Amendment No. 2: +2.4 MGD Phase 2

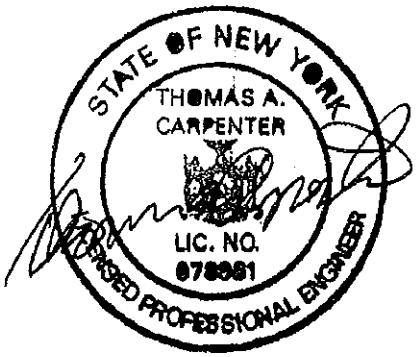
To The

Engineering Report

For

Genesee County Water Supply Program

March 2018



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Introduction & Background

In January 2000, Clark Patterson Associates (now Clark Patterson Lee) prepared the *"Engineering Report for Genesee County Water Supply Program"* for Genesee County. For this study, the original report will be referred to as the "Engineering Report".

Changes to the project during construction of Phase 1 resulted in the preparation of Amendment No. 1 to the Engineering Report in April 2006. The Amendment provided a brief review of the original project and a more detailed description of the project to-date along with supplemental information related to projects that have benefited from the Genesee County Water Supply Program.

The Water Supply Program has spurred many local municipal water projects since 2006. There are several large projects currently in the planning and construction stages that will add many new water users by the end of 2019. 2016 was a very dry year and the Genesee County Water System was operating at its supply capacity. The dry year also increased public demands for public water in areas that were not yet served.

By 2016, it became apparent that the County could likely be in a water supply shortage by approximately 2019. In late December 2017, Genesee County commissioned a feasibility study with Clark Patterson Lee for Phase IIA Water System Master Planning efforts. The primary goal of this feasibility study, or "Master Plan" update as it is often referred to, was to evaluate the technical and financial feasibility of increasing the overall water supply throughout the County from 2.5 MGD to 3.0 MGD immediately. This would allow implementation efforts to be delayed and more carefully planned for the full 10 MGD Phase 2 project, which is not believed to be financially feasible at this time.

The County's goal is to provide water supply adequate for County wide needs and opportunities. County water system stakeholders have deemed it imperative that "Water Pay For Water". Meaning, water revenues need to cover the costs for required and desired water system improvements.

Original & Amended Phase 1 Project

The original water supply strategy involved the coordination and integration of County resources with the regional water supply systems of the Monroe County Water Authority (MCWA) and the Erie County Water Authority (ECWA) along with continued long-term use of the Village of LeRoy Water Treatment Plant and short-term use of the City of Batavia Water Treatment Plant (with "maintenance enhancements").

The project was to be divided into two (2) phases with Phase 1 of the County's water supply strategy involving the construction of approximately 34 miles of water main in Genesee, Monroe, and Erie Counties along with three (3) pump stations and three (3) water storage tanks.

Several modifications and additions were completed that expanded the overall scope of the intended Phase 1 project. The most notable change included the abandonment of the Village of LeRoy Water Treatment Plant and the full connection of the Village of LeRoy system to the MCWA. The Phase 1 project renovated the City of Batavia Water Treatment Plant to meet the

requirements of the United States Environmental Protection Agency Stage 2 Disinfection By-Products Rule and the Long Term 2 Enhanced Surface Water Treatment Rule.

The Phase 1 project resulted in the formation of several town water districts by 2006 and would result in many more town water districts in the coming years.

Appendix A: Original Engineering Report Figures & Tables in 2000 includes figures that show the Phase 1 and Phase 2 subprojects. Page 2-5 and Table 2-2 show the Future Water Demand projects in 2000. Page 9-3 and Table 9-1 show the estimated Project Costs for Phase 1 & 2. In 2000, Phase 1 had an estimated cost of $21.0M, with $4.7M occurring in Monroe County and $16.3M occurring in Genesee County.

The overall supply capacity after Phase 1 would be 8.68 MGD.

1. City of Batavia WTP	6.0 MGD
2. MCWA (North Road Pump Station)	1.0 MGD
3. ECWA (Pembroke Route 5)	1.5 MGD
4. Corfu WTP	0.18 MGD
Total Supply	8.68 MGD

Original Phase 2 Project

Phase 2 of the original project included an additional connection to the MCWA system in Chili, as well as system extensions in Genesee County to the Village of Elba, Village of Alexander, Town of Bethany, and Town of Alabama and possible "interconnection" of system transmission lines. Phase 2 included a second supply source for the City of Batavia and the Village of LeRoy (by the additional connection to the MCWA) to enable their entire (or partial) supply to be from MCWA as desired/appropriate.

As noted in the previous section, Phase 1 was modified during construction to connect the Village of LeRoy directly to MCWA and close the Village's Water Treatment Plant.

Appendix A: Original Engineering Report Figures & Tables in 2000 includes figures that show the Phase 2 subprojects. Page 9-3 and Table 9-1 show the estimated Project Costs for Phase 2. In 2000, Phase 2 had an estimated cost of $29.0M, with $11.0M occurring in Monroe County and $18.0M occurring in Genesee County.

The overall supply capacity after Phase 2 would be 9.68 MGD

1. Closed City of Batavia WTP	0.0 MGD
2. MCWA (North Road Pump Station)	1.0 MGD
3. Phase 2 MCWA Increase (North Road Pump Station)	7.0 MGD
4. ECWA (Pembroke Route 5)	1.5 MGD
5. Corfu WTP	0.18 MGD
Total Supply	9.68 MGD

Since the original Engineering Report was prepared, the infrastructure requirements and estimated cost for the original Phase 2 project have escalated significantly. As shown in Appendix B: Original Phase 2 Figure & Estimate in 2012, the estimated costs for MCWA infrastructure had

risen to $20.55M M by 2012. As shown in Appendix C: Original Phase 2 Figure and Estimate in 2016, the estimated costs for MCWA requested infrastructure had risen to $60.47M (with $9.76M of storage Batavia/Oakfield area) by 2016.

Phase 2A Project (Renamed Phase 2)

By 2016, it became apparent that the County would need to implement a water supply project very quickly in order to avoid a projected water supply deficit by approximately 2019. It was also apparent that in order for Water to Pay For Water, a smaller project or phase of less financial magnitude would need to be implemented.

Initially, this project was to be called Phase 2A and provide approximately 2.5 to 3.0 MGD. In order to reduce nomenclature confusion, project stakeholders agreed that the current project under consideration for immediate implementation should be called Phase 2. The next future project would then be called Phase 3.

This strategy would allow implementation efforts to be delayed and more carefully planned for the much larger Phase 3 project, which is not believed to be financially feasible at this time. It would also allow time to pursue outside grants and funding sources.

Water Supply Needs

Town System Buildout

Since Phase 1 construction was completed, there have been a significant number of Town and Village water system projects completed. There are also many planned water projects that will be completed by approximately the end of 2019, adding to the strain on water supply. The Appendix D: New Phase 2 Study - Phase 2 & Phase 3 Improvements figure shows the current Existing Water System throughout the County in green and the Town 2-3 Year Improvements projects are shown in red. Some Town Near Future Improvements are shown in orange.

There are areas on the map not currently showing planned projects, particularly in the southern part of the County. However, some projects are in the early planning stages in these areas. Especially after the drought conditions in 2016, there seems to be an almost County wide desire for public water. If affordable water projects can be developed in these areas, it's possible that water mains could be installed on 90% or more of County roads by approximately 2030.

Water Interest

Residential demand for public water is very high, especially after the 2016 drought conditions. At this time, many residents were forced to haul water since their wells ran dry. There are economic development opportunities in many of the towns that are dependent on available water supply. In the past few years, the interest and demand from agricultural businesses within the County has increased substantially, particularly with the dairy farms which can increase their milk production with good water supply.

City of Batavia Water Treatment Plant Supply

In 2016, the City of Batavia Water Treatment Plant (WTP) daily treatment capacity during the dry summer dropped to approximately 4.5 MGD from its permitted capacity of 6.0 MGD. This was due to drought conditions and one of the groundwater supply wells requiring rehabilitation.

Even though the well has been repaired and water supply sources have recovered, County water stakeholders have agreed that 4.5 MGD should be used for the City's WTP capacity planning purposes since similar conditions could be experienced in the future.

The original Phase 2 project included closing the City's WTP. However, it has been determined that in order for Water to Pay For Water, the WTP needs to remain a supply source for at least the new Phase 2 project. Closing of the WTP as part of a Phase 3 project should be evaluated in more detail with a future Phase 3 evaluation.

Daily Water Demands (Usage)

County water use records for the very dry year of 2016 were used to develop overall County water use projections as well as a breakdown of water use by municipality. It is important to understand the overall water demands and how the demands are spread out across the County to allow for proper development of both water supply to the County and water distribution infrastructure throughout the County.

It is also important to understand that the water system infrastructure needs to be designed and constructed to meet Maximum Day Demands, but the water revenues generated are based on Average Day Demands. There needs to be a firm understanding of current and projected future water revenues. In order for Water to Pay For Water, there needs to be a balance between desired system capacity and the required infrastructure costs. Consideration of these factors will help optimize the Phase 2 project and provide an up to date 2017-2018 view of the Phase 3 project.

Based on the original Engineering Report, in 2000 the Average Day and Maximum Day Demands were 5.01 MGD and 7.52 MGD respectively, with a Peaking Factor of 1.5. The estimates for the year 2020 were 6.66 MGD average day and 9.01 MGD maximum day, with a Peaking Factor of 1.35.

Based on this current study, in 2017 the Average Day and Maximum Day Demands were 5.53 MGD and 8.66 MGD respectively, with a Peaking Factor of 1.56. The estimates for Phase 2 demands (end year 2019 into 2020) are 6.53 MGD Average Day and 9.79 MGD Maximum Day, with a Peaking Factor of 1.50. See Appendix D: New Phase 2 Study - Forecasted Demands spreadsheet and Maximum Day Demands spreadsheet. The current Phase 2 (year 2019 to 2020) demand estimates are very similar to the estimates in the original Engineering Report.

However, in the current study, the potential Phase 3 demands are 10.13 MGD Average Day and 15.19 MGD Maximum Day, with a Peaking Factor of 1.50. The potential Phase 3 (in year 2030 to 2040) demands exceed the demands and capacity needs that were contemplated in the original 2000 Engineering Report. This is reasonable given 18 years have passed and water infrastructure and usage have increased overtime.

The full supply capacity of the project recommended in the original Engineering Report would have been 9.68 MGD and the City of Batavia WTP would have been closed. The current proposed +2.4 MGD Phase 2 project will maintain the City's WTP and provide 11.08 MGD supply

capacity. However, it is now evident that the County could easily require 15 MGD in the foreseeable future.

Longer range future demands (year 2040 and beyond) are estimated at 14.73 MGD Average Day and 24.05 MGD Maximum Day, with a Peaking Factor of 1.72. Any analysis of the demands and infrastructure required to supply them is beyond the scope of this study. It is likely not worth evaluating demands that may be more than 20 years away until a Phase 3 project is well underway and it becomes evident that the Phase 3 supply capacities will be exceeded.

Supply Source Capacities

The Genesee County Water System is supplied from several sources to meet demands throughout the County. This study considered various different supply phases from existing and possible new sources to address the demands by phase. See Appendix D: New Phase 2 Study - Supply Source Capacities figure, Maximum Day Demands spreadsheet and Forecasted Demands spreadsheet.

The Genesee County Water System is currently supplied from:

1.	City of Batavia WTP	4.5 MGD
2.	MCWA (North Road Pump Station)	2.5 MGD
3.	ECWA (Pembroke Route 5)	1.5 MGD
4.	Corfu WTP	0.18 MGD
	Total Current Supply	8.68 MGD

Note: MCWA increased the pumping capacity of the North Road Pump Station from 1.0 MGD to 2.5 MGD in recent years.

Based on the estimated Phase 2 Maximum Day Demands (end year 2019 into 2020) of 9.79 MGD, the County Water System will be in supply deficit of approximately 1.11 MGD by approximately 2020. Therefore, it is imperative to implement the proposed Phase 2 project to provide another 2.4 MGD of supply from MCWA at the North Road Pump Station. This will increase the Total Supply to 11.08 MGD which will provide some excess capacity beyond the Phase 2 Maximum Demand of 9.79.

1.	City of Batavia WTP	4.5 MGD
2.	MCWA (North Road Pump Station)	2.5 MGD
3.	Phase 2 MCWA Increase (North Road Pump Station)	2.4 MGD
4.	ECWA (Pembroke Route 5)	1.5 MGD
5.	Corfu WTP	0.18 MGD
	Total Supply	11.08 MGD

In order to meet Phase 3 Maximum Day Demands in the future and to offset closing of the City of Batavia WTP, the Phase 3 project should provide another 8.5 MGD of supply through the North Road Pump Station (or other east side connections) beyond the Phase 2 project supply increase. Phase 3 should also include a supply increase of up to 2.5 MGD on the west side from the ECWA Route 5 connection. This will increase the Total Supply to 17.58 MGD which will provide some excess capacity beyond the Phase 3 Maximum Demand of 15.19 MGD.

