



Derek Starkey, P.E.
City Engineer
City of Fernley-Public Works Dept.
595 Silver Lace Blvd.
Fernley, NV 89408

June 30, 2020

Re: **Proposal for Engineering Services
Sewer Master Plan Update**

Dear Mr. Starkey,

At your request Shaw Engineering (Shaw) is pleased to submit an engineering services proposal for updating the City of Fernley's Sewer Master Plan. As development is beginning to accelerate again in Fernley, we understand the City desires to update the 2009 sewer master plan to prepare for new growth and analyze and correct known and possible deficiencies throughout the system.

We understand the goals of the City for the Sewer Master Plan Update include:

- a. Make necessary adjustments to the sewer master plan for growth rates, inflation, development patterns and system needs.
- b. Analyze the current master plan, wastewater treatment system (capacity) and sewer collection system.
- c. Analyze current development projects, current planning and zoning and future development and planning.
- d. Identify and prioritize required improvements to the sewer collection system, lift stations and treatment system (capacity of treatment plant only).
- e. Recommend broad system-wide solutions.
- f. Provide a plan which provides the framework for improving the capacity and efficiency of the system.
- g. Identify improvements which to be completed by new development.

The scope of work envisioned for the Sewer Master Plan Updated is envisioned more specifically as follows:

Scope of Work

1. Overview
 - a. Provide an overview and update of the general information for the current Sewer Collection, Lift Station and Treatment Systems.
 - b. Review overall system planning areas.
 - c. Review recent major system improvements.
 - i. Collection system rehabilitation projects.
 - ii. Lift station rehabilitation projects
 - iii. Developer lift stations acquired
 - iv. Wastewater Treatment Plant pond lining

- v. Wastewater Treatment Plant sludge projects
 - d. Provide an overview and reference to the recently completed sewer system capacity analysis technical memorandum.
 - e. Discuss current discharge permit.
2. Existing Sewer System Facilities
- a. Provide a summary and figures of the collection system, lift stations, forecemains and E-One areas.
 - b. Provide a summary of the wastewater treatment plant, including capacity and reference to recent improvements completed.
 - c. Review the collection system interceptors within the existing system.
 - d. Provide tables and review of all existing lift stations, including information regarding number/size of pumps, size/depth of wet well, construction date, etc.
 - e. Review number of customers/connections and sizes as available.
 - f. Review known problem areas reported by the City and areas which exceed design capacity in the model and/or flow monitoring.
 - g. Review current collection system standards including emergency storage and depth over diameter (d/D) ratios.
 - h. Review areas served by septic systems.
3. Flow Monitoring and Analysis
- a. Provide coordination for field installed flow monitoring to review existing system flows and peaking.
 - b. Utilize ADS Environmental Services to provide up to 9 flow monitoring velocity flow meters at strategic locations throughout the collection system.
 - c. Monitor flows for up to two months.
 - d. Provide data analysis and complete summary of collection system flows.
 - e. Provide updated observed equivalent residential sewage flows and peak factors based on monitoring data. Include dry weather and wet weather peak factors as available.
 - f. Include analysis of daily wastewater treatment plant flows alongside flow monitoring data.
4. Review of Updated Comprehensive Plan
- a. Review Land Use and Zoning including projected growth of each respective land use type and provide summary for reference.
 - b. Review current recorded final maps which are not built. This will include working with City GIS data to confirm all final maps and analyze data for any major changes proposed to any mapped areas.
 - c. Review of planning horizons and immediate build-out areas (tentative maps, commercial master planning, etc.). This will provide an analysis of the planning work completed throughout the community that is at a higher level than general land use. This subsection will allow Shaw to provide an overview of the imminent growth areas.
 - d. Review growth areas spatially (GIS data from City incorporating Comprehensive Master Plan Areas) and review growth projections as data is available. The

Comprehensive master plan utilizes a 20-year planning horizon as well as a 2040 population estimate. We will cross reference and analyze the 2040 land use buildout for the demand projections in Section 5 below.

- e. Attend meetings with City engineering and planning staff to review the comprehensive plan and current and projected development trends.

5. Flow Projections

- a. Provide sewer flow forecasting based on two distinct scenarios:
 - i. The identified immediate buildout areas (tentative maps with imminent final maps and final maps with delayed buildout).
 - ii. Comprehensive Master Plan 2040 planning horizon.
- b. Review capacity of the wastewater treatment plant based on current discharge permit limits and identify approximate flows which will trigger updates. It is understood the wastewater treatment plant cannot support the 2040 planning horizon without upgrades.
- c. Review firm capacity of the lift stations and forcemains throughout the system.
- d. Flow projections will be based on flow monitoring data.
- e. Rate study review. This will include review and summary of the Hansford Economic Analysis rate recommendations. The current implementation by the City of the recommendations will be reviewed and recommendations for future rate studies will be provided.

6. Infrastructure Planning

The infrastructure planning component will discuss the previous studies and master planning efforts. This infrastructure planning section will be formatted to be easily updated every five years. We will focus on two distinct areas; current system needs and accommodating build-out type scenarios. This effort will be focused on the infrastructure only and will utilize actual system flows to provide realistic data that the City can utilize and update.

