

Memo

Date: Tuesday, June 01, 2021

Project: Stevi Wye Proposed Medical Facility Infrastructure

Introduction

In August of 2019, HDR conducted the “Wye Area Annexation Study” for the Town of Stevensville (TOS) to determine the feasibility of annexing the “Wye” area located about 1.5 miles northwest of Stevensville, Montana at the intersection of Highways 93 and 269. This area is primarily composed of commercial buildings with a few small to medium sized residences. The purpose of the study was to determine what infrastructure would be required to serve this area and the cost and impact of infrastructure expansion. The determination was based on the 2019 fiscal year population and estimated future water demands and wastewater flows. A copy of the annexation report can be provided upon request and a map of the Wye area is depicted below in Figure 1.



FIGURE 1. STEVENSVILLE WYE ANNEXATION AREA

A newly proposed medical facility located within the northern portion of the Wye area annexation is being discussed. The TOS has requested HDR to assess the minimum necessary infrastructure needed for the medical facility and its associated costs.

Basis of Design

Components of phases 1, 2, and 3 from the annexation report would be required for the proposed medical facility location. Within each phase, the water and wastewater infrastructure expansion for the medical facility would include only the infrastructure needed for the medical facility's water, wastewater, and fire flow requirements. The sizing of water and wastewater mains or "trunks" will be consistent with past annexation estimates so as to allow future annexation without having to increase main diameters in the future. Other annexation extensions and service lines or "branches" will not be included in the hydraulic or cost analysis. See Figures 2 and 3 below for a depiction of the required infrastructure.

Hydraulic Analysis

The existing water model for the TOS uses WaterGEMS software and has been updated as part of the scope of work HDR is performing for the TOS Water PER. Since its creation in 2009, it has been updated with system updates, as-built information, and projected water demand up to 2040. The phased improvements mentioned in the original annexation report have been added to the existing model for the purpose of the PER and this study. These updates will allow for the analysis to include the impact of projected growth on available fire flow and hydraulics for the medical facility. The model was run and analyzed to ensure pipe velocities, system pressures, and fire flow values meet MDEQ Circular 1 requirements under average day demand (ADD) and max day demand (MDD) with the addition of medical facility infrastructure.

A Needed Fire Flow (NFF) of 2,500 gpm was estimated using AWWA Manual M31 and ISO fire flow estimation standards. A fire flow analysis tool in the water model calculated a total available fire flow of 2,500 gpm at the proposed medical facility location while maintaining minimum pressure requirements under MDEQ Circular 1.

The wastewater flows and main sizing analysis from the annexation study was incorporated into this memo as the wastewater flows from the medical facility would not likely impact the originally modeled sizing.

Cost Analysis

For estimating capital costs for the alternatives presented, cost data was derived from local suppliers of materials and equipment and recently bid projects with similar design aspects whenever possible. Project capital costs not only include the estimated costs for labor and materials to construct the improvements, but also include allowances for contractor mobilization, bonding, permits, and contingencies. More recent internal price inflation data correlated to the effects of COVID-19 on infrastructure projects also informed the cost analysis for estimates used from the original study in 2019.

The costs also include a 20 percent allowance for technical services (e.g. engineering, construction administration, grant administration, etc.) and a 20 percent contingency. A contingency of 20 percent is believed to be justified to account for project uncertainty given the limited level of detail developed at this preliminary stage of the project. A summary and detailed estimate of the cost for the infrastructure improvements are included in Tables 1 to 3.