1.	Closed City of Batavia WTP	0.0 MGD
2.	MCWA (North Road Pump Station)	2.5 MGD
3.	Phase 2 MCWA Increase (North Road Pump Station)	2.4 MGD
4.	Phase 3 Upland Supply or MCWA Increase	8.5 MGD
5.	ECWA (Pembroke Route 5)	1.5 MGD
6.	Phase 3 ECWA Increase (Pembroke Route 5)	2.5 MGD
7.	Corfu WTP	0.18 MGD
	Total Supply	17.58 MGD

Alternatives Considered

Evaluation of alternatives placed heavy emphasis on the Water Pay For Water goal. This requires a phased plan because Phase 3 capacity levels are not affordable based on current Average Day Demand revenues. The analysis was broken into Supply (to the County and City Batavia WTP Update) and Distribution (throughout the County). See Appendix D: New Phase 2 Study - Phase 2 & Phase 3 Improvements figure and Preliminary Cost Estimate spreadsheet.

In 2000, the strategy for increased water supply and transmission involved closing the City of Batavia WTP and replacing that supply with additional MCWA water. Water would then be transmitted radially out from the City of Batavia. The County can now be divided into roughly thirds (north to south) for technical system evaluation. Elevations, on average, increase as you travel north to south across the County and are relatively equal as you travel east to west. Water system pressure zones reflect this along with development of the County water system.

The middle of the County includes the City & Town of Batavia, Village & Town of LeRoy, Town of Stafford, Town of Pembroke, and Village of Corfu. This is where the majority of the existing water supply system was developed previously and was the focus of the original Phase I project. This area is more densely populated, which helps makes water systems more affordable on a unit basis (a residential house is one unit).

As water has expanded in the northern third of the County, other potential transmission routes have developed that don't require water supply going through the City and/or Town of Batavia.

Higher elevations in the southern third of the County require booster pump stations and storage tanks. These expensive infrastructure items, along with less dense population, make it much more expensive to service this area (on a unit basis) than the middle and northern portions of the County. These are some of the reasons that water system development has been slower in this area.

Technical and financial feasibility were analyzed for several alternatives at several different capacity levels to optimize Phase 2 and Phase 3 supply capacities and infrastructure costs. The specific additional east side supply capacities that were analyzed included 2.4 MGD, 3.0 MGD, 6 MGD, and approximately 10 to 11 MGD. See below ECWA section discussion which relates to west side supply capacity. See Appendix D: New Phase 2 Study - Preliminary Cost Estimate spreadsheet and Revenue Projections spreadsheet.

Supply Sources
Several existing and new supply sources and locations were considered, in two phases.

City of Batavia Water Treatment Plant
The City of Batavia Water Treatment Plant will need to remain in service at least until Phase 3 can be implemented. This may be another 5 to 10 years. Therefore, a modest update project with an estimated cost of $2.5M should be included in the Phase 2 project.

Rebuilding the City's WTP was considered as a Phase 3 alternative. The City has completed a study of rebuilding and expanding the WTP capacity up to 8.0 MGD. The estimated cost for this level of improvement would be $36.4M. This is not viewed as a highly viable alternative since the sources of the WTP, Tonawanda Creek, and groundwater wells are at risk supply sources and several other entities are withdrawing groundwater near the City's well fields.

MCWA Supply
The long-term two phase plan described in the original Engineering Report was to close the City of Batavia WTP and develop an 8 MGD supply from MCWA extending from Gates through the North Road Pump Station in LeRoy (which currently supplies 2.5 MGD). In 2000, the estimated costs were $11M. Since that time, MCWA has determined that additional improvements would be required for this alternative and estimated costs have escalated. In 2012 the estimated costs were $20.55M. In 2016, the estimated costs for MCWA requested infrastructure were $60.47M (with $9.76M of storage Batavia/Oakfield area).

In 2017, it was determined that supply capacity from this source would need to be at least an additional 10.0 MGD, for a total of 12.5 MGD (2.5 MGD current + 2.4 MGD Phase 2 + 7.6 MGD Phase 3 = 12.5 MGD) through the North Road Pump Station (or other east side connections) to meet the Phase 3 demands. Costs for this Phase 3 alternative are estimated at $57M.

A significant amount of the infrastructure required for this Phase 3 alternative would require construction in very densely populated areas in Chili and Gates. Several crossings of railroads, Route 490, and Route 390 would be required. Construction would be difficult, time consuming, and expensive.

In order to meet the Phase 2 demands, an additional 2.4 MGD of supply would be required through the North Road Pump Station, for a total of 4.9 MGD (2.5 MGD current + 2.4 MGD Phase 2). This alternative is estimated to cost $13.54M and is the only alternative examined that could meet the desired 2019- 2020 timeline to meet the Phase 2 demands. Therefore, this is the preferred Phase 2 alternative.

Uplands Supply
This Phase 3 alternative would provide a different option to increase supply through the North Road Pump Station by 7.0 MGD for $31.36M or 10.0 MGD for $37.56M. The route would require construction though Wheatland and Rush. Although some areas are densely populated, the majority of the route would be through sparsely populated areas. Construction would be easier and far less expensive than the Gates supply alternative. This alternative would need to be care-

fully examined with MCWA and other stake holders before it is considered a viable or preferred Phase 3 alternative.

Shoremont/Lake Ontario Supply
This Phase 3 alternative would provide a different option to increase supply through the North Road Pump Station by 7.6 MGD for $59.7M. The route would require construction though urban areas in Gates and Greece to upsize transmission mains and pump stations. These areas are densely populated which will effect land acquisitions and construction costs. Construction would be more expensive than the Uplands Supply route.

ECWA Supply
ECWA was contacted early in the study. However, no meaningful ECWA input was obtained by late 2017 when the County began moving forward with Phase 2 design and permitting efforts.

Based on preliminary discussions with ECWA in early 2018, the most feasible west side supply increase would be a pumping and transmission main project along Route 5 from the Clarence/Newstead Town Line to essentially the Newstead/Pembroke Town Line. This project would increase ECWA supply in Pembroke along Route 5 by 2.5 MGD to 4.0 MGD with an estimated cost of $11.8M. See Appendix F: ECWA Route 5 Supply – Location Map figure, ECWA Route 5 Supply figure & Cost Estimate Summary spreadsheet.

Due to the delay in obtaining ECWA supply information, this subproject was not included in the Phase 2 project budget estimates for immediate implementation. However, it is being included with the Phase 2 SEQR (State Environmental Quality Review) in case it needs to be implemented before a Phase 3 project, if west side demands increase. This subproject could be implemented as a stand-alone project, as it is completely independent from the east side supply alternatives.

Hydraulics
MCWA performed substantial conceptual level hydraulic analysis for the Phase 2 & east side Phase 3 supply alternatives with Clark Patterson Lee coordination for this study. Detailed hydraulic analysis will be required for each Phase 2 or Phase 3 subproject during the design and approval processes. Many of the Phase 2 subprojects within Genesee County involve the County providing partial funding for town projects. The towns will perform detailed hydraulic analysis during design of their projects in order to obtain Department of Health and MCWA approvals.

Water Age & Quality
Water age and quality can be a challenge at times at the extremities of the County system, particularly in warm weather. Water coming in from MCWA or ECWA has already traveled a substantial distance and has aged. Chlorine residuals can be very low and THM (Trihalomethanes) disinfection biproduct levels can be high. Often the only solution is flushing water.

Future water quality levels are difficult to calculate accurately since there is so much variance in existing water quality levels and so many water projects throughout the County that will be completed in 2019 or 2020. These projects will increase water usage at the County system extremities which will have a positive impact on water age and quality. However, the projects

will also extend the length of the extremities. Therefore, the Phase 2 project will include funding for adding THM spray removal systems at water storage tanks and chlorine booster stations at water storage tank sites or at other strategic locations to improve water quality. Funding will be provided by the County to the local municipalities to plan, design, and install these items.

Water quality operations such as flushing, chlorinating, and THM removal operations and the associated costs are a much heavier burden for municipalities at the ends of County system extremities. There are also multiple water system operators throughout the County. This makes addressing water quality far more difficult than if a single operator was responsible for all water quality operations and the operational expenses were spread out evenly County wide.

Water Storage

The Current, Phase 2 and Phase 3 water storage tanks and capacities are shown on the Appendix D: New Phase 2 Study - Storage Map figure. The water storage goal is to provide at least one day storage of the County's total supply capacity. The storage should be spread out across the County in order to provide supply redundancy and meet fire flow requirements throughout the County. Since several local municipalities are currently planning storage tank projects, the best Phase 2 storage strategy is to provide County funding to increase the size of these tank projects or to help make the local projects affordable (on unit cost basis) so they move forward. These include projects in the Towns of Elba, Bethany, and Darien/Alexander. Pavilion and MCWA are working together on a tank project as well. Phase 3 includes tank projects in LeRoy to supply the North Road Pump Station, Pembroke or Alabama and Alexander. These projects might be fully funded by the County in the future, but funding opportunities including working jointly with the local municipalities to maximize grant opportunities should be explored.

Recommended +2.4 MGD Phase 2 Project

It was determined that all Phase 3 alternatives were too expensive for Water to Pay For Water.

It was also determined that for additional MCWA water supply through the North Road Pump Station, +2.4 MGD is the threshold at which infrastructure requirements and costs increase dramatically.

The +2.4 MGD Phase 2 alternative is the only alternative examined that could meet the desired 2019 - 2020 timeline to meet the Phase 2 demands. It meets the Water Pay For Water criteria. Implementation would not eliminate any of the Phase 3 alternatives examined. Therefore, it is recommended that the +2.4 MGD Phase 2 MCWA North Road Pump Station alternative be implemented as soon as is practical.

Scope of Work & Estimated Costs

The proposed +2.4 MGD Phase 2 project is estimated to cost $30.0M. It is detailed in the Appendix D: New Phase 2 Study - Phase 2 & Phase 3 Improvements figure and Preliminary Cost Estimate spreadsheet. The subprojects are described in detail in the Appendix E: New Phase 2 SEQR Scope of Work narrative.

Please note the ECWA Route 5 supply improvements are included in the SEQR Scope of Work but not in the following Implementation Scope of Work that summarizes the subprojects that should be budgeted and considered for immediate implementation:

+2.4 MGD Phase 2 Project	
MCWA Supply Subprojects	$13.54M
Genesee County Distribution Subprojects	$13.96M
Batavia Water Treatment Plant Improvements	$2.50M
Phase 2 Total	**$30.00M**

MCWA Supply Subprojects
1B: North Road Water Main (3" domestic)
2A/2B/2C: Caledonia-Mumford Pump Station & Water Main (New)
4A: Chestnut Ridge Water Main (24")
5: Churchville/Bergen Pump Station (New)
6A1: Vallance Road Water Main (16")
6B: North Road Pump Station (Upgrades)
7A: Golden Road Pump Station (New)
10A: Scottsville Road Pump Station (Upgrades)
10B: Riga Pump Station (Upgrades)
10C: Morgan Road Pump Station (Upgrades)

Genesee County Distribution Subprojects
G1: Town of Elba - Tank Upgrades
G2: Village of Oakfield - Tank Upgrades
G3: Stafford/Elba Transmission Main – Town of Elba (portion)
G4: Stafford/Elba Transmission Main – Town of Batavia (portion)
G5: Stafford/Elba Transmission Main – Town of Stafford (portion)
G6: Prole Road Water Main - Town of Stafford
G7: Town of Pavilion - Tank Upgrades
G8: Town of Byron Pump Station (New)
G9 & G10: Town of Byron – NYS Route 262 WM Upsize
G11: Town of Darien/Alexander – Water System Contribution
G12: Town of Bethany – Water System Contribution
G14: Town of Stafford – Temperance Hill Tank Upgrades

Batavia Water Treatment Plant Improvements
G15: City of Batavia – Water Treatment Plant Improvements Contribution

Implementation & Schedule:
Phase 2 SEQR (State Environmental Quality Review) and design and permitting efforts began in late 2017. This would hopefully allow for some bidding and construction to begin in 2018 and construction to be complete or nearly complete by the end of 2019.

The MCWA Supply subprojects will provide another 2.4 MGD from Monroe County through the North Road Pump Station. Design and implementation of these subprojects has been given a

high priority since providing additional water supply capacity to the County has reached a critical junction.

The Genesee County Distribution subprojects and Batavia Water Treatment Plant Improvements are less critical from a supply capacity timing perspective. However, most of these subprojects involve funding contributions for local projects, some of which are nearing bidding and construction phases. Therefore, Genesee County should secure funding for these subprojects and develop IMAs (Inter-Municipal Agreements) with the appropriate municipalities as soon as practical to avoid any possible delays to the local projects.

Financial Considerations & Funding Opportunities

The County will perform a separate more detailed financial and Surcharge analysis beyond the scope of this study. This study does provide some financial analysis in order to understand the magnitude of a Phase 2 project that will meet the Water Pay For Water criteria. It is important to remember that water revenues are generated based on the current Average Day Demands. However, the system needs to be designed and constructed based on infrastructure capacity needed to meet the Maximum Day Demands. See Appendix D: New Phase 2 Study - Revenue Projections spreadsheet.

