Water System Assessment

Project Information Meeting – August 11, 2015 | 6:00 pm
Introductions

- Gary D. Cannerelli, PE – O’Brien & Gere
- Stephen D. Delano, PE – O’Brien & Gere
- Jeffrey L. Overstrom – DANC
Agenda

- Project history
- Existing facilities
- Needs assessment
- Recommended improvements
- Project costs
- Funding strategy
- Next steps
- Questions
Project History
Project History

- DANC asset management plan – 2009
- O’Brien & Gere retained by Village – 2011
- Water system assessment report – 2012
- Further evaluation of water distribution system – 2014
- Updated water system assessment report – May 2015
Existing Facilities
Existing Facilities

- Source and Intake
- Low Lift Pumping Station
- Water Treatment Plant
- Standpipe
- Distribution System
Existing Facilities
Source and Intake

- 12-inch cast iron pipe extends 370 ft off Bartlett Point
- Timber crib and intake screen 50 ft deep
- Installed 1937
- Issues/concerns
  - Zebra mussels
  - Screen condition
Low Lift Pumping Station

- Three (3) 10-HP pumps lift water from river to Water Treatment Plant
- Originally constructed 1937; upgraded 1982
- Issues/concerns
  - Mechanical, electrical and instrumentation equipment at end of service life (30+ years old)
Low Lift Pumping Station (cont’d)

- Issues/concerns (cont’d)
  - No standby power
  - Control valves rebuilt many times
  - Controls outdated
  - Future reliability
Water Treatment Plant

- Rated capacity: 720,000 gal/day
- Diatomaceous earth (DE) filtration
- Chlorine gas disinfection

- Three (3) 30-HP pumps lift water from clearwell to standpipe and distribution system
- Originally constructed 1982; pumps replaced and additional clearwell storage added 1989
Water Treatment Plant (cont’d)

- Treatment performance and capacity adequate for future needs
- Issues/concerns
  - Mechanical, electrical and instrumentation equipment at end of service life (30+ years old)
  - Filters rebuilt several times (1996, 2006)
  - Internal corrosion/scaling of filters
Water Treatment Plant (cont’d)

- Issues/concerns (cont’d)
  - Pumps and valves rebuilt multiple times
  - Controls outdated, spare parts unavailable
  - Future reliability
Standpipe

- 1-MG nominal capacity, 42 ft dia. x 96 ft tall
- Constructed 1982; re-coated 1996
- Last inspected 2007
- Issues/concerns
  - Coating system repairs needed
  - Structural, safety and sanitary deficiencies
Standpipe (cont’d)

- Issues/concerns (cont’d)
  - Internal mixing system to maintain water quality and prevent freezing
Distribution System

- 1,066 service connections (1,025 in Village, 41 outside users)
- Over 16 miles of distribution piping
- 4- to 12-inch diameter; various pipe materials
- Oldest piping dates from early 1900s
- 39 outside users west of Village (Bartlett Point/Zenda Farms area)
  - Improvised/substandard piping network
  - No formal water district
Distribution System (cont’d)

- Issues/concerns
  - Main breaks
  - Inoperable or leaking valves and hydrants
  - Undersized mains
  - Internal scaling/corrosion
  - Dead ends
Distribution System (cont’d)

- Issues/concerns (cont’d)
  - Conflicts with sewer manholes
  - Violations of health department regulations
  - Less than recommended fire flow
Needs Assessment
Needs Assessment

▪ Reviewed and analyzed historical production quantity and quality data
▪ Supply and treatment capacity is adequate for projected needs
▪ “The water treatment plant technology and facilities are well suited to the water quality of the St. Lawrence River, and the system has demonstrated long-term compliance with applicable State and federal water treatment regulations. *There is no compelling reason to change treatment technology or to provide additional treatment processes.* . . .”
▪ “The vast majority of mechanical and electrical equipment, instrumentation and controls are of [early] 1980s vintage. *Instrumentation and controls are largely outdated, and the plant has . . . had difficulty obtaining replacement parts for some of this equipment.* Rehabilitation or replacement of much of this equipment is warranted and appropriate. This is supported by the 2009 DANC Asset Management Plan report.”
Needs Assessment – Alternatives Considered

- (A) No action
- (B) Abandon existing water supply and treatment system
- (C1) Rehabilitate existing water supply and treatment system using current treatment technology
- (C2) Rehabilitate existing water supply and treatment system usingalternate treatment technology
- (D) Expand and rehabilitate existing water supply and treatment system
Needs Assessment

- Alternative C1 recommended
  - A and B not viable long-term options
  - DE filtration well suited to St. Lawrence River source water; has performed well for over 30 years
  - No compelling reason to change to alternate technology (such as membrane filtration)
  - No immediate plans to extend service beyond current customers – capacity expansion not warranted
Needs Assessment

