AGENDA BILL Item 7.A	**Sudden Valley Water Treatment Plant Alternatives Analysis Briefing #2**		
DATE SUBMITTED:	November 19 , 2020	MEETING DATE:	November 25, 2020
TO: BOARD OF COMMISSIONERS		FROM: Bill Hunter, Assist. GM/District Engineer	
GENERAL MANAGER APPROVAL			
ATTACHED DOCUMENTS		1. Draft Technical Memorandum – Tier 2 / Tier 3 Seismic Evaluation 2. Draft Technical Memorandum – Chemical Systems Analysis	
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐ / INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT

The existing Sudden Valley Water Treatment Plant (SVWTP) is located along Morning Beach Drive near the shores of Lake Whatcom and was constructed in 1972. The treatment plant utilizes chemical coagulation, flocculation, rapid media filtration, chemical pH adjustment, and gas chlorine disinfection prior to temporary storage within a 225,000-gallon reservoir also located at the site.

In July 2020, Gray & Osborne (G&O) completed a condition assessment in which engineers evaluated the SVWTP from a process, structural/architectural, mechanical, and electrical perspective. The assessment identified both high and low priority items that should be completed to maintain current and reliable function of the SVWTP into the future.

Following the condition assessment, G&O was contracted to perform an alternatives analysis to help the District select and prioritize specific short- and long-term improvements to the treatment equipment and processes currently in use. The work has been broken down by major systems. For each system, G&O will develop alternatives and document each in the form of a technical memorandum. The results from each system analysis will be presented to the Board at regularly scheduled board meetings.

All of the technical memoranda will ultimately be attached and summarized in an Alternatives Analysis Report. The Report will include comparisons and rankings, recommendation on modifications to system, cost estimates, figures to relay relative space requirements, and more.

The major systems as written in the scope of work agreement are:

- Pump Performance Test *(Presented to Board 9/30/2020, Briefing #1)*
- **Chemical Systems Analysis**
- Disinfection Systems Analysis
- Backwash Systems Analysis
- Filtration System Analysis
- **Tier 2/3 Seismic and Structural Analysis**
- Structural/Arch Workspace Analysis
- NACE III Coating Inspection *(Presented to Board 9/30/2020, Briefing #1)*

G&O has completed the Tier 2/3 Seismic and Structural Analysis and the Chemical Systems Analysis. Draft technical memoranda are attached. The consultant will summarize their findings and recommendations in a presentation, and collect Board comments or questions.

Highlights from Tier 2 / Tier 3 Seismic Analysis (excerpts from Executive Summary on Page 2 in Tech Memo)

> *Deficiencies and retrofits for the buildings are separated into two categories: structural and nonstructural. Structural refers to any part of the main structure of the building while nonstructural refers to any item that is supported from the main structure.*
>
> *For the Main Building, no structural deficiencies were found so no structural retrofits are recommended. Nonstructural retrofits with an estimated construction cost of $118,000 are recommended based on seismic deficiencies identified.*
>
> *For the Pump Building, structural and nonstructural retrofits with an estimated construction cost of $291,000 are recommended based on seismic deficiencies that were identified.*
>
> *The SVWTP reservoir was seismically evaluated in 2016 and found to have foundation and piping flexibility deficiencies. The estimated construction cost for addressing these efficiencies is $200,000 after adjusting to 2020 dollars.*

Highlights from Chemical Systems Analysis (excerpts from Summary of Recommendations and Cost Estimates on Page 14 in Tech Memo)

> *As noted above, the District has had good success utilizing liquid alum delivered via a commercial vendor as a coagulant for their water treatment process. However, it was noted that the existing alum storage tank is beyond its recommended useful life, does not contain seismic restraints, is cumbersome to fill and lacks direct line of sight between the parking lot and the tank, and the chemical metering pump equipment requires manual calibration on a daily basis. Furthermore, the proximity of chemicals and moisture to electrical and mechanical equipment may be accelerating the corrosion exhibited on this equipment.*

Because liquid alum is a cost-effective coagulant with a proven track record of success for the Lake Whatcom source, we recommend that the District continue to utilize liquid alum coagulant delivered by a commercial vendor. Furthermore, we recommend that the WTP relocate the chemical systems to a new building in order to provide separation from the electrical components, additional chemical storage capacity, and line of sight for chemical deliveries. Lastly, we recommend that the chemical metering systems be upgraded to include metering pump skids that include calibration columns and various valves/piping to reduce the level of effort required to calibrate the chemical dosing equipment.

The proposed building would accommodate the new alum storage tank and chemical metering skid. The tank would have the design criteria listed in Table 2.

We also recommend that the District utilize a chemical metering pump skid to move alum from the storage tank described above to the injection location in the WTP Main Building. The metering pump skid would include a single pump as well as the components listed previously.

For soda ash, we recommend that the existing tank be relocated to the proposed chemical building and provided with seismic bracing. The existing mixer should be replaced with a new, similarly sized unit, and the existing platform should be sandblasted and recoated to prevent additional corrosion. Additionally, we recommend that a custom shelf be fabricated and rest on the wall of the soda ash tank. This will allow WTP staff to rest the soda ash bags on the shelf, cut the soda ash bags, and dump them to the tank with minimal lifting and hoisting, thus reducing the physical load on the staff during soda ash addition.

The proposed building should be at least 500 square feet and would include two double doors and one 10-foot wide manually operated coiling door. This will allow for suitable access to the building and easy chemical delivery. The building should be large enough to accommodate the chemical delivery and storage equipment, additional dry chemical storage, and still be expandable as required based on future needs. The building will be provided with electrical service, and this service will be sub-fed provided from the existing WTP Finished Water Pump Building supply. New heating and ventilation equipment will be provided for the building, which will increase the overall electrical load. The additional load will be relatively small and as such, it is assumed that the existing electrical service has sufficient capacity. The Assessment Report did note several potential issues with both the capacity of the electrical service for accommodating additional load as well as with the existing utility transformer size. If a new building is constructed as recommended, a formal electrical analysis should be provided once preliminary sizing of the HVAC equipment is available to determine the full scope of electrical modifications required.

FISCAL IMPACT

This presentation is for discussion only; it is too early in the planning process to estimate fiscal impacts of plant improvements.

RECOMMENDED BOARD ACTION

No action is recommended at this time.

PROPOSED MOTION

Not applicable.