The current County Water Surcharge is $0.60/1000 gallons. The current average daily demand is 5.38 MGD. At these levels, the County typically has a Fund Balance of approximately $350,000/yr. The County has a Reserve of $2.00M that can be applied to the project along with $1.30M in remaining GCEDC (Genesee County Economic Development Center) Community Benefit Agreement funds. A project of approximately $9.35M could be implemented with these funds.

The County will increase the Surcharge in order to address the critical need for a capacity increase and still have Water Pay For Water. If the Surcharge was increased by $0.60/1000 gallons (to $1.20/1000 gallons total), a project of approximately $30.31M could be implemented. If the Surcharge was increased by $0.90/1000 gallons (to $1.50/1000 gallons total), a project of approximately $40.79M could be implemented. Therefore, a Surcharge increase of at least $0.60/1000 gallons would be required to implement the proposed +2.4 MGD Phase 2 project outlined in this study.

If the Surcharge was increased by more than $0.60/1000 gallons, reserve funding could be generated for a future Phase 3 project. As additional Average Day Demands increase, the water revenue generated will also increase, creating additional reserve funding for future water projects. However, as the Phase 3 infrastructure costs are $50.0M to $60.0M, the Surcharge and Average Day Demands will need to increase substantially for Water to Pay For Water for a Phase 3 project.

The County will evaluate grant and financing opportunities for Phase 3, including USDA Rural Development and NYS Environmental Facilities programs. There is not adequate time to pursue these funding sources for Phase 2 and it is unlikely that the County would be successful in obtaining Phase 2 grants.

Many of the local municipal projects are eligible for grants and financing through USDA Rural Development and NYS Environmental Facilities programs. Therefore, in order to reduce costs for Countywide water users, it would be prudent to let the local municipalities pursue these funding sources for their projects. Then the County could provide "grant" contributions to make larger local projects more affordable. The current affordability threshold is approximately $1,000/yr/house (annual debt service plus water purchase) for most recent town projects throughout the County.

Conclusions and Recommendations

The primary goal of the Genesee County Water Supply Program is to provide adequate water supply capacity and quality to meet the County wide water needs and opportunities. County water system stakeholders have deemed it imperative that "Water Pay for Water".

The Water Supply Program has spurred many local municipal water projects. There are many projects currently in the planning and construction stages and the County is facing a potential water supply shortage. Immediate steps must be taken to increase supply capacity or a moratorium on water system projects may need to be considered.

It is recommended that the +2.4 MGD Phase 2 alternative be implemented as soon as is practical to avoid a water supply deficit in 2019 – 2020. It meets the "Water Pay for Water" criteria. Implementation does not eliminate the need for further Phase 3 investments in the future, nor does it duplicate effort.

The Implementation Scope of Work is summarized as follows:

+2.4 MGD Phase 2 MCWA North Road Pump Station	
MCWA Supply Subprojects	$13.54M
Genesee County Distribution Subprojects	$13.96M
Batavia Water Treatment Plant Improvements	$2.50M
Phase 2 Total	**$30.00M**

Following the Phase 2 project, the Total Supply of 11.08 MGD will exceed the estimated Maximum Day Demands of 9.79 MGD. The County supply source capacities will then be:

1. City of Batavia WTP	4.5 MGD
2. MCWA (North Road Pump Station)	2.5 MGD
3. Phase 2 MCWA Increase (North Road Pump Station)	2.4 MGD
4. ECWA (Pembroke Route 5)	1.5 MGD
5. Corfu WTP	0.18 MGD
Total Supply	11.08 MGD

Phase 2 MCWA Supply Subprojects within Monroe County should be highest priority in order to provide additional supply into the County as soon as possible.

The Genesee County Distribution Subprojects and Batavia Water Treatment Plant Improvements are less critical from a supply capacity timing perspective. However, most of these subprojects involve funding contributions for local projects, some of which are nearing bidding and construction phases. Therefore, Genesee County should secure funding for these subprojects and develop IMAs (Inter-Municipal Agreements) with the appropriate municipalities as soon as practical to avoid any possible delays to the local projects.

A Surcharge increase of at least $0.60/1000 gallons should be implemented to cover the proposed +2.4 MGD Phase 2 project's $30.0M cost. The County should also increase the Surcharge by an additional $0.60/1000 gallons to begin developing reserve funding for the Phase 3 project.

The County should continue to provide funding to expand strategic local municipal projects and help make them affordable. The local municipalities should also continue to seek outside grant and low interest financing sources. This strategy maximizes potential funding and the number of users that can be provided affordable public water.

The County should continue to evaluate obtaining additional ECWA Route 5 supply capacity, in parallel with the Phase 2 implementation efforts. This is a stand-alone project that could be implemented as needed if it is determined to be technically and financially feasible.

The County shall update the water system master plan every couple of years, even if there is no pending supply or capacity threat.

Based on current water demand projects, the Phase 2 water supply capacity could be exceeded within just a couple of years. Therefore, Phase 3 planning, environmental and engineering work should commence immediately to address the projected shortfall..

The County should continue to seek alternative sources for the large water demands projected at the STAMP campus. The community water supply agreements with the County are not intended to act as a source of water or revenue to supply STAMP beyond the initial 200,000 GPD commitment made by the County.

APPENDIX A

ORIGINAL ENGINEERING REPORT (2000)

FIGURES & TABLE

Future water supply estimates are based on several factors including estimated growth in population. In addition to serving the growth in population, the future water supply estimates reflect economic development within the County. It is anticipated that the commercial and industrial water usage will significantly increase as a result of this project. The most dramatic increases are expected to occur at the three NYS Thruway interchanges. Other factors, including wastewater treatment, solid waste, transportation, and zoning can affect population growth which would, in turn, affect water supply projections.

Future Water Demands

Future water demands were based upon the estimates contained in the CPWSS as well as the projections included in the Genesee County Water Supply program DEIS/FEIS. These estimates were reviewed and then revised as appropriate based upon anticipated increases in commercial and industrial water usage that is expected to occur as a result of this project.

The 1995 estimated average day and maximum day water demands for public water systems in Genesee County were 4.78 mgd and 7.13 mgd, respectively. Table 2-2 summarizes the future water demand estimates for public water systems by municipality for the year 2020. As shown, the average day and maximum day water demands for Genesee County are expected to increase to 6.66 mgd and 9.01 mgd, respectively, in the year 2020.

TABLE 2-2
FUTURE WATER DEMANDS FOR PUBLIC WATER SYSTEMS

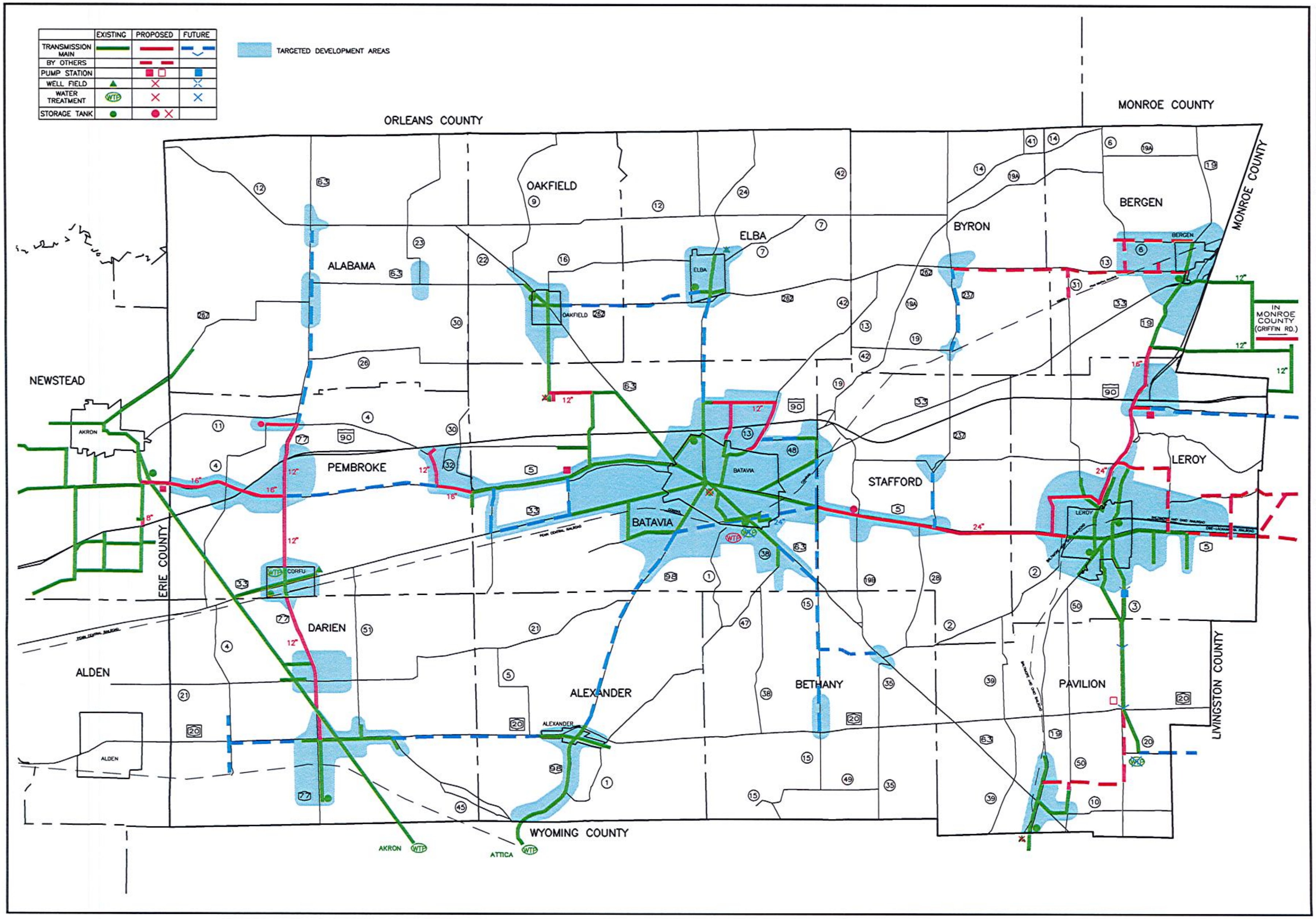
Municipality	2000 Water Source	2000 Demand*		2020 Water Source	2020 Demand	
		Estimated Population Served	Average Day (GPD)		Estimated Population Served	Average Day (GPD)
Alabama (T)	NONE	NA	NA	ECWA	65	50,000
Alexander (T/V)	ATTICA	950	87,000	MCWA	1,300	115,125
Batavia (C)	CITY	16,400	2,648,734	MCWA	16,450	2,652,734
Batavia (T)	CITY	3,828	381,866	MCWA	6,890	847,000
Bergen (T/V)	MCWA	1,995	263,220	MCWA	2,045	296,208
Bethany (T)	NONE	NA	NA	MCWA	300	30,000
Byron (T)	MCWA	500	50,000	MCWA	650	65,000
Darien (T)	AKRON	1,050	64,000	ECWA	1,400	111,275
Six Flags Darien Lake	CORFU/ECWA	NA	50,000	ECWA	NA	350,000
Elba (T/V)	ELBA	805	58,300	MCWA	870	63,500
LeRoy (T)	MCWA	297	86,118	MCWA	1,100	500,000
LeRoy (V)	LEROY	6,003	863,882	MCWA	5,550	827,642
Oakfield (T/V)	CITY	2,450	215,000	MCWA	2,545	222,600
Pavilion (T)	LEROY	789	75,000	MCWA	945	100,000
Pembroke (T)	CITY/ECWA	500	50,000	MCWA/ECWA	1,040	**250,000
Corfu (V)	CORFU	780	70,000	ECWA	850	75,600
Stafford (T)	MCWA	500	50,000	MCWA	750	100,000
TOTALS	NA	36,847	5,013,120	NA	41,340	6,656,684

*Based on numbers for 1995 from Sear Brown
** Includes estimates for commercial/industrial development

TABLE 9-1
PROJECT COSTS
PHASES I AND 2

	Project Element – Phase I	Cost
1	Route 19 and Griffin Road Transmission Main	$4.7
2	Route 5 (Limerock "Upgrades Transmission Main	$0.2
3	Route 5/Route 77 Transmission Main (Pembroke/Newstead)	$3.5
4	Route 5 Transmission Main (East Pembroke)	$0.9
5	Route 5/Route 19 Transmission Main and Storage Tank (Batavia-LeRoy)	$7.5
6	Oakfield Transmission Main	$0.4
7	Route 77 Transmission Main (Pembroke-Darien)	$2.5
8	Batavia "Airport Area" Transmission Mains	$1.3
	TOTAL PHASE I (2000-2002)	$21.0
A	Monroe County Water Authority "Major" Connection (North Road to Chili)	$11.0
B	Route 33 Transmission Main	$1.0
C	Seven Springs/College Avenue Transmission Main	$1.0
D	Elba Transmission Main	$1.0
E	Elba-Oakfield Transmission Main	$1.0
F	Batavia-Alexander Transmission Main	$3.0
G	Alexander-Darien Transmission Main	$2.0
H	Alabama Transmission Main	$2.0
I	Bethany Transmission Main	$2.0
J	Route 5 Transmission Main (East-West Pembroke)	$2.0
K	Byron-Stafford Transmission Main	$3.0
	TOTAL PHASE II (2005-2015)	$29.0
	TOTAL	$50.0

The project will be financed primarily through state/federal grant programs and the MCWA. Applications have been submitted to the New York State Drinking Water Revolving Fund and will be to the United States Department of Agriculture Rural Development fund. Approximately $6+/- million in grant funding is anticipated. The MCWA has also agreed to serve as a financing agency for the project. Under this arrangement, the MCWA would acquire title to those portions of the county-wide system to be financed by the MCWA (both new construction and debt assumption) and an agreement with Genesee County would be reached to affect a payment plan for facilities construction and water supply. In addition, it is anticipated that the County's annual investment will be approximately $500,000.



