Contact Map: http://fwp.mt.gov/gis/maps/contactUs/ (includes biologist responsibility areas)
- Maps and GIS Data, FWP: Montana Fish, Wildlife & Parks GIS Data (arcgis.com)
- Sage grouse management, FWP: Montana Fish, Wildlife & Parks GIS Data : Sage-grouse Habitat/Current Distribution (Montana) : Sage-grouse Habitat/Current Distribution (Montana) (arcgis.com)
- Sage grouse habitat conservation program, DNRC: http://sagegrouse.mt.gov/
- Sage grouse habitat map: https://sagegrouse.mt.gov/ProgramMap

EXHIBIT L: ENVIRONMENTAL EXHIBITS