- a. The first section will focus on City capital projects which are **currently planned** (major improvements the City knows it needs and is working to budget for in the near term). This may also include new projects that are identified through updates to the hydraulic model.
 - i. We will meet with City Public Works and Engineering staff to review any known system deficiencies and vulnerabilities. This will include reviewing all lift stations, screening facilities and treatment plant with the operators and attending site visits to all facilities.
 - ii. We will include a review of the current hydraulic model and identify any flow deficient areas. Lift station cycling and analysis will be reviewed and any recommended improvements identified.
 - iii. We will include, as part of the infrastructure analysis, the minimum improvements/core City priorities (if growth stopped tomorrow, what would the immediate future look like for the sewer system planning goals). This will overlap with the recommendations and observations of the system operators and will add any minimum improvements discovered through the modeling and infrastructure review by Shaw.

- iv. Additional analysis will be completed based on the results of the flow monitoring in Task 3. Wet weather peaks will be analyzed as available and any areas with higher than average suspected inflow and infiltration (I&I) will be identified for further analysis and correction. In the absence of wet weather during modeling, lift station flows will be compared against weather patterns and similar recommendations will be made as applicable.
 - v. Lastly we will complete a vulnerability assessment of the wastewater system. This will include reviewing emergency response procedures with public works staff and expanding on any known limitations for properly responding to emergency scenarios. We will highlight key critical backbone infrastructure and review options for maintaining minimum levels of service after a catastrophic loss/event. Items envisioned to be covered include loss/damage to a major mechanical or electrical system at a critical pumping location, treatment system or other major water quality failure at the wastewater treatment plant, break of a major forcemain or other collection system backups and most vulnerable areas for sanitary sewer overflows (SSOs). We will provide recommendations for CIP's deemed most critical/beneficial to help increase emergency preparedness of the vulnerable systems.
- b. The second section of the infrastructure planning will be based on the 2040 buildout **growth areas** identified in the Comprehensive Master Plan as well as the immediate growth areas.
- i. Hydraulic modeling will be completed for both immediate growth and 2040 buildout scenarios. Observed flow monitoring will be utilized for background conditions of the hydraulic model.
 - ii. This planning will focus on expansion of infrastructure based on actual flows for growth areas.
 - iii. The hydraulic model updates will be limited to the immediate growth and 2040 buildout scenarios. This will help identify which critical improvements will be needed and when they will be needed. As development comes in, portions of the build-out hydraulic models can be turned on as necessary to serve the new flows. The work items under this task will provide the framework for the improvements needed; any cost sharing or upsizing coordination is not included and is expected to be completed when each development is permitted and modeled.
7. City Council Meetings
This task will include attending City Council meetings to review the master plan recommendations. A brief overview of the master plan recommendations will be prepared for presentation to the City Council. The total number of meetings requiring attendance may change throughout the development of the master planning effort, however two meetings are assumed for this proposal.

We are eager to complete this water master plan update. As we review recently completed planning and infrastructure work by the City; we will strive to ensure the City has a structure for

growth to pay for itself. We thoroughly understand the struggles of managing growth while taking care of aging infrastructure and we look forward to continuing to partner with the City to identify strategies to meet these challenges.

Our estimated engineering fee to complete this work as follows:

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| Task 1: System Overview | \$12,000.00 |
| Task 2: Existing Sewer System Facilities | \$17,000.00 |
| Task 3: Flow Monitoring and Analysis | \$69,500.00 |
| Task 4: Review of Updated Comprehensive Plan | \$5,000.00 |
| Task 5: Flow Projections | \$9,500.00 |
| Task 6: Infrastructure Planning: | \$19,000.00 |
| Task 7: Meetings: | \$1,500.00 |
| Estimated Total Fee: | \$133,500.00 |

Our fee to provide these services will be \$133,500.00 and will be billed monthly based on time and materials at our current fee schedule attached.

If you have any questions please feel free to contact me at (775) 329-3962 or cody@shawengineering.com.

Sincerely,

SHAW ENGINEERING



Cody Black, P.E.
Principal Engineer



2020 FEE SCHEDULE

PROFESSIONAL

| | |
|--------------------------|-------------------------|
| Principal | \$160.00/hr |
| Project Manager | \$150.00/hr |
| Senior Engineer | \$140.00/hr |
| Professional Engineer II | \$130.00/hr |
| Professional Engineer I | \$115.00/hr |
| Staff Engineer II | \$100.00/hr |
| Staff Engineer I | \$ 90.00/hr |
| Expert Testimony | |
| Consultations | \$155.00/hr |
| Reports/Preparations | \$350.00/hr |
| Trial/Depositions | \$400.00/hr (4 hr.Min.) |

TECHNICAL

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|---------------------------|-------------|
| Engineering Technician | \$ 90.00/hr |
| Planning Technician | \$ 80.00/hr |
| Drafting/Technician II | \$ 80.00/hr |
| Drafting/Technician I | \$ 70.00/hr |
| Construction Inspector II | \$ 95.00/hr |
| Construction Inspector I | \$ 85.00/hr |

ADMINISTRATIVE

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|-----------------------------|-------------|
| Office Administrator | \$ 65.00/hr |
| Administrative Assistant II | \$ 55.00/hr |
| Administrative Assistant I | \$ 45.00/hr |

OTHER

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|----------------|--------------|
| Subconsultants | Cost + 15% |
| Mileage | \$0.70/mile |
| Per Diem | \$125.00/day |
| Expenses | At Cost |

The cost for office equipment, office supplies, hardware and software utilized during a Project is included in the fee schedule. Per Diem applies to Construction Inspectors that are required to spend one night or more on the Project.