NO.	DATE	BY	CHKD	DESCRIPTION
1	02/04/99	JMH	SGV	REVISED FOR 02/10/99 MEETING
2	02/19/99	JMH	SGV	02/19/99 FEIS
3	02/22/99	JMH	SGV	02/22/99 FEIS
4	12/13/99	MN	JS	MODIFIED WATER MAIN AND LEGEND
5	01/20/00	MN	JS	MODIFIED WATER MAIN

REVISIONS

CPA
CLARK PATTERSON ASSOCIATES
DESIGN PROFESSIONALS
186 North Water Street
Rochester, New York 14604
716-454-7600

GENESEE COUNTY
GENESEE COUNTY WATER SUPPLY PROGRAM
GENESEE COUNTY NEW YORK

DATE	DRAWN	CHECKED
12/09/98	EWB	KSM

SCALE N.T.S.

SHEET TITLE
PHASE I AND PHASE II OF PROGRAM

PROJECT NUMBER 8093

FIGURE NUMBER 1

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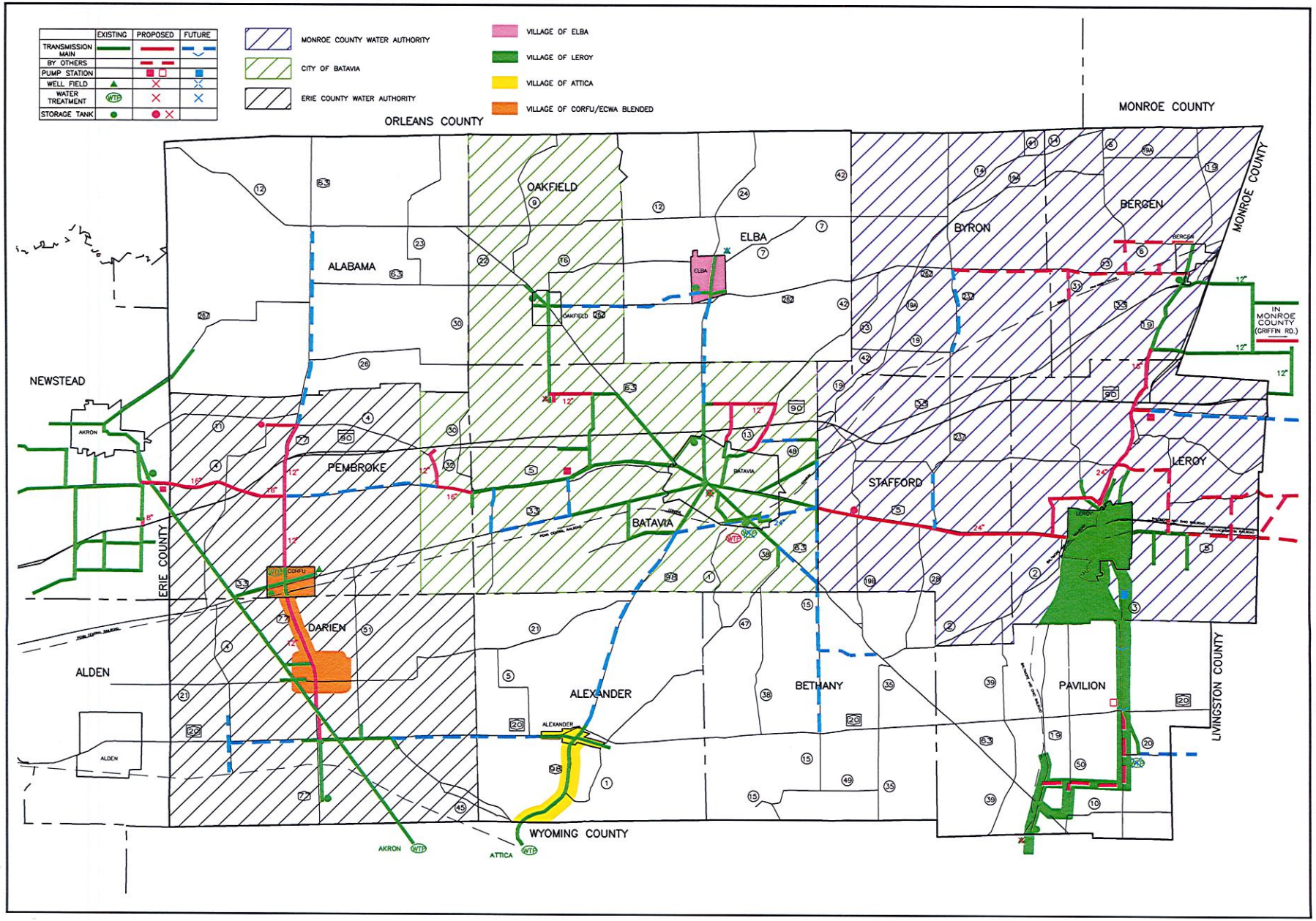

REVISIONS

NO.	DATE	BY	CHKD	DESCRIPTION

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ENGINEERING & LAND SURVEYING PROFESSIONALS
100 North Water Street
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GENESEE COUNTY WATER SUPPLY PROGRAM

GENESEE COUNTY NEW YORK

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SCALE N.T.S.

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WATER SERVICE AREAS - 2000

PROJECT NUMBER 8093

FIGURE NUMBER 3

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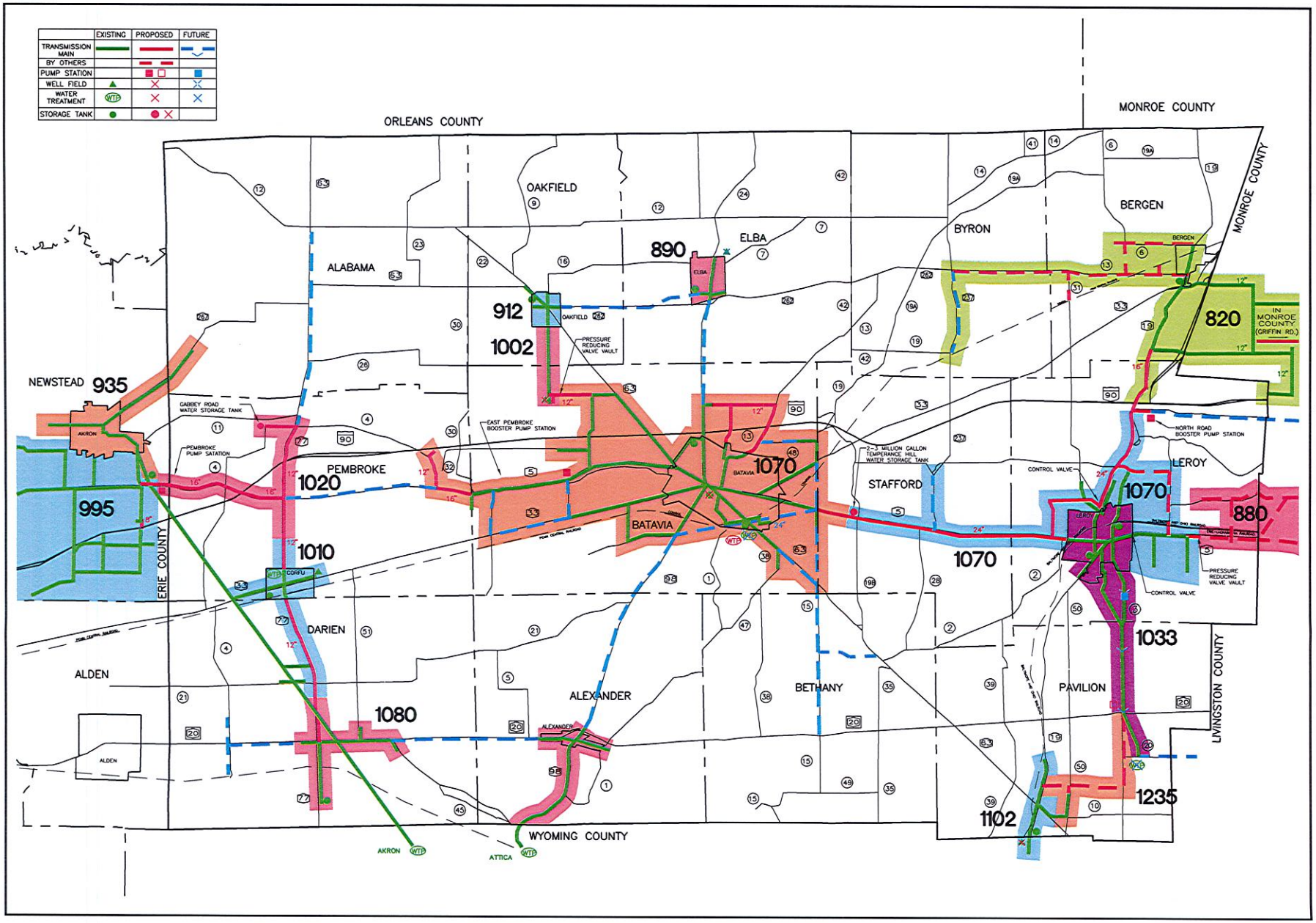

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GENESEE COUNTY
GENESEE COUNTY WATER SUPPLY PROGRAM
GENESEE COUNTY NEW YORK

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PHASE I HYDRAULIC ZONES

PROJECT NUMBER
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FIGURE NUMBER

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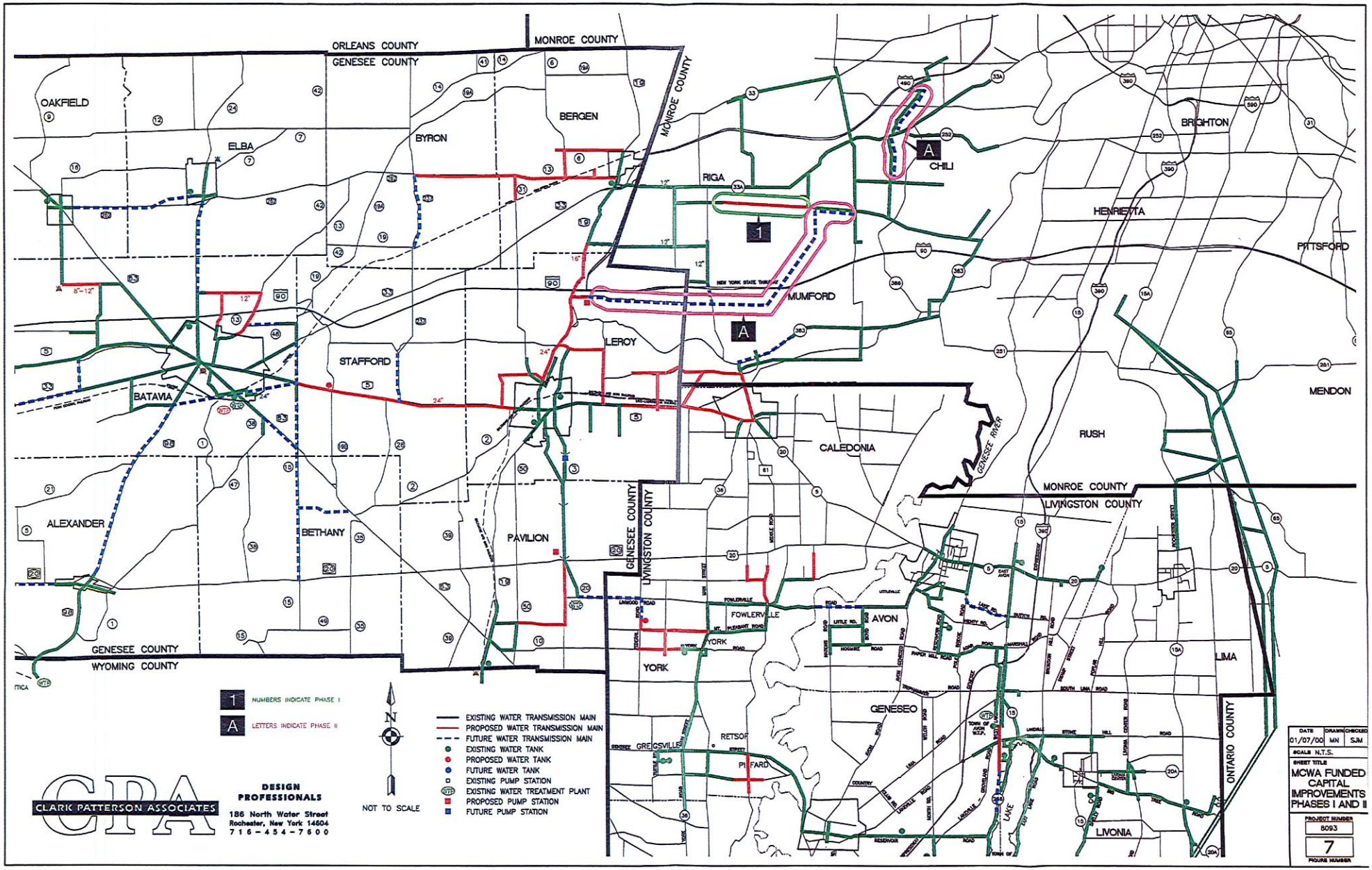
ORLEANS COUNTY
GENESEE COUNTY
MONROE COUNTY
OAKFIELD
ELBA
BYRON
BERGEN
RIGA
CHILI
BRIGHTON
HENRIETTA
PITTSFORD
MUMFORD
LEROY
STAFFORD
BATAVIA
MENDON
RUSH
CALEDONIA
GENESEE RIVER
MONROE COUNTY
LIVINGSTON COUNTY
ALEXANDER
BETHANY
PAVILION
GENESEE COUNTY
LIVINGSTON COUNTY
FOWLERVILLE
AVON
YORK
LIMA
GENESEO
RETSOF
GREGSVILLE
PITTSFORD
LIVONIA
ONTARIO COUNTY
GENESEE COUNTY
WYOMING COUNTY
ITHACA
1 NUMBERS INDICATE PHASE I
A LETTERS INDICATE PHASE II
N
NOT TO SCALE
EXISTING WATER TRANSMISSION MAIN
PROPOSED WATER TRANSMISSION MAIN
FUTURE WATER TRANSMISSION MAIN
EXISTING WATER TANK
PROPOSED WATER TANK
FUTURE WATER TANK
EXISTING PUMP STATION
EXISTING WATER TREATMENT PLANT
PROPOSED PUMP STATION
FUTURE PUMP STATION
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SHEET TITLE
MCWA FUNDED CAPITAL IMPROVEMENTS PHASES I AND II
PROJECT NUMBER 8093
FIGURE NUMBER 7

