

WORK SESSION STAFF REPORT
Work Session Item No. 2

Date: March 2, 2020
To: City Council
From: Michael Grochala, Community Development Director
Rick DeGardner, Public Services Director
Re: Water Treatment Facility Feasibility Study

Background

At the February 3, 2020 City Council work session staff discussed the need to prepare a Water Treatment Plant feasibility study to evaluate future water treatment options. Staff has worked with WSB and Associates to identify the necessary scope of the study.

WSB has submitted a proposal to complete the study for \$39,886. The study components include:

- 1) Evaluation of Alternative Water Supply Options to address short to mid-term needs.
- 2) Analyze Source Water
- 3) Evaluate Water Treatment Options
- 4) Review Potential Plant Site
- 5) Prepare Centralized Water Treatment Plan Preliminary Drawings
- 6) Evaluate future system needs and phasing
- 7) Study Neighborhood Impacts
- 8) Determine Estimated Costs

WSB is proposing to complete the Study by June 1, 2020. Architectural renderings are not included in this phase of the proposal but can be provided for an additional fee. No public outreach is included at this time. Staff would anticipate that both architectural renderings and a public information meeting would be part of a future project development phase.

Requested Council Direction

Staff is requesting City Council direction to place consideration of the WSB proposal on the March 9, 2020 agenda.

Attachments

1. WSB Water Treatment Facility Feasibility Study proposal



February 25, 2020

Mr. Rick DeGardner
Public Services Director
City of Lino Lakes
600 Town Center Parkway
Lino Lakes, MN 55014

Re: Proposal for Water Treatment Plant Feasibility Study
City of Lino Lakes, MN

Dear Mr. DeGardner:

We appreciate the opportunity to submit this letter proposal to the City of Lino Lakes to complete the Water Treatment Plant Feasibility Study. The Minnesota Department of Health recently tested the City's manganese levels in each of the City's wells as part of the EPA Unregulated Contaminant Monitoring Rule 4 (UCMR4). The water quality testing data from MDH indicates that five of the City's six wells exceed the maximum recommended manganese level for infants (100 ppb), and three of the wells exceeds the maximum recommend manganese level for adults and children (300 ppb). Therefore, the design and construction of a water treatment plant should be studied to treat the high levels of manganese that exist in the City's drinking water in addition to treating other contaminants such as iron and ammonia. Alternative water supply options will also be evaluated as part of this study.

I. SCOPE OF WORK

1. Alternative Water Supply Options

In lieu of constructing a water treatment plant(s) to treat the City's existing wells, alternative water supply options will also be evaluated. These options include:

- A. Drilling new wells
- B. Purchasing treated water from another community or water utility

2. Analyze Source Water

All existing water quality data for the City's existing wells will be reviewed with respect to primary and secondary drinking water standards as well as contaminants and emerging contaminants. We recommend completing additional testing for any key water quality parameters (ex. ammonia, total organic carbon, emerging contaminants, etc.) that possibly have not been tested to date by the City. Our team will then develop a comprehensive treatment plan that addresses all identified contaminants, ensures regulatory compliance, and produces high quality water for the City's customers. WSB will also look ahead and evaluate the water quality parameters that will likely need to be evaluated for both conventional and biological filtration for the water treatment pilot testing to be completed in the next phase of the project. It is assumed for this study that the City will pay for all water quality testing.

3. Water Treatment Options

Upon completion of the source water analysis, we will explore available water treatment options and the recommending preferred processes for treating known and emerging contaminants that will potentially need to be treated over the anticipated life of the water treatment plant(s). The report will examine available treatment process options for identified contaminants potentially needing treatment, recommend a preferred treatment process for each identified contaminant, identify required space needs for preferred treatment processes, provide recommendation as to the required size and preferred location for the facility, and provide cost estimates for constructing and operating the facility. We will study both conventional and biological filtration and present their benefits.

