

MEMORANDUM

To: Supervisor Dennis Dickinson, Town of Lake George

From: The Chazen Companies

cc: File

Date: November 20, 2015

**Re: Conceptual Pump Station Consolidation Feasibility Analysis
Caldwell Sewer District – Town of Lake George**

Introduction

Pursuant to the Town's request, we have completed a conceptual analysis of the probable scope and associated costs to consolidate the Upper Caldwell Sewer District Pump Station (hereinafter referred to as the Upper Pump Station (UPS)) and Lower Caldwell Sewer District Pump Station (hereinafter referred to as the Lower Pump Station (LPS)) that currently serve the Town's Caldwell Sewer District (CSD). Consolidation of the two pump stations is more specifically defined as eliminating the UPS, and upgrading the LPS and some associated conveyance infrastructure, such that the LPS can provide the service that both pump stations do currently. A project background, our analysis, and the findings associated with the project are presented for your consideration in this memorandum.

Background

Under current conditions, wastewater is conveyed by gravity from portions of the Caldwell Sewer District (CSD) to both the LPS and UPS. The LPS currently pumps to the UPS and subsequently, the UPS pumps to the Village WWTP. If the UPS is eliminated from the system, all flows that contributed to the UPS would be redirected to the LPS and subsequently pumped from the LPS directly to the Village WWTP. It is conceptualized that over the long term, savings to the Town could be achieved by virtue of not running two separate pump stations where one pump station can adequately provide service. A predication or estimation of long term savings has not been calculated as part of developing this memorandum.

Analysis

In support of studying the consolidation of the pump stations, our office:

- Reviewed limited flow data (meter data) for wastewater flows entering the UPS as provided by the Village of Lake George.
- Estimated the average daily wastewater flows entering the UPS by using NYSDEC standard projected wastewater generation flow rate from properties contributing wastewater to the UPS.
- Estimated the average daily wastewater flows entering the LPS by analysis of Town provided flow information.
- Used the above information to project the additional flows (as well as the sum of all flows) that the LPS would experience if the UPS was eliminated. We then used this information to develop conceptual system curves in order to select appropriate pumps. We work with Emerick Associates (Flygt Pump Representative) to conceptually select pumps required to accommodate the additional flows in the LPS. Our analysis, based on NYSDEC design flows for the area contributory to the UPS, suggests that it currently see approximately 30,000-gpd. However, observations made by Village forces on a weekday from 12:00pm to 1:00pm indicated that the flow was approximately 47,500 GPD. It is noted this observation was taken during the off season (non-summer) and there are significant seasonal variations. Based on historical flow data this appears to be approximately 25% of the total flow within the Caldwell Sewer District. Since the size of the pumps in the LPS are being increased and will operate on VFDs, it is

assumed that the rate of pumping will fluctuate to account for seasonal fluctuations in flow. However, all this information needs to be verified as the design is advanced.

- Reviewed available record documents to conceptualize the gravity and sewer force main infrastructure modifications required to redirect gravity flows from the UPS to the LPS as well as modify the forcemain to bypass the UPS from the LPS.
- Coordinated with R.L. Kistler Incorporated to conceptually determine the new generator required for the LPS, which would provide backup power to the station.

Project Scope

To complete the consolidation of the pump stations the following work is required:

- Installation of approximately 100-LF of 8" PVC SDR35 gravity sewer. This sewer would connect gravity sewer mains on Fort George Road, thus sending all sewer flow tributary to the UPS to the LPS. (this work is conceptualized on the enclosed concept plan in Attachment A)
- Installation of a connection between the existing 12" forcemain that discharges effluent from the LPS to the 14" forcemain the runs between the USP and the WWTP. This would include approximately 100-LF of forcemain along with two insertion valves for the existing mains, as well as a 14"x12" tapping sleeve and valve.
- Replacement of the 3 existing 60-HP pumps with 3 new 72-HP Flygt pumps and associated controls in the LPS should accommodate the additional flows and head conditions (to pump to the WWTP). We note that these are similar (same horsepower) as the pumps in the Villages Shepard's Park Pump Station.
- Replacement of the existing 135kW generator in the LPS with a new 275kW Generator. For the purposes for this memorandum it is assumed that the new generator would need to be sited outside of the existing building as it is not clear at this time if the generator can be sited inside the building.