APPENDIX B

ORIGINAL PHASE 2 (2012)

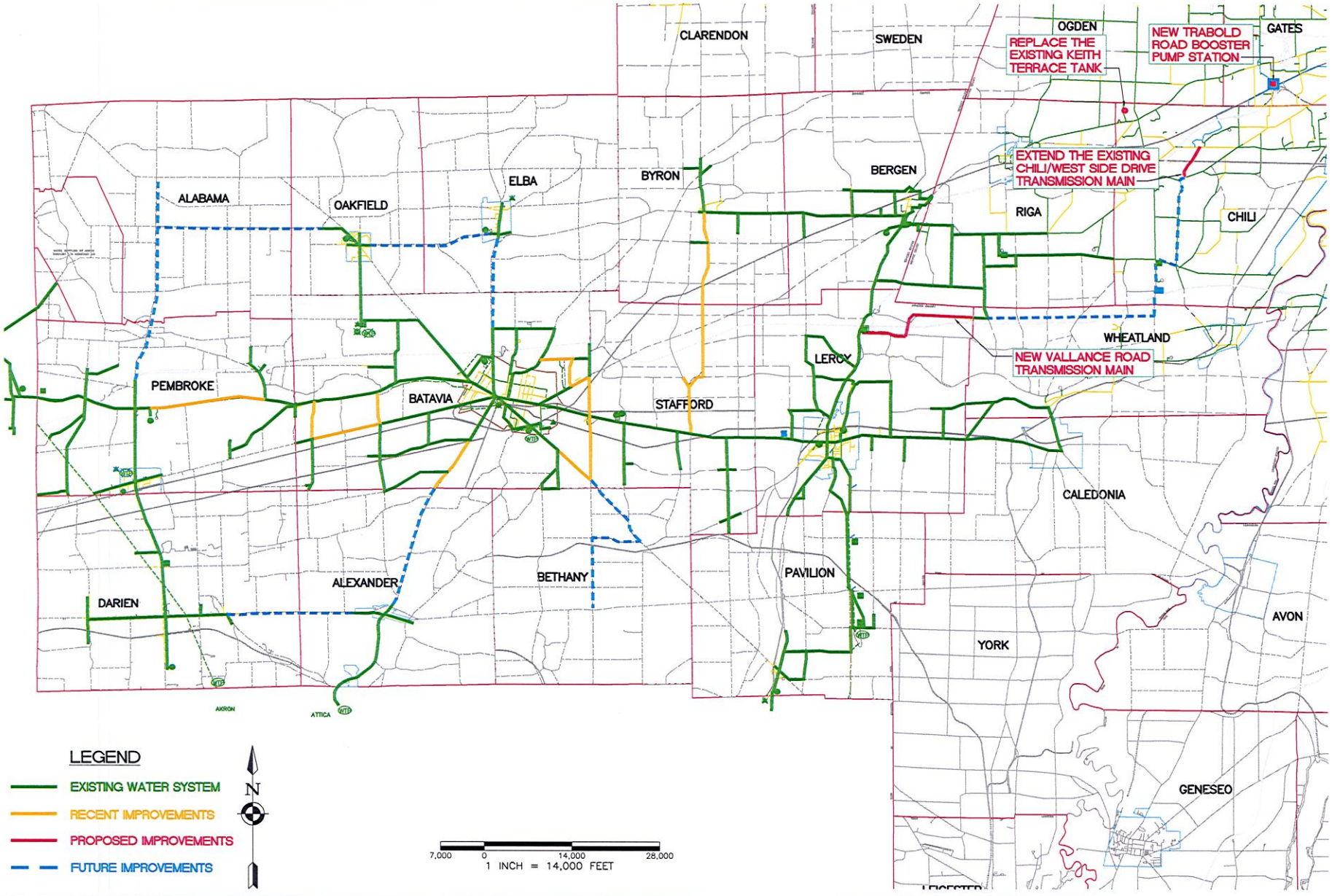
FIGURES & ESTIMATE

GENESEE COUNTY PHASE 2
2000-2012 COMPARATIVE COST ANALYSIS

Segment	Project Element	2000 Cost	2012 Cost
A-1	MCWA "Major" Connection (Phase 2A)	$0	$10,550,000 [1]
A-2	MCWA "Major" Connection (Phase 2B)	$11,000,000	$10,000,000 [1,2]
B	Route 33 Transmission Main (Phase 2B)	$1,000,000	$0 [3]
C	Seven Spring/College Ave Trans. Main (Phase 2B)	$1,000,000	$0 [4]
D	Elba Transmission Main (Phase 2B)	$1,000,000	$1,616,000 [5]
E	Elba-Oakfield Transmission Main (Phase 2B)	$1,000,000	$2,016,000
F	Batavia-Alexander Transmission Main (Phase 2B)	$3,000,000	$2,119,000 [6]
G	Alexander-Darien Transmission Main (Phase 2B)	$2,000,000	$2,044,000
H	Alabama Transmission Main (Phase 2B)	$2,000,000	$6,119,000 [7]
I	Bethany Transmission Main (Phase 2B)	$2,000,000	$3,474,000 [8]
J	Route 5 Transmission Main (Phase 2B)	$2,000,000	$0 [9]
K	Byron-Stafford Transmission Main (Phase 2B)	$3,000,000	$0 [10]
	TOTAL PHASE II	$29,000,000	$37,938,000

Notes:

1. The 2000 report did not include a cost for a Phase 2A. The MCWA has expanded the requirements of Segment A, but has also completed a portion of the improvements over the last several years.
2. Includes a new pump station and 52,000 LF of 24-inch water main.
3. Completed by the Town of Batavia between 2002 and 2009.
4. Completed by Genesee County under Phase 1 of the Genesee County Water Supply Program.
5. The Town of Batavia has a proposed water district that takes into account a portion of this project.
6. A portion of this project was completed by the Town of Batavia in 2009.
7. The Town of Alabama is currently in the planning stages of providing public water to these areas.
8. A portion of this project was completed by the Town of Batavia in 2008.
9. Completed by the Town of Pembroke in 2007.
10. Completed by the Towns' of Stafford and Byron between 2002 and 2007.



GENESEE COUNTY PHASE 2

GENESEE AND MONROE COUNTIES, NEW YORK

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PROJ. #:	8093.01

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Drawing Name: G:\PROJECTS\Genesee County Phase II\Acad\Figures\TRI-COUNTY_2010 Nov.DWG Date last accessed: 11/24/2010 6:21 PM Date last plotted: 3/13/2018 5:34 PM Plotted By: Jason Foote

APPENDIX C

ORIGINAL PHASE 2 (2016)

FIGURES & ESTIMATE

GENESEE COUNTY PHASE 2
2000 - 2016 COMPARATIVE COST ANALYSIS

PROJECT DESCRIPTION	PURPOSE	2000 COST	2012 COST	2015 COST	2016 COST	REMARKS
MCWA Major Connection	Eliminates City WTP	$ 11,000,000	$ 20,550,000	$ 20,550,000		
MCWA #1	Route 5 Booster Pump Station				$ 1,584,000	
MCWA #2	Union Street Booster Pump Station				$ 2,083,000	
MCWA #3	Golden Road Booster Pump Station				$ 1,527,000	
MCWA #4	North Road Booster Pump Station				$ 1,975,000	
MCWA #5	Buffalo Road Transmission Main				$ 5,032,000	
MCWA #6	Chili/West Side Drive Transmission Main				$ 2,943,000	
MCWA #7	Stottle Road Transmission Main				$ 4,926,000	
MCWA #8	Vallance Road Transmission Main				$ 19,180,000	
MCWA #9	Temperance Hill into/through City				$ 2,460,000	
MCWA #10	700 Zone Storage at Union Tank Site				$ 2,085,000	
MCWA #11	820 Zone Storage - North Rd BPS Suction				$ 1,134,000	
MCWA #12	1070 Zone Storage - location TBD				$ 5,782,000	
MCWA #13	Batavia/Oakfield Storage - location TBD				$ 9,757,000	
Subtotal MCWA requested work					**$ 60,468,000**	
Route 33 Transmission Main	Connection to Pembroke	$ 1,000,000	$ -	$ -	$ -	Completed by Batavia 2002-09
Seven Springs Transmission Main	MCWA Bypass of City	$ 1,000,000	$ -	$ -	$ -	Completed by Genesee Co in Phase I
Batavia-Elba Transmission Main	Connection to Elba	$ 1,000,000	$ 1,616,000	$ -	$ -	Completed by Batavia North District 2015
Elba-Oakfield Transmission Main	Interconnection	$ 1,000,000	$ 2,016,000	$ 1,616,000	$1,171,000	Partially Completed by Oakfield 2014
Batavia-Alexander Transmission Main	Connection to Alexander	$ 3,000,000	$ 2,119,000	$ -	$ -	Completed by Batavia/Alexander 2014
Alexander-Darien Transmission Main	Interconnection	$ 2,000,000	$ 2,044,000	$ 2,107,000	$1,881,000	
Oakfield-Alabama Transmission Main	Connection to Alabama	$ 2,000,000	$ 6,119,000	$ -	$ -	Project to be covered by GCEDC/STAMP
Pembroke-Alabama Transmission Main	Connection to Alabama	$ -			$1,879,000	Was originally part of the Oakfield-Alabama connection
Bethany Transmission Main	Connection to Bethany	$ 2,000,000	$ 3,474,000	$ 4,659,000	$4,659,000	
Route 5 Transmission Main	Interconnection West-East	$ 2,000,000	$ -	$ -	$ -	Project completed by Pembroke 2007
Byron-Stafford Transmission Main	Interconnection	$ 3,000,000	$ -	$ -	$ -	Completed by Byron/Stafford 2002-07
Total PHASE 2		**$ 29,000,000**	**$ 37,938,000**	**$ 28,932,000**	**$ 70,058,000**	