▪ Replace or rehabilitate old mechanical and electrical equipment, and controls
▪ Improve system reliability/reduce risk of equipment failure
▪ Enhance operational flexibility
▪ Improve system control and monitoring capability
Recommended Improvements
Recommended Improvements

- Source and Intake
- Low Lift Pumping Station
- Water Treatment Plant
- Standpipe
- Distribution System
Recommended Improvements - Source and Intake

- Repair/replace intake screen
- Add chemical feed system to control zebra mussels
Recommended Improvements - Low Lift Pumping Station

- Replace/rehabilitate pumps, motors and control valves (x3)
- Replace/rehabilitate surge relief valve
- Replace/upgrade MCC
- Replace instrumentation panel
- Provide new standby generator and transfer switch
- Miscellaneous architectural and security improvements/rehabilitation (windows, doors, painting, etc.)
- Related electrical, HVAC and plumbing work
Recommended Improvements - Water Treatment Plant

- Replace/rehabilitate DE filters and associated valves and actuators
- Replace/rehabilitate high lift pumps, motors and control valves (x3)
- Replace or rehabilitate surge relief valve
- Replace/upgrade MCC
- Replace filter control panels and main instrumentation panel
- Replace/upgrade instrumentation and controls
Recommended Improvements - Water Treatment Plant (cont’d)

- Consider change from chlorine gas to sodium hypochlorite
- Improve water quality monitoring and chlorine feed rate control
- Abandon septic system and connect to sanitary sewer
- Replace exterior doors
- Miscellaneous architectural and security improvements/rehabilitation (windows, doors, painting, etc.)
- Related electrical, HVAC and plumbing work
Recommended Improvements - Standpipe

(Pending findings of upcoming inspection)

▪ Rehabilitate interior and exterior coatings
▪ Remove cathodic protection system
▪ Repair vent
▪ Repair foundation concrete deterioration
▪ Provide fall protection on upper ladder
▪ Provide mixing system
Recommended Improvements - Distribution System

- Replace old piping in James St (prior to NYSDOT road reconstruction/resurfacing)
- Replace 4-inch and smaller mains
- Eliminate hydraulic restrictions
- Replace “old” mains
- Eliminate dead ends
Recommended Improvements - Distribution System (cont’d)

- Replace and upgrade piping to outside Town users (Bartlett Point/Zenda Farms area)
- Relocate water mains from sanitary manholes
- Provide water service to Clayton Marina
Recommended Improvements - Distribution System (cont’d)
## Project Costs

<table>
<thead>
<tr>
<th>Construction Costs (including contingency allowance and escalation)</th>
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<tbody>
<tr>
<td>Low Lift Pumping Station Upgrades</td>
<td>$ 400,000</td>
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<tr>
<td>Water Treatment Plant Upgrades</td>
<td>$ 1,430,000</td>
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<tr>
<td>1-MG Standpipe Upgrades</td>
<td>$ 330,000</td>
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<tr>
<td>Distribution System Improvements(^2)</td>
<td>$ 3,000,000</td>
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<tr>
<td><strong>Total Estimated Construction Cost(^1)</strong></td>
<td><strong>$ 5,160,000</strong></td>
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<tr>
<td>Engineering, Legal and Administrative Fees</td>
<td>$ 1,030,000</td>
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<tr>
<td><strong>Total Estimated Project Cost</strong></td>
<td><strong>$ 6,190,000</strong></td>
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\(^1\)Costs are as of May 2015 (ENR CCI = 9975.48). Additional escalation through anticipated midpoint of construction should be added.

\(^2\)Cost for Distribution System improvements is an allowance. Cost does not include all proposed improvements identified in May 2015 Water Distribution System Evaluation report.
Funding Strategy
Funding Strategy

- Likely sources
  - NYSEFC/Drinking Water State Revolving Fund
    - MHI (Village) – $43,594 (2010 Census)
    - TSC – $517/EDU
  - USDA/RD Water and Environment Program
    - TAC – ±$565/EDU
  - NYSEFC/Water Grant Program (Water Infrastructure Improvement Act of 2015)
Funding Strategy

- Preliminary analysis of project viability
- Demonstration of need to funding agencies
- Impact on water rates of $6.19 million project
  - 1346.25 water EDUs (Village and Town)
  - Current annual water service charge – $455/EDU
  - NYS A&C max. annual cost – $862/EDU (affordable rate criteria)
  - “Worst” case (no assistance) – $750/EDU
  - “Best” case ($2.5 million grant, 0% NYSEFC loan) – $528/EDU
Next Steps
Next Steps

▪ Complete environmental review (SEQR/SERP) – 8/2015
▪ Submit application for NYS Water Grant Program – due 9/4/2015
▪ Submit application for USDA/RD funding assistance – fall 2015
▪ Perform preliminary and final design – fall/winter 2015
▪ District formation – after funding package determined

Demonstrate project readiness to funding agencies

“Maximize potential to minimize user costs”
Questions?