Cost and estimated sewer rate changes for example sewer users

The approximate cost of the project is estimated to be \$687,600.00. The cost includes a 20% project contingency and 20% to cover legal, technical, and administrative costs for the project. Certainly this estimate is subject to change as detailed design is advanced. A copy of the concept estimate is included in Attachment B.

To assist the Town in understanding how the project cost may affect a typical rate payer in the district we have presented the example changes for a \$250,000 single family home user below. It is important to note that we assumed that the Town would advance a bond for this work for a term of 20-years at a rate of 4%.

Existing

Average Assessed Units: 8
Sewer Debt Fee (per \$1K): \$0.491
Sewer O&M Fee (per unit): \$52.311

Caldwell Sewer Debt: \$122.75
Caldwell Sewer O&M: \$418.49
TOTAL SEWER FEE: \$541.24

Proposed

Average Assessed Units: 8
Sewer Debt Fee (per \$1K): \$0.491
Sewer O&M Fee (per unit): \$52.311

Caldwell Sewer Debt: \$200.42
Caldwell Sewer O&M: \$418.49
TOTAL SEWER FEE: \$618.91

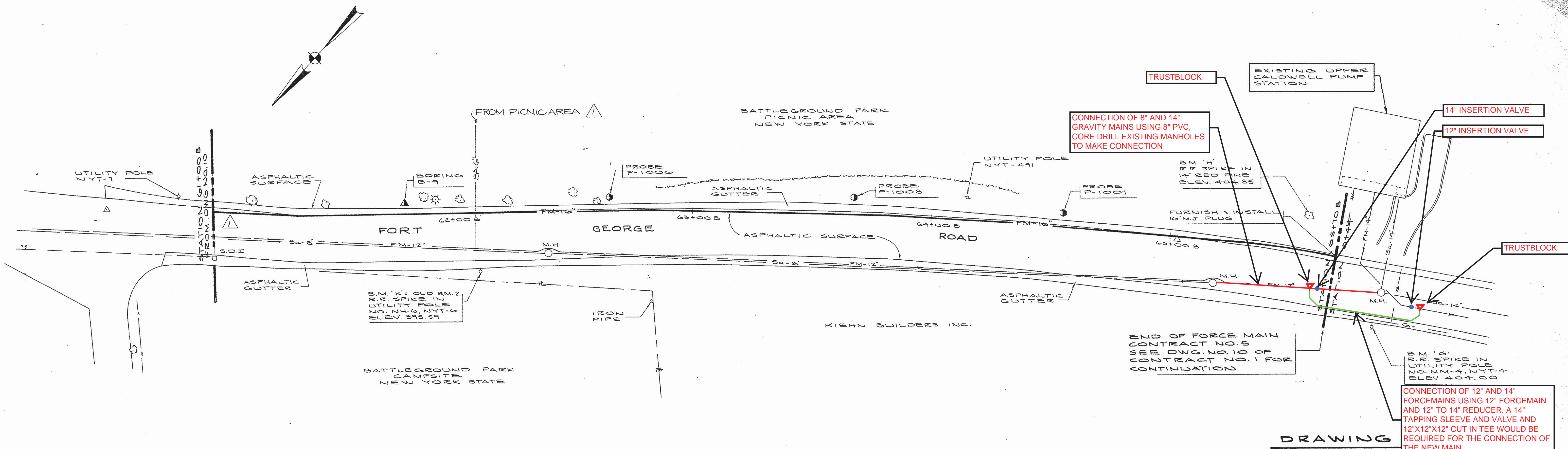
Based on the information provided above the average increase in sewer debt fee for a \$250,000 single family home would be approximately \$77 per year. It is noted however that this cost analysis does not take into account the reduction in O&M costs associated with the decommissioning of the UPS.