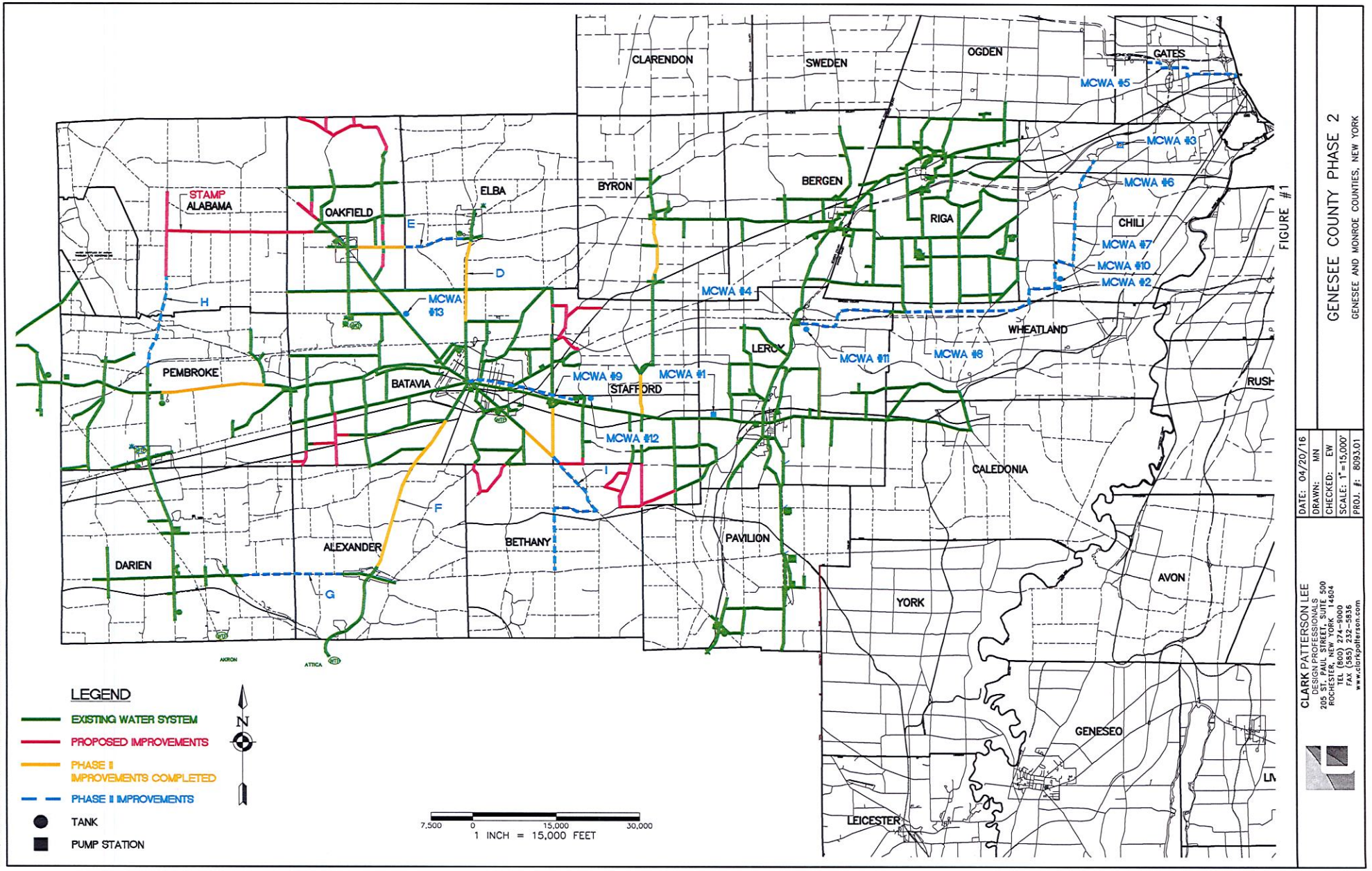

FIGURE #1

GENESEE COUNTY PHASE 2

GENESEE AND MONROE COUNTIES, NEW YORK

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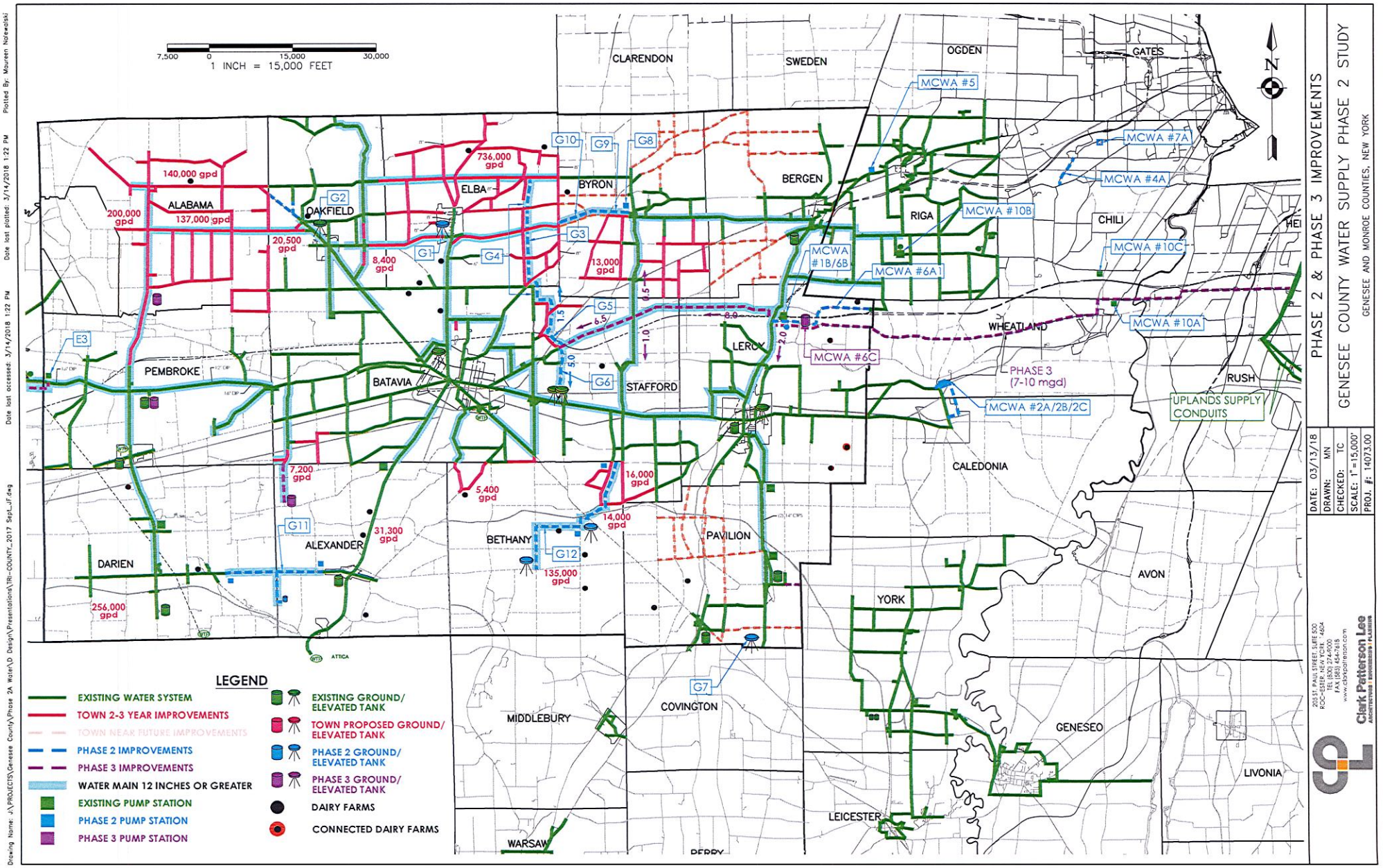
APPENDIX D

NEW PHASE 2 STUDY

- Phase 2 & Phase 3 Improvements
- Forecasted Demands
- Maximum Day Demands
- Supply Source Capacities
- Preliminary Cost Estimate
- Revenue Projections
- Storage Map



PHASE 2 & PHASE 3 IMPROVEMENTS

GENESEE COUNTY WATER SUPPLY PHASE 2 STUDY

GENESEE AND MONROE COUNTIES, NEW YORK

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Drawing Name: J:\PROJECTS\Genesee County\Phase 2A Water\D Design\Presentations\TRI-COUNTY_2017 Sept_JF.dwg Date last accessed: 3/14/2018 1:22 PM Date last plotted: 3/14/2018 1:22 PM Plotted By: Maureen Nalewalski

Genesee County Water Supply Phase 2 Study
Forecasted Demands
March 2018

DEMAND SUMMARY	2017 Avg MGD	2017 Max MGD	Phase 2 Avg MGD	Phase 2 Max MGD	Current Capacity MGD	Phase 2 Surplus/ (Deficit) MGD	Phase 3 Avg MGD	Phase 3 Max MGD	Future Avg MGD	Future Max MGD
Genesee West	0.43	0.95	0.87	1.31	1.68	0.38	1.76	2.64	2.51	3.77
Genesee Central/Batavia	3.52	5.25	4.01	6.01	4.50	(2.22)	5.93	8.90	9.03	15.50
Genesee East	1.58	2.45	1.65	2.47	2.50	0.03	2.43	3.65	3.18	4.78
TOTAL	**5.53**	**8.66**	**6.53**	**9.79**	**8.68**	**(1.81)**	**10.13**	**15.19**	**14.73**	**24.05**

Genesee County Water Supply Phase 2 Study
Forecasted Demands
March 2018

	Current Demand		Phase 2		Phase 3		Future	
	2017 Average	2017 Max	Average	Max	Average	Max	Average	Max
Western Genesee County	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
Pembroke	0.129	0.220	0.180	0.270	0.280	0.420	0.667	1.000
Corfu	0.039	0.064	0.053	0.080	0.067	0.100	0.080	0.120
Darien	0.197	0.575	0.554	0.831	0.667	1.000	1.000	1.500
STAMP	0	0.000	0.000	0.000	0.667	1.000	0.667	1.000
Unaccounted (10%)	0.064	0.094	0.083	0.124	0.083	0.124	0.100	0.150
Total Current	**0.429**	**0.953**	**0.870**	**1.305**	**1.763**	**2.644**	**2.513**	**3.770**
		Capacity		**Capacity**		**Capacity**		**Capacity**
ECWA Rt 5 Purchases		1.500		1.500		1.500		1.500
ECWA Future Rt 5 Purchases		0.000		0.000		0.000		0.000
ECWA Future Rt 20 Purchases		0.000		0.000		0.000		0.000
Corfu Treatment Plant Production		0.180		0.180		0.180		0.180
Total Capacity		**1.680**		**1.680**		**1.680**		**1.680**
Available Supply		**0.727**		**0.375**		**-0.964**		**-2.090**

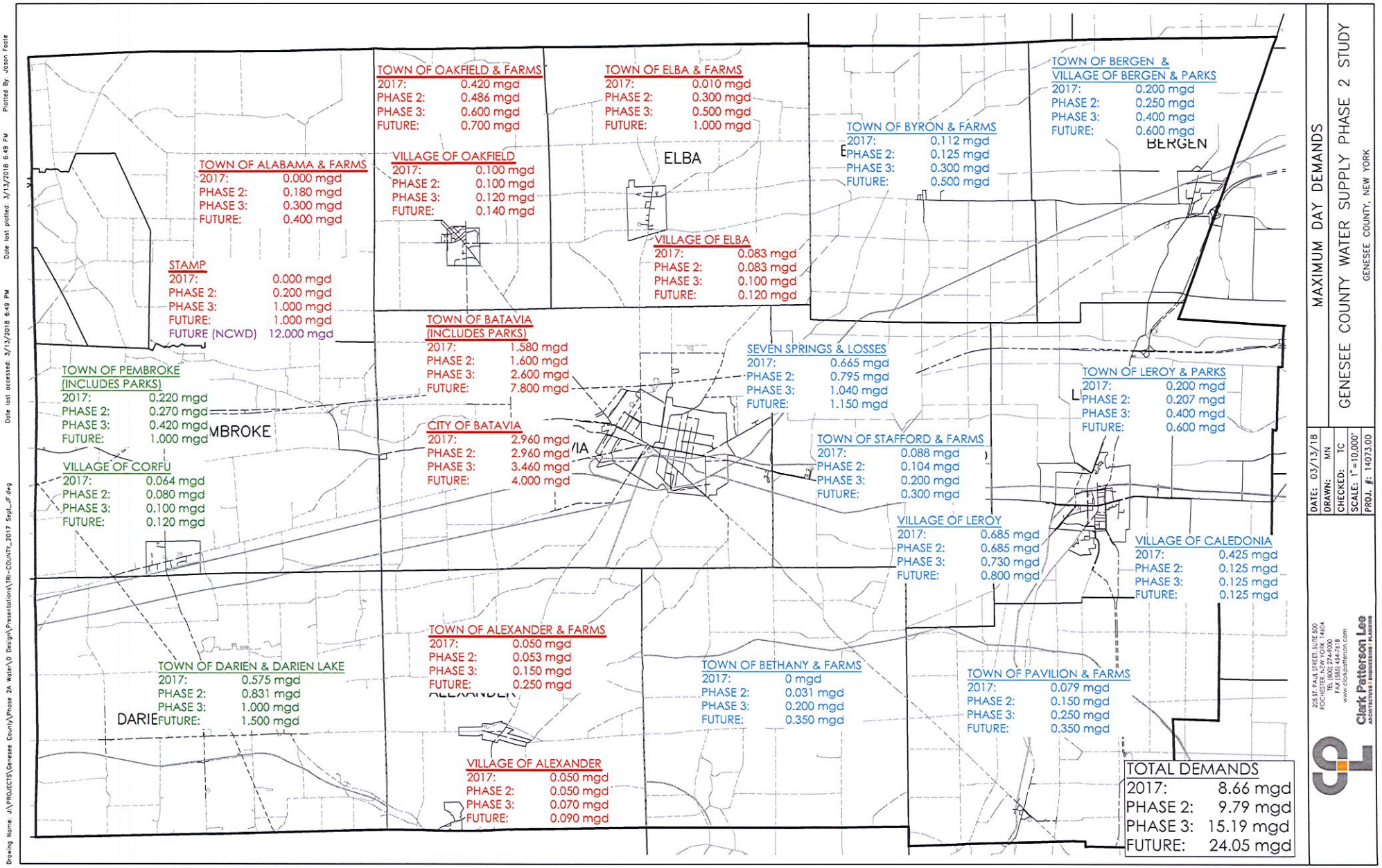
Genesee County Water Supply Phase 2 Study
Forecasted Demands
March 2018

