June 15, 2022

Kelly Duval, P.E.
Professional Engineer 1, Division of Water
New York State Department of Environmental Conservation
232 Golf Course Road
Warrensburg, NY 12885

RE: Town of Lake George
Caldwell Sewer District
Upper and Lower Pump Station Improvements
Basis of Design Engineering Report
LaBella Project No. 92103.01

Dear Ms. Duval:

Executive Summary

In 2018, Chazen Companies, now LaBella Associates (LaBella) prepared and submitted to the New York Department of Conservation (NYSDEC), a Preliminary Engineering Report (PER), revised December 4, 2018 in response to a Notice of Violation (NOV) dated December 29, 2016. The PER describes the evaluation of the Caldwell Sewer District (CSD) infrastructure, which included an investigation of the Town's Upper Pump Station (UPS) and Lower Pump Station (LPS).

Following review of the PER and Chazen's responses to NYSDEC comments, the PER was approved by the NYSDEC in a letter dated January 24, 2019. In that approval letter, NYSDEC requested that the Town's Engineer "submit final engineering reports, plans, and specifications for the planned repairs or upgrades discussed in the approved report". In response to that request, this Basis of Design Engineering Report is provided to NYSDEC with the plans and specifications for review.

As described in the PER, the pumps at both pump stations were found to be substantially deteriorated and in need of repair or replacement. From the alternatives presented in the PER, the Town selected the alternative that involved replacement of all pumps at the UPS & LPS (6 total) plus some other needed improvements. The Town applied for funding through the WQIP program and was awarded a grant for the selected alternative.

At the Town's direction, LaBella commenced with design of the Pump Station Improvements for the selected alternative. Through in-depth site investigations and consultation with Town Operating Personnel, deficiencies were noted and a scope of work was developed for each pump station along with the associated construction costs.

A more detailed description of the evaluation, design, scope of improvements, and costs is included in the following report.

Background

In 2018, Chazen Companies, now LaBella Associates (LaBella) prepared a Preliminary Engineering Report in response to a Notice of Violation (NOV) dated December 29, 2016. The report describes the evaluation of the Caldwell Sewer District (CSD) infrastructure, which included an investigation of the Town's Upper Pump Station (UPS) and Lower Pump Station (LPS). The pumps at both pump stations were found to be substantially deteriorated and in need of repair or replacement. Three alternatives outlining improvements at the two pump stations were presented to the Town for consideration: Alternative #1. UPS & LPS Consolidation, Alternative #2. Rebuild Pumps, and Alternative #3. Replace Pumps and UPS/LPS upgrades.

The Town originally selected Alternative #1, however when the high costs for the proposed pump station improvements, were combined with the Town's ongoing improvements at the Wastewater Treatment Plant, the Town decided to pursue Alternative #3. Accordingly, the Town requested funding through the NYSDEC's Water Quality Improvement (WQIP) program, with the reasoning that this alternative will have similar water quality protections to Alternative #1 and provides better long term reliability than simply rebuilding the pumps as described in Alternative #2. The Town's request for WQIP funding was subsequently granted.

Pump Station Improvements Design

At the Town's direction, LaBella commenced with design of the Pump Station Improvements. Through in-depth site investigations and consultation with Town Operating Personnel, deficiencies were noted at each of the pump stations.

Our findings are summarized as follows:

- Each pump station has three dry-pit submersible pumps that each have a suction line into the wet well and then discharge into a common header that leads into the force main outside the pump station.
- There are isolation valves on each pump suction and discharge line, however there is currently no means to isolate the discharge header or force main in order to bypass flows around the pump station.
- Corrosion was found on the LPS discharge header, upstream of the pump discharge valves, and repairs to the headers and pump discharge valves will require means to bypass the station. The ability to bypass the pump stations is a priority of the Town and was included in the original Engineering Report Alternative #3.
- 20-year-old pumps are cavitating, not operating efficiently, and are approaching end of useful life.
- New pumps will require matching new variable frequency drives (VFDs).
- New pumps, controls, monitoring, and alarms will require SCADA upgrades and integration to existing.
- Recommend maintenance on generators to increase longevity versus replacement.

Pump Station Improvement Scope of Work/Benefits

Based on our findings and discussions with the Town, a scope of work was developed and is summarized with benefits as follows:

- Replace all pumps (6 total), motors, VFDs, controls all matched for performance. The proposed pumps were selected to meet or exceed the current pumping capacities, materials of construction, hazard classification (Class 1, Div 1), and layout of the pumps they are replacing. Pump information and curves for the proposed pumps are attached to this report.
- Install flow totalizer and instantaneous flow meter at both stations to allow monitoring and documentation of flows and pumping performance.
- Replace automatic dialers at both stations to alert operations personnel of alarms.
- Install float alarms at both stations in dry pit area to notify operations personnel of water in dry pit.
- Install bypass suction line in wet wells at both stations to allow bypassing of pump station during pump station improvements and future use by Town.
- Install bypass discharge into force main with throttling valve and force main isolation valve at both stations to allow bypassing/isolation of pump station during pump station improvements and future use by Town.
- Replace faulty sump pumps in pump pit at both stations.
- Replace inoperable pump suction and discharge isolation valves at both stations.
- Replace deteriorated discharge header piping in LPS to reduce risk of break.
- Upgrade SCADA to integrate new equipment with Town's existing system.

Plans and Specifications

The attached plans and specifications are construction documents intended to describe in detail the proposed scope of work for the Pump Station Improvements. The proposed pumps, equipment, materials to be used, and appurtenances are specified in the appropriate sections. The extent of work is detailed on the drawings and described in the summary of work and respective specification sections.

Cost Estimate

In 2018, the estimated cost for the preferred Alternative #3 was $818,000 ($2018), which is funded under the WQIP grant. Following recent site investigations and more detailed design, the scope of work was further defined. The current cost estimate is approximately $1.175M ($2022) and is attached to this report. Factors considered to be contributors to the cost increase:

- 4-years that have passed since the previous estimate.
- The scope of electrical/control/SCADA upgrades were not fully known at that time.
- The extent and complicated nature of work required to install bypasses for each pump station is better defined.

The Town is aware of these updated costs and will be funding those costs above funding provided through the WQIP Program.

Next Steps/Schedule

Following incorporation of NYSDEC review comments and approval, the Town will be requesting bids for the Pump Station Improvements. Following review of bids received and contract award, construction is expected to commence this year with completion in 2023.

If you have any questions or require further clarification, please do not hesitate to contact me directly at (518) 928-8474, or via e-mail to tbates@labellapc.com.

Respectfully submitted,

LaBella Associates

A. Thomas Bates, PE
Senior Project Engineer