Important Project Notes and Considerations

- A full pump design analysis was not performed as part as developing this memorandum. A complete hydraulic model and study is required to be performed in order to design/select the final pumps to be used in the LPS.
- At the request of the Town, an electrical engineer was not engaged to assist with evaluating the electrical system abilities and required modifications to serve the new pumps at the LPS. The services of an electrical engineer will be needed to advance detailed design and project cost estimating.
- We recommend that the Town advance slip-lining as planned in the CSD, such that non-wastewater loads to the LPS are reduced.
- The information presented herein and the analysis preformed to produce the findings are conceptual in nature and are subject to change as detailed design and analysis is advanced.

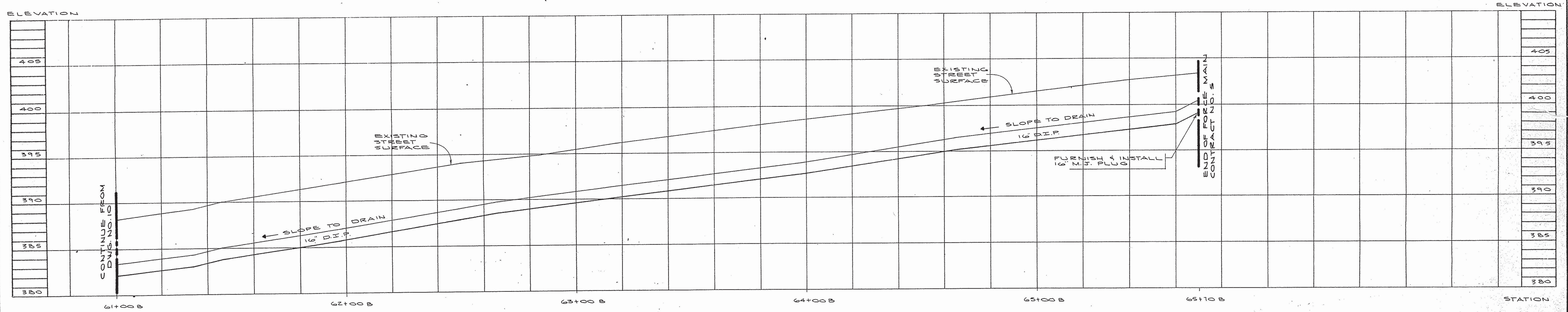
Closing

We hope you find this information useful. We would be glad to discuss our findings or any other information presented herein with you at any time. Feel free to contact our office at 824-1926 with any questions. It is our pleasure to serve the Town.



FORCE MAIN PLAN
SCALE: 1" = 20'

① REFER TO "GENERAL NOTES" ON DRAWING NO. 1 (CONTRACT NO. 5) PRIOR TO ANY CONSTRUCTION



LEGEND

- | | | | |
|-----------|--|---|-------------------------------|
| — 3'-6" — | SEWER, STORM | ○ | MANHOLE (M.H.) |
| — 3'-0" — | SEWER, SANITARY | ⊕ | FIRE HYDRANT |
| — FM-12 — | SANITARY FORCE MAIN - PROPOSED | □ | UTILITY POLE |
| — W-4" — | WATER MAIN | □ | STORM DRAINAGE INLET (S.O.I.) |
| — G-4" — | GAS | ○ | STREET LIGHTING POLE (L.P.) |
| — E — | ELECTRIC | ○ | METAL POLE (M.P.) |
| — T — | TELEPHONE | ○ | PARKING METER (P.M.) |
| — X — | UTILITY VALVE (GAS) | ○ | SIGN |
| — W — | WATER VALVE (W.V.), WATER SERVICE BOX (W.S.B.) | ○ | TREE |
| | | ⊗ | TREE STUMP |

PROFILE

SCALE: HORIZ. 1" = 20'
VERT. 1" = 5'

"AS-BUILT"

These "as-built" drawings are filed with each marked-up plan, drawings and site data furnished by the contractor to the Engineer. As the sole function of drawings in the preparation of these drawings is to show the location of all structures, utilities, and other features shown on the drawings, the Engineer is not responsible for the accuracy of the drawings. The contractor is responsible for the accuracy of the drawings and for the accuracy of the field notes and specifications. The contractor is responsible for the accuracy of the field notes and specifications.