	Current Demand		Phase 2		Phase 3		Future	
	2017 Average	2017 Max	Average	Max	Average	Max	Average	Max
Batavia City Plant	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
Batavia (C)	2.086	2.960	1.973	2.960	2.307	3.460	2.667	4.000
Batavia (T)	0.876	1.580	1.067	1.600	1.733	2.600	3.900	7.800
Alexander (T)	0.034	0.050	0.035	0.053	0.100	0.150	0.167	0.250
Alexander (V)	0.034	0.050	0.033	0.050	0.047	0.070	0.060	0.090
Elba (V)	0.050	0.083	0.055	0.083	0.067	0.100	0.080	0.120
Elba (T)	0.006	0.010	0.200	0.300	0.333	0.500	0.667	1.000
Oakfield (V)	0.084	0.100	0.067	0.100	0.080	0.120	0.093	0.140
Oakfield (T)	0.352	0.420	0.324	0.486	0.400	0.600	0.467	0.700
Alabama	0.000	0.000	0.120	0.180	0.200	0.300	0.267	0.400
STAMP	0.000	0.000	0.133	0.200	0.667	1.000	0.667	1.000
Total Current	**3.52**	**5.253**	**4.008**	**6.012**	**5.933**	**8.900**	**9.033**	**15.500**

	Rated Capacity	Operational Max Capacity	Operational Max Capacity	Operational Max Capacity	Operational Max Capacity
City of Batavia WTP	**6.00**	**4.500**	**4.500**	**4.500**	**4.500**
Current Surplus (MGD)		**-0.753**	**-1.512**	**-4.400**	**-11.000**

Genesee County Water Supply Phase 2 Study
Forecasted Demands
March 2018

	Current Demand		Phase 2		Phase 3		Future	
	2017 Average	2017 Max	Average	Max	Average	Max	Average	Max
Eastern Genesee County	**MGD**	**MGD**	**MGD**	**MGD**	**MGD**	**MGD**	**MGD**	**MGD**
Byron	0.055	0.112	0.083	0.125	0.200	0.300	0.333	0.500
Caledonia (T/V)	0.253	0.425	0.083	0.125	0.083	0.125	0.083	0.125
Bergen (T/V)	0.133	0.200	0.167	0.250	0.267	0.400	0.400	0.600
LeRoy (V)	0.370	0.685	0.457	0.685	0.487	0.730	0.533	0.800
LeRoy (T)	0.108	0.200	0.138	0.207	0.267	0.400	0.400	0.600
Stafford	0.066	0.088	0.069	0.104	0.133	0.200	0.200	0.300
Pavilion	0.056	0.079	0.100	0.150	0.167	0.250	0.233	0.350
Bethany	0.000	0.000	0.021	0.031	0.133	0.200	0.233	0.350
Bleeds to other zones	0.100	0.100	0.080	0.120	0.100	0.150	0.100	0.150
Unaccounted (10%)	0.140	0.225	0.183	0.275	0.260	0.390	0.267	0.400
Genesee County (Seven Springs)	0.302	0.340	0.267	0.400	0.333	0.500	0.400	0.600
Total Current	**1.583**	**2.454**	**1.648**	**2.472**	**2.430**	**3.645**	**3.183**	**4.775**
		Capacity		**Capacity**		**Capacity**		**Capacity**
North Road Booster Station		**2.500**		**2.500**		**2.500**		**2.500**
Current Available Supply (MGD)		**0.046**		**0.028**		**-1.145**		**-2.275**



MAXIMUM DAY DEMANDS

GENESEE COUNTY WATER SUPPLY PHASE 2 STUDY

GENESEE COUNTY, NEW YORK

DATE: 03/13/18
DRAWN: MN
CHECKED: TC
SCALE: 1" = 10,000'
PROJ. #: 14073.00

Clark Patterson Lee
ARCHITECTURE | ENGINEERING | PLANNING
255 ST. PAUL STREET, SUITE 500
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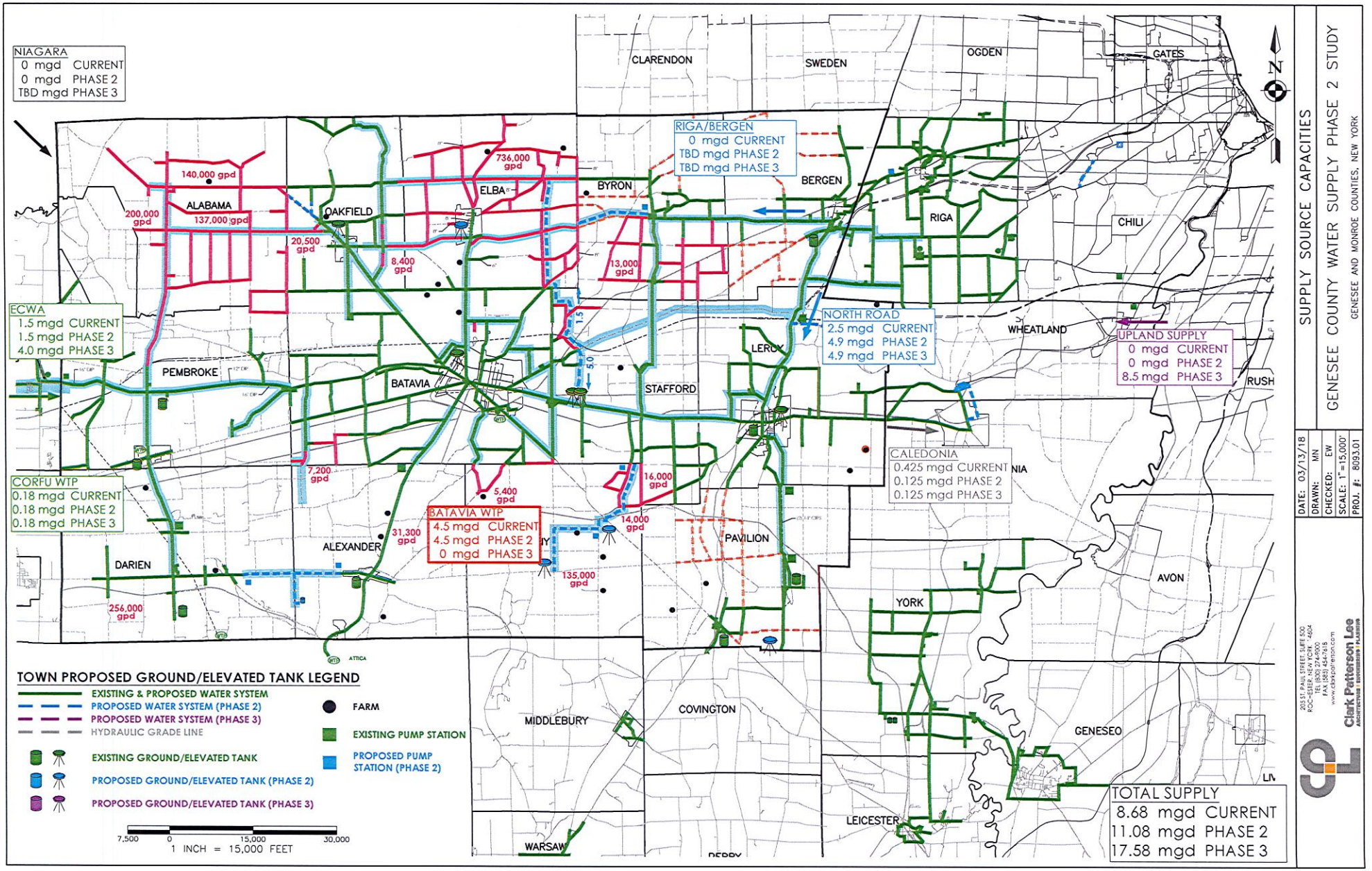

SUPPLY SOURCE CAPACITIES

GENESEE COUNTY WATER SUPPLY PHASE 2 STUDY

GENESEE AND MONROE COUNTIES, NEW YORK

DATE: 03/13/18
DRAWN: MN
CHECKED: EW
SCALE: 1" = 15,000'
PROJ. #: 8093.01

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Drawing Name: J:\PROJECTS\Genesee County\Phase 2A Water\D Design\Presentations\TRI-COUNTY_2017 Sept_JF.dwg Date last accessed: 3/14/2018 1:33 PM Date last plotted: 3/14/2018 1:48 PM Plotted By: Maureen Nalewajski

Genesee County Water Supply Phase 2 Study
Preliminary Cost Estimate
March 2018

PROJECT DESCRIPTION		ALL OPTIONS COST	Phase 2 +2.4 MGD (4.9/6.6/11.1 MGD Total) Operational 2018	+2.4 MGD as Sub-Phase to +10.0 MGD	+3.0 MGD (5.5/7.2/11.7 MGD Total) Operational 2018	+6.0 MGD (8.5/10.2/14.7 MGD Total) Operational 2022	Phase 3 +10.0 MGD (12.5/14.2 MGD Total) Operational 2027	+10 less '+2.4 Sub-Phase = 7.4 MGD
SUPPLY								
MCWA Sub Project								
1A	North Road Discharge Piping to Customers On Suction Side (includes PRV) (+2.4 & +3 mgd only)	$ 720,000	$ 720,000					
1B	North Road Discharge Piping (2") to Customers On Suction Side (includes PRV) (+2.4 & +3 mgd only)	$ 300,000			$ 300,000			
2A	Caledonia-Mumford New Pump Station (~0.35 mgd) - two 15 hp pumps (+2.4, +3, +6 mgd)	$ 820,000	$ 820,000	$ 820,000	$ 820,000	$ 820,000	$ 820,000	
2B	Mumford- Calendonia Main, Suction & Discharge on MCWA side (in Wheatland) (+2.4, +3, +6 mgd)	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	
2C	Caledonia Main Discharge Main Improvements (in Caledonia) (+2.4, +3, +6 mgd)	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	
3	Pembroke - Batavia Pump Station - no longer needed							
4A	Main from #1055 Paul Rd/30" pipe intersection to Chili Ave/Stottle intersection (24") (+2.4, +3, +6 mgd)	$ 2,943,000	$ 2,943,000		$ 2,943,000	$ 2,943,000		
4B	Main from #1055 Paul Rd/30" pipe intersection to Chili Ave/Stottle intersection (36") (+10 mgd)	$ 3,600,000		$ 3,600,000			$ 3,600,000	
5	Churchville to Bergen (Riga) New Pump Station (0.3 to 0.5 mgd) - two 15 hp pumps (+2.4, +3, +6 mgd)	$ 920,000	$ 920,000	$ 920,000	$ 920,000	$ 920,000	$ 920,000	
6A1	Vallance Road Main North Rd BPS to Riga Discharge (16") (+2.4 & 3 mgd)	$ 4,040,000	$ 4,040,000		$ 4,040,000			
6A2	Vallance Road Main North Rd BPS to Riga Discharge (20") (add later to 16" to equal 24" capacity)	$ 4,800,000						
6A3	Vallance Road Main North Rd BPS to Riga Discharge (24") (+6 mgd)	$ 5,400,000				$ 5,400,000		
6A4	Vallance Road Main North Rd BPS to Riga Discharge (30") (+10 mgd)	$ 7,000,000		$ 7,000,000			$ 7,000,000	
6B	North Road Booster Pump Station - replace pump 1 or 2 (4.55 to 5.15 mgd) - one pump to 250 hp (+2.4 & +3 mgd)	$ 600,000	$ 600,000		$ 600,000			
6C	North Road 1.0 MG Storage (820 Zone) - BPS Suction (+6 & +10 mgd)	$ 1,134,000				$ 1,134,000	$ 1,134,000	$ 1,134,000
7A	Golden Road New Booster Pump Station (Tabold Rd is same) - two 100 hp pumps (+2.4 mgd)	$ 1,527,000	$ 1,527,000					
7B	Golden Road New Booster Pump Station (Tabold Rd is same) (~7 mgd) - two 125 hp pumps (+3.0 mgd)	$ 1,677,000			$ 1,677,000			
7C	Golden Road New Booster Pump Station (Tabold Rd is same) (~10 mgd) - two 250 hp pumps (+6.0 mgd)	$ 2,177,000				$ 2,177,000		
7D	Golden Road New Booster Pump Station (Tabold Rd is same) (~14 mgd) - two 300 hp pumps (+10 mgd)	$ 2,577,000		$ 2,577,000			$ 2,577,000	$ -
8A1a	Union Street New Booster Pump Station (~3mgd) - two 200 hp pumps (+3 mgd)	$ 2,083,000			$ 2,083,000			
8A1b	Union Street New Booster Pump Station (~6mgd) - two 300 hp pumps (+6 mgd)	$ 2,583,000				$ 2,583,000		
8A1c	Union Street New Booster Pump Station (~10mgd) - two 500 hp pumps (+10 mgd)	$ 3,583,000					$ 3,583,000	$ 3,583,000
8A2a	Vallance Rd Main from Riga Discharge to Union Street BPS/Tank (20") (+3 mgd)	$ 10,320,000			$ 10,320,000			
8A2b	Vallance Rd Main from Riga Discharge to Union Street BPS/Tank (24") (+6 mgd)	$ 11,610,000				$ 11,610,000		
8A2c	Vallance Rd Main from Riga Discharge to Union Street BPS/Tank (30") (+10 mgd)	$ 15,050,000					$ 15,050,000	$ 15,050,000
8B1	Route 5 Booster New Pump Station West of LeRoy - two 50 hp pumps (+3 mgd) (MOVED TO DISTRIBUTION)	$ 1,584,000						
8B2	Route 5 Booster New Pump Station West of LeRoy - two 200 hp pumps (+6 mgd) (MOVED TO DISTRIBUTION)	$ 2,083,000						
8B3	Route 5 Booster New Pump Station West of LeRoy - two 350 hp pumps (+10 mgd) (MOVED TO DISTRIBUTION)	$ 2,783,000						
8C	1070 Zone Storage - location & size TBD (Batavia area) (+6 & +10 mgd) included in Genesee County Distribution	$ -						
9A1a	Golden BPS Suction Mains (in Gates), from 36" PCCP @ Buffalo Rd/City Line to 42" pipe @ Elmgrove/531 (16") (+6 mgd)	$ 5,032,000				$ 5,032,000		
9A1b	Golden BPS Suction Mains (in Chili & Gates), parrallel 30", from 30" @ RR/Cold Water to 42" north of 490 near Lyell Ave (24") (+10 mgd)	$ 10,300,000					$ 10,300,000	$ 10,300,000
9A2a	Stottle Road Main, from #60 Stottle to Morgan to Union Tank/BPS, parallel to exist 16" Stottle main (16") (+3 mgd)	$ 4,040,000			$ 4,040,000			
9A2b	Stottle Road Main, from #60 Stottle to Morgan to Union Tank/BPS, parallel to exist 16" Stottle main (24") (+6 mgd)	$ 5,400,000				$ 5,400,000		
9A2c	Stottle Road Main, from #60 Stottle to Morgan to Union Tank/BPS, parallel to exist 16" Stottle main (30") (+10 mgd)	$ 7,000,000					$ 7,000,000	$ 7,000,000
9A2d	Parallel Main from Union Tank to Union Road, parallel to (e) 16" tank feed (20") (+10 mgd)	$ 204,000					$ 204,000	$ 204,000
9B1	North Road Booster Pump Station - replace pumps 1 & 2 (8.15 mgd) - two 250 hp pumps (+6 mgd)	$ 1,200,000				$ 1,200,000		
9B2	North Road Booster Pump Station - replace pumps 1 & 2 (12.15 mgd) - four 300 hp pumps (+10 mgd)	$ 2,900,000		$ 1,450,000			$ 2,900,000	$ 1,450,000
9C	Batavia/Oakfield Storage - location & Size TBD. (+6 and +10 mgd). Included in Genesee County Distribution	$ -						
10A	Scottsville Booster Pump Station - upsize both pumps to 30 hp (+2.4, +3, +6 mgd)	$ 170,000	$ 170,000	$ 170,000	$ 170,000	$ 170,000	$ 170,000	
10B	Riga Pump Station - upsize one pumps to 100 hp (+2.4 mgd only)	$ 250,000	$ 250,000	$ 250,000			$ 250,000	
10C	Morgan Road Pump Station - upsize both pumps to 200 hp (+2.4 mgd only)	$ 950,000	$ 950,000	$ 950,000			$ 950,000	
11A	Parrallel Main from North RD BPS to Temperance Hill Tanks, along Rt 19 & Rt 5, parrallel to (e) 24" (20") (+10 mgd) (MOVED TO DISTRIBUTION)	$ 13,680,000						
11B	Mains from Temperance Hill Tanks to Batavia (+10mgd) - TBD - in Genesee County Distribution	$ -						
MCWA Subtotal			**$ 13,540,000**	**$ 18,337,000**	**$ 28,513,000**	**$ 39,989,000**	**$ 57,058,000**	**$ 38,721,000**