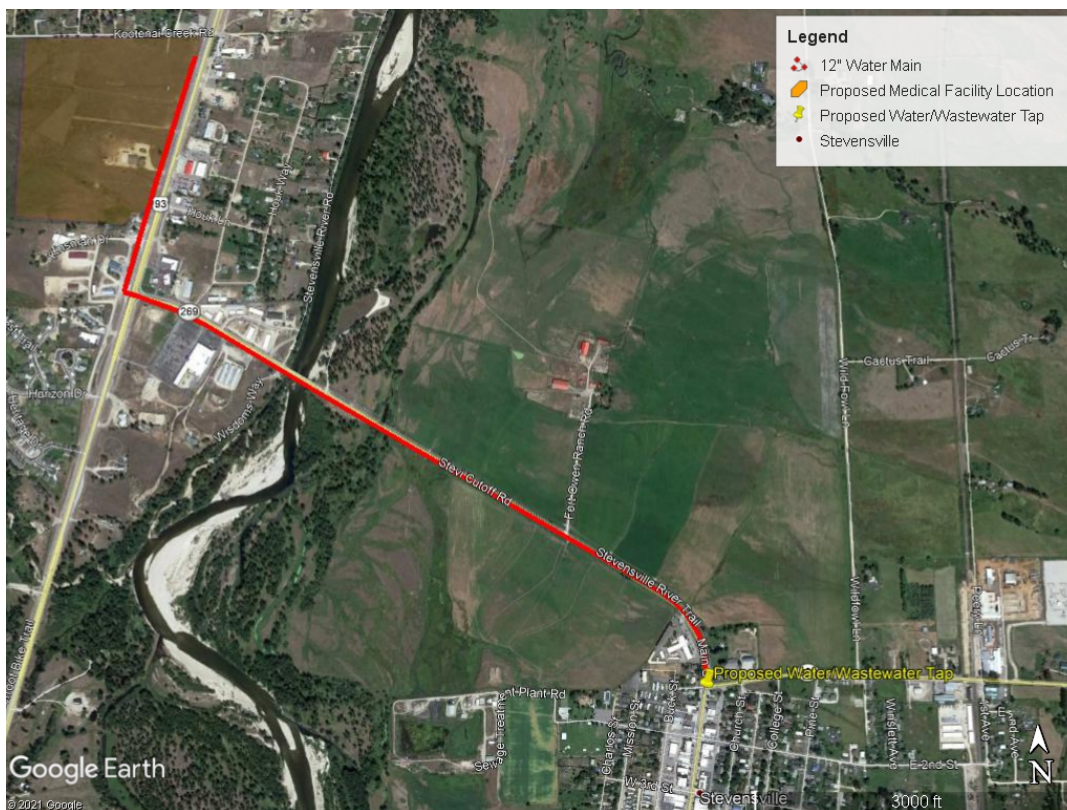


FIGURE 2. PROPOSED MEDICAL FACILITY WATER INFRASTRUCTURE

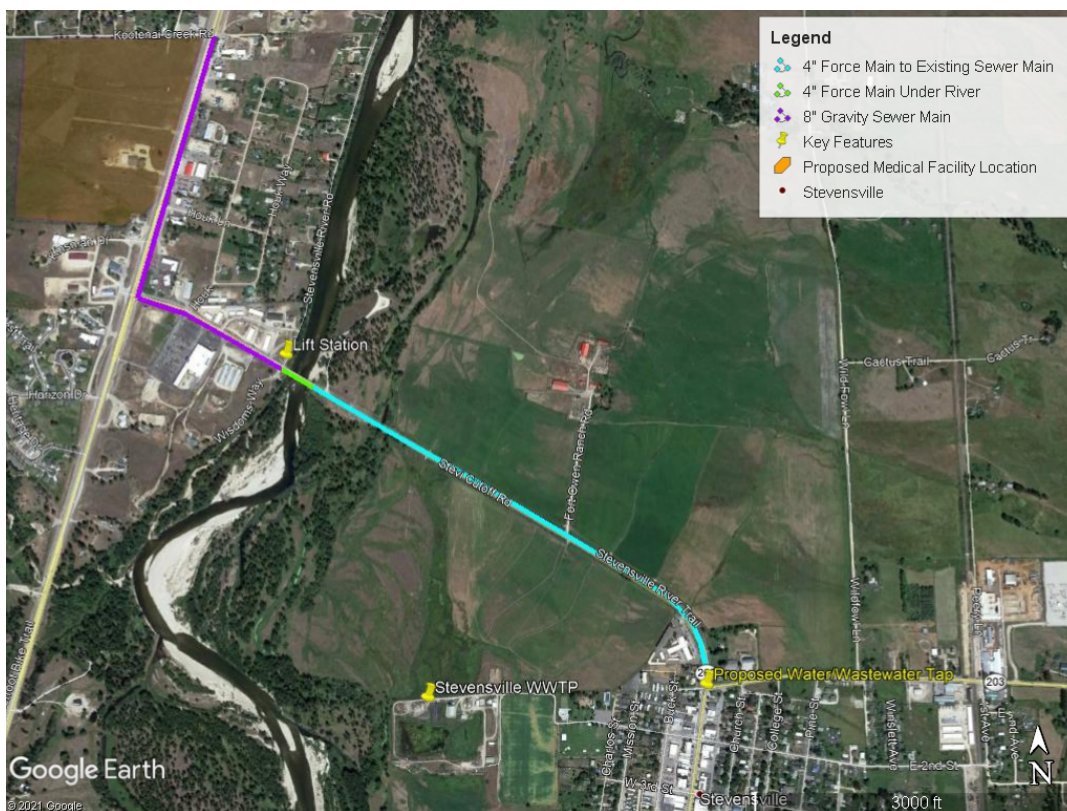


FIGURE 3. PROPOSED MEDICAL FACILITY WASTEWATER INFRASTRUCTURE

TABLE 1. MEDICAL FACILITY INFRASTRUCTURE COST ESTIMATE SUMMARY (\$USD)

Item	Qty.
Water Infrastructure	\$ 1,241,000
Wastewater Infrastructure	\$ 1,687,200
Current Total Estimated Cost	\$ 2,928,200

TABLE 2. MEDICAL FACILITY WATER INFRASTRUCTURE DETAILED COST ESTIMATE (\$USD)

Item	Qty.	Unit	Unit Price (\$)	Total (\$)
Division # 1 - Special Conditions				
General Conditions, Mobilization, and Permits	1	LS	81,600	81,600
Division # 2 - Site Work				
12" Water Main	5,720	LF	70	400,400
12" Isolation Valve	10	EA	4,000	40,000
Fire Hydrants	2	EA	7,200	14,400
Water Service Connection	1	EA	1,800	1,800
Asphalt Resurfacing	2,460	YD ²	95	233,700
Seeding and Topsoil	13,980	YD ²	6	83,900
Water System Tie-In	1	LS	6,000	6,000