The iron, manganese, and ammonia in the City's water could be treated without chlorine and potassium permanganate with biological filtration. Biological filtration is commonly practiced in the United States and Europe and is endorsed by the Minnesota Department of Health (MDH) as an efficient and effective method for treating these (and other) contaminants. The benefits of biological filtration include higher filtration rates, longer filter runs (reduces backwash supply and wastewater volumes), savings in chemical costs, and reduction in disinfection byproducts. The design of a conventional gravity filtration process with detention and aeration can easily be modified to accommodate biological filtration after the successful completion of a biological filtration study as required by MDH.

WSB will coordinate and attend tours of existing water treatment facilities that utilize each of the treatment methods being evaluated so that City staff have a clear understanding of the treatment technologies and options that are available for the water treatment plant. The analysis will include, but not be limited to, initial construction costs, long term operational costs, the ability of each system to effectively and efficiently remove iron, manganese, ammonia, and other contaminants from the water supply, the discharge of the waste product, and the ability of the plant to be expanded or be modified in the future. This will be a comprehensive review and recommendation on the "best" plant to meet the current and future needs of the City.

4. Review Existing Site

A potential site for the proposed water treatment plant has been identified at the southwest intersection of Birch Street and 12th Avenue South. The WSB team will visit the proposed water treatment plant site and review the existing wetlands in the area. We will also review the as-built drawings, easements, and existing infrastructure to determine if the site is feasible for further consideration for the water treatment plant. Potential contaminants and other barriers that may restrict or affect the layout of the plant at the site will be evaluated up front during this analysis. Other factors such as ease of chemical deliveries, access for maintenance trucks, security, stormwater retention, proximity to water and sanitary sewer utilities, proximity to three phase-480 volt electrical power, proximity to existing and future wells, and the potential for the City to acquire the property will be evaluated during the preliminary design phase.

5. Centralized Water Treatment Plant Preliminary Drawings

We will prepare one preliminary water treatment plant floor plan drawing and one preliminary conceptual site plan drawing for a gravity filtration plant constructed at the southwest intersection of Birch Street and 12th Avenue South. The floor plan drawing will show the various recommended rooms and dimensions for the plant. The conceptual site plan will also show space for a future water treatment plant expansion.

6. Water Distribution System Modeling and Watermain Phasing Plan

Preliminary water distribution system modeling has indicated that a centralized water treatment plant could initially treat Wells 1, 3, 5, and 6, and without upsizing the existing 16-inch watermain on Birch Street. The City's maximum day water demands will eventually exceed the hydraulic capacity of the existing 16-inch watermain on Birch Street. If Wells 2 and 4 are left untreated and used only as peaking wells on maximum day demands, the existing 16-inch watermain should have adequate hydraulic capacity to convey treated water from a centralized water treatment plant for the next 10 to 15 years based on the water demand projections in the City's Comprehensive Plan. At that time, a parallel 16-inch watermain will need to be constructed along Birch Street and extended westward and eastward in phases as the capacity of the water treatment plant is increased and possibly expanded in the future with new wells pumping to the plant. Constructing a future plant expansion and a parallel 16-inch watermain in phases along Birch Street will be evaluated as part of this study. The raw watermain costs to be constructed from the City's existing wells to the centralized water treatment plant will also be figured-in to the estimated costs.

7. Study Neighborhood Impacts

The preliminary design report will explore potential impacts of the water treatment facility on neighboring properties due to noise, odors, operating hours, traffic, and other identified sources of impact and recommend a process for mitigating any identified impacts during the final design process. Neighborhood meetings are not anticipated for this study phase and not included in this proposal.

8. Determine Estimated Costs

The preliminary design report will include estimated construction and operating costs for the groundwater treatment facility over the anticipated life of the facility. Estimated costs will assume industry standard costs for a gravity filtration water treatment plant. In addition, life cycle costs will be prepared for each alternative to provide a complete capital-life cycle cost analysis over a 20 to 30-year planning period. The report will explore future budget impacts based on estimated construction and operating costs and will explore and recommend "order of magnitude" water rate revisions needed to offset future budget impacts to fund the water treatment plant. This analysis does not replace a water rate study that should also be completed under a separate project.

9. Report Preparation

The findings, estimated costs, and recommendations from the study will be summarized in a report along with report figures and presented to the City Council.

10. Meetings

We will coordinate, prepare handouts, and attend up to four (4) meetings with City staff and three (3) City Council meetings to discuss the report.