"Alteration of this document, except by a licensed professional engineer, is illegal."

UNREVISED BY DATE "AS-BUILT" NO REVISION	PARTNER IN CHARGE LIC. 29869 RE-LS. 	VILLAGE OF LAKE GEORGE, NEW YORK SEWAGE TRANSMISSION FACILITIES C-36-968		DRAWN R.A.	CHECKED R.H.I.
		FORCE MAIN STATION 61+00B TO 65+70B		SCALE AS SHOWN	BOOK NO.
RIST - FROST, ASSOCIATES CONSULTING ENGINEERS GLENS FALLS • LACONIA • WATERTOWN NEW YORK • NEW HAMPSHIRE • NEW YORK		DATE JULY 1, 1976	PROJECT NO. 2463	DRAWING NO. 11	

ATTACHMENT B



Engineers
 Environmental Professionals
 Land Surveyors
 Landscape Architects
 Planners

North Country Office

375 Bay Road, Queensbury, NY 12804

P: (518) 812-0513 F: (518) 812-2205

www.chazencompanies.com

Dutchess County Office (845) 454-3980

Capital District Office (518) 273-0055

Village of Lake George				
Caldwell Sewer District Fort George Road Pump Station Consolidation				
Description	Units	Unit Cost	Qty	Cost
Site Preparation				
Mobilization	LS	\$18,300.00	1	\$18,300.00
Installation of Erosion & Sediment Control (E&SC)	LS	\$1,000.00	1	\$1,000.00
Maintenance and Protection of Traffic	LS	\$4,000.00	1	\$4,000.00
8" PVC Sewer Line	LF	\$70.00	100	\$7,000.00
12" DI Sewer Forcemain ¹	LF	\$120.00	100	\$12,000.00
12" to 14" DI Reducer	EA	\$2,500.00	1	\$2,500.00
12" Insertion Valve	EA	\$16,000.00	1	\$16,000.00
12"x12"x12" Cut-in Tee	EA	\$3,000.00	1	\$3,000.00
14" Insertion Valve	EA	\$26,000.00	1	\$26,000.00
14" Tapping Sleeve and Valve	EA	\$8,000.00	1	\$8,000.00
Core and Connect to Manholes	EA	\$2,000.00	2	\$4,000.00
Full Depth Asphalt Removal	SY	\$4.00	75	\$300.00
12" Ductile Iron Bypass Pumping Piping	LF	\$120.00	30	\$3,600.00
6" Ductile Iron Bypass Pumping Piping	LF	\$60.00	20	\$1,200.00
Bypass Pumping Piping Appurtenances	LS	\$3,000.00	1	\$3,000.00
6"x12" Reducer	EA	\$1,200.00	1	\$1,200.00
12"x12"x12" Wye	EA	\$3,000.00	1	\$3,000.00
12" Gate Valve	EA	\$4,700.00	2	\$9,400.00
Generac Generator (275 kW w/level 2 sound housing sub-base fuel tank)	EA	\$103,000.00	1	\$103,000.00
Remove and dispose of existing Generator from Lower PS	LF	\$10,000.00	1	\$10,000.00
72 HP Flygt Pumps (w/elbow inlet and t-stand)	EA	\$47,000.00	3	\$141,000.00
LPS Pump Piping Upgrades	LS	\$10,000.00	1	\$10,000.00
Concrete Pump Supports (including demo of existing)	LS	\$35,000.00	1	\$35,000.00
Pump Controls	EA	\$15,000.00	3	\$45,000.00
Septage Hauler Allowance	LS	\$5,000.00	1	\$5,000.00
Site Restoration	LS	\$10,000.00	1	\$10,000.00
Construction Subtotal				\$482,500.00
20% Contingency				\$96,500.00
Construction Total				\$579,000.00
20% Legal, Technical , and Administrative				\$115,800.00
TOTAL				\$694,800.00
Last updated 11/20/15				

Notes:

1. Quantity and price assumes there is no conflict between new 8" gravity main and existing/new 12" forcemain.