Subtotal Construction				\$ 861,800
Contingency			20%	172,360
Estimated Construction Costs				\$ 1,034,160
Engineering			20%	206,832
Total Estimated Cost				\$ 1,241,000

TABLE 3. MEDICAL FACILITY WASTEWATER INFRASTRUCTURE DETAILED COST ESTIMATE (\$USD)

Item	Qty.	Unit	Unit Price (\$)	Total (\$)
Division # 1 - Special Conditions				
General Conditions, Mobilization, and Permits	1	LS	109,700	109,700
Division # 2 - Site Work				
4" Force Main	4,869	LF	25	121,800
4" Force Main Under River	310	LF	80	24,800
8" Gravity Sewer Main	4,035	LF	100	403,500
Manholes	12	EA	6,500	78,000
Lift Station Install	1	LS	200,000	200,000
Sewer Service Connection	1	EA	6,000	6,000
Asphalt Resurfacing	1,090	YD ²	95	103,600
Seeding and Topsoil	20,200	YD ²	6	121,200
Wastewater System Tie-In	1	LS	3,000	3,000
Subtotal Construction				\$ 1,171,600
Contingency			20%	234,320
Estimated Construction Costs				\$ 1,405,920
Engineering			20%	281,184
Total Estimated Cost				\$ 1,687,200