II. SCHEDULE AND ESTIMATED FEES

A. Project Schedule

We have estimated the time for the project to begin immediately after City authorization. The proposed schedule includes the following milestone dates:

| Task | Completion Date |
|---|-----------------|
| City Council Authorization to Proceed | March 9, 2020 |
| Complete Feasibility Study | May 15, 2020 |
| Present Feasibility Study to City Council | June 1, 2020 |

B. Estimated Fees

Compensation for tasks shall be on an hourly basis, based on the actual hours worked for personnel assigned to the project. We propose to perform these services for an hourly, not-to-exceed fee of \$39,886. A spreadsheet showing the estimated hours for each task is attached to this proposal. Architectural renderings are not included in this phase of the project but can be provided for an additional fee of \$1,800 per rendering if requested by the City. Geotechnical services are also not included in this phase of the project. We will rely on previous soil borings to study the existing soil conditions at the proposed site.

We will invoice the City on the basis of actual hours spent at current billing rates. Additional services requested by the City will be invoiced on the basis of actual hours spent at current billing rates plus the actual cost of reimbursable expenses. All services will be invoiced monthly. Our billing rates will be adjusted on an annual basis. A detailed list of project tasks is defined and shown on the attached task hour budget worksheet. Tasks not shown are considered outside of the scope of services.

This letter represents our understanding of the Water Treatment Plant Feasibility Study. If you are in agreement with the scope of services and proposed fee, please sign in the appropriate space below and return one copy to us.

If you have any questions about this proposal, please feel free to call me at (612) 209-0140.

Sincerely,

WSB



Greg F. Johnson, PE
Director of Water/Wastewater

Cc: Diane Hankee, PE, WSB

ACCEPTED BY:

City of Lino Lakes

Name _____



**Estimate of Hours and Fees
City of Lino Lakes, Minnesota
Water Treatment Plant Feasibility Study**

| Task Description | Estimated Hours | | | | | | | | Total Hours | Cost |
|--|---------------------|---------------------|------------------------|-----------------------------|---------------------|---------------------|-------------------|-----------------------|--------------------|-------------|
| | Project Manager | City Engineer | Project Engineer | Process Drafting Technician | Landscape Architect | Landscape Designer | Wetland Scientist | Admin | | |
| | <i>Greg Johnson</i> | <i>Diane Hankee</i> | <i>Jon Christensen</i> | <i>Greg Glunz</i> | <i>Eva Kelly</i> | <i>Shaunna Berg</i> | <i>TBD</i> | <i>Karla Pederson</i> | | |
| 1.1 Alternative water supply options | 2 | 1 | 8 | | | | | | 11 | \$1,506.00 |
| 1.2 Analyze source water | 1 | | 2 | | | | | | 3 | \$432.00 |
| 1.3 Water treatment options and plant tours | 8 | | 8 | | | | 2 | | 18 | \$2,746.00 |
| 1.4 Review of existing site | 4 | 1 | 4 | | | | | | 9 | \$1,410.00 |
| 1.5 Centralized WTP preliminary drawings | 12 | 1 | 4 | 40 | 8 | 20 | | | 85 | \$11,498.00 |
| 1.6 Water distribution system modeling and watermain phasing | 4 | 1 | 16 | | | | | | 21 | \$2,850.00 |
| 1.7 Study neighborhood impacts | 1 | 1 | 3 | | | | | | 5 | \$714.00 |
| 1.8 Determine estimated costs | 8 | 1 | 8 | | | | | | 17 | \$2,658.00 |
| 1.9 Report preparation | 18 | 2 | 40 | | | | | 8 | 68 | \$9,332.00 |
| 1.10 Meetings | 21 | | 21 | | | | | 2 | 44 | \$6,740.00 |
| Total Estimated Hours and Fees | 79 | 8 | 114 | 40 | 8 | 20 | 2 | 10 | 281 | |
| Average Hourly Billing Rate | \$192 | \$162 | \$120 | \$150 | \$119 | \$80 | \$125 | \$94 | | |
| TOTAL PROJECT COST | | | | | | | | | \$39,886.00 | |