Genesee County Water Supply Phase 2 Study
Preliminary Cost Estimate
March 2018

PROJECT DESCRIPTION		ALL OPTIONS COST	Phase 2 +2.4 MGD (4.9/6.6/11.1 MGD Total) Operational 2018	+2.4 MGD as Sub-Phase to +10.0 MGD	+3.0 MGD (5.5/7.2/11.7 MGD Total) Operational 2018	+6.0 MGD (8.5/10.2/14.7 MGD Total) Operational 2022	Phase 3 +10.0 MGD (12.5/14.2 MGD Total) Operational 2027	+10 less '+2.4 Sub-Phase = 7.4 MGD
SUPPLY								
ECWA Sub Project								
E1	Newstead New Pump Station	$ 1,707,000		$ 1,707,000	$ 1,707,000	$ 1,707,000	$ 1,707,000	
E2	NYS Route 5 Transmission Main (16") - parallel to existing 12" water main	$ 9,468,000		$ 9,468,000	$ 9,468,000	$ 9,468,000	$ 9,468,000	
E3	Pembroke Pump Station - Upsize existing pumps	$ 637,000		$ 637,000	$ 637,000	$ 637,000	$ 637,000	
ECWA Subtotal			**$ -**	**$ 11,812,000**	**$ 11,812,000**	**$ 11,812,000**	**$ 11,812,000**	**$ -**
Batavia WTP								
Batavia #1	WTP Improvements - 10 year life span (2027 closing)	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ -	$ -	$ 2,500,000	$ -
Batavia #1	Rebuild WTP - 25 year life span	$ 36,400,000	$ -	$ -	$ -	$ -	$ -	$ -
Batavia WTP Subtotal			**$ 2,500,000**	**$ 2,500,000**	**$ -**	**$ -**	**$ 2,500,000**	**$ -**
Uplands Supply					**+1.7 MGD**	**+7.0 MGD**	**+10.0 MGD**	
Uplands #1	North Rd Main, North Rd to Beula Rd (36") (+1.7 mgd, +7mgd, +10 mgd)	$ 7,595,000			$ 7,595,000			
Uplands #2	North Rd Main, Buela Rd to Scottsville BPS (36") (+1.7 mgd, +7mgd, +10 mgd)	$ 14,545,000			$ 14,545,000			
Uplands #3	North Rd Main, Scottsville BPS to East River Rd (36") (+7 mgd, +10 mgd)	$ 7,120,000				$ 7,120,000		
Uplands #4A	Scottsville Booster Pump Station - add two 300 hp pumps (+7 mgd)	$ 1,700,000						
Uplands #4A	Scottsville Booster Pump Station - add two 400 hp pumps (+10 mgd)	$ 2,100,000				$ 2,100,000		
Uplands #5	North Rd Main, East River Rd to Conduits - parallel existing 24" (20") (+10 mgd)	$ 5,700,000					$ 5,700,000	
Uplands #6	New Meter Vault at Conduit Connection (+10 mgd)	$ 500,000					$ 500,000	
Uplands #7	Beula Rd Main, North Rd to Vallance/Riga Discharge (16") (original +2.4 mgd)	$ 1,320,600						
Uplands #8	Other	$ -						
Uplands Supply Subtotal					**$ 22,140,000**	**$ 9,220,000**	**$ 6,200,000**	
Uplands Supply Running Subtotal						**$ 31,360,000**	**$ 37,560,000**	

Genesee County Water Supply Phase 2 Study
Preliminary Cost Estimate
March 2018

SUB PROJ	PROJECT DESCRIPTION	All Options Cost	Phase 2 +2.4 MGD Operational 2018	Phase 3 +10.0 MGD Operational 2027	Master Plan: +2.4/+10.0 MGD Total Cost	Remarks
	DISTRIBUTION					
	NORTH					
G1	Elba Storage Tank 150,000 g upsize	$ 450,000	$ 450,000			
G1	Elba Storage Tank Water Quality Systems (Spray & Chlorine)	$ 75,000	$ 75,000			
G2	Oakfield Spray & Chlorine Systems for Existing Tank	$ 75,000	$ 75,000			
G3	Stafford-Elba Transmission Main. 12" Pipe Upgrade Norton, Bridge, Barville, Miller in Elba	$ 470,000	$ 470,000			18,800 lf upsize @$25 lf = $470,000
G3	Stafford-Elba Transmission Main. Additional 12" Pipe in Elba	$ 202,500	$ 202,500			1,500 lf additional 12" @ $135
G4	Stafford-Elba Transmission Main. 12" Pipe Upgrade in Stafford	$ 357,500	$ 357,500			14,300 lf upsize @$25 lf = $357,500
G5	Stafford-Elba Transmission Main. Additional 12" Pipe in Batavia	$ 562,500		$ 562,500		4,500 LF additional 12" @ $125/LF
G8	Town of Byron Pump Station	$ 1,300,000	$ 1,300,000			New Pump Station with two 15 hp pumps
G9	Town of Byron NYS Route 262 WM Upgrade 8" to 12" (Hamlet to Batavia-Byron Rd)	$ 95,000	$ 95,000			3,800 lf upsize @$25 lf = $95,000
G10	Town of Byron NYS Route 262 WM Upgrade 8" to 12" (Batavia-Byron Rd to Elba TL)	$ 212,500	$ 212,500			8,500 lf upsize @$25 lf = $212,500
		$ 3,800,000				
	MIDDLE					
-	Pembroke Chlorine System for Existing Tank	$ 50,000		$ 50,000		
-	Pembroke 1.0 mg Storage Tank (with Spray & Chlorine Systems)	$ 1,400,000				Tank $1.3m. Larger Sprayer & Chlorine $100,000
G14	Batavia Temperance Hill Spray & Chlorine Systems for Existing Tank	$ 100,000	$ 100,000			Larger Sprayer & Chlorine $100,000
G14	Batavia Temperance Hill Spray & Chlorine Systems for Existing Tank	$ 100,000	$ 100,000			Larger Sprayer & Chlorine $100,000
-	Alexander 1.0 mg Storage Tank (with Spray & Chlorine Systems)	$ 1,400,000		$ 1,400,000		Tank $1.3m. Larger Sprayer & Chlorine $100,000
-	Alexander 12" Halstead Rd Transmission Main to Tank	$ 937,500		$ 937,500		7,500 LF additional 12" @ $125/LF
-	Alexander 12" Pike Rd Transmission Main to Tank	$ 1,687,500		$ 1,687,500		13,500 LF additional 12" @ $125/LF
-	Parrallel Main from North RD BPS to Temperance Hill Tanks, along Rt 19 & Rt 5, parrallel to (e) 24" (20") (+10 mgd)	$ 13,680,000				20" main. 57,000 LF. $240/LF
-	Route 5 Booster New Pump Station West of LeRoy - two 350 hp pumps (+10 mgd)	$ 2,783,000				
	Option 1 Total	$ 16,463,000				
-	Main from North RD BPS to Temperance Hill Tanks, along Griswold, Rt 33 & Prole (24") (+8 mgd)	$ 14,100,000				24" main. 54,000 LF. $250/LF. RR crossing @$100k. Two I90 crossings @$250k/eac
	Option 2 Total	$ 14,100,000				
-	Main from North RD BPS to Temperance Hill Tanks, along Griswold, Rt 33 to Rt 237 (24") (+8 mgd)	$ 7,375,000		$ 7,375,000		24" main. 28,500 LF. $250/LF. one I90 crossing @$250k/eac
-	Main from North RD BPS to Temperance Hill Tanks, along Griswold, Rt 33 & Prole (20") (+6.5 mgd)	$ 3,654,000		$ 3,654,000		20" main. 14,800 LF. $230/LF. one I90 crossing @$250k/eac
G6	Main from North RD BPS to Temperance Hill Tanks, along Griswold, Rt 33 & Prole (20") (+5 mgd)	$ 2,538,000	$ 2,538,000			20" main. 10,600 LF. $230/LF. RR crossing @$100k
	Option 3 Total	$ 13,567,000				
	SOUTH					
G11	Alexander-Darien Route 20 12" Transmission Main - in Darien	$ 1,125,000	$ 12,500			18,000 LF 12" @ $125/LF
G11	Alexander-Darien Route 20 12" Transmission Main - in Alexander	$ 1,125,000				18,000 LF 12" @ $125/LF
G11	Town Line Rd Transmission Main to Darien Tank (12")	$ 937,500	$ 937,500			7,500 LF additional 12" @ $125/LF
G11	Darien 0.5 mg Storage Tank (with Spray & Chlorine Systems)	$ 2,100,000	$ 2,100,000			Tank & Pump Station $2m. Larger Sprayer & Chlorine $100,000
G12	Bethany 12" Transmission Main, 2 Tanks (with Spray & Chlorine systems) & Pump Station	$ 6,406,000	$ 4,500,000			Includes 150,000 g tank & booster pump station
G7	Pavilion Spray & Chlorine Systems for Existing Tank	$ 75,000	$ 75,000	$ 75,000		
		$ 11,768,500				
	Master Plan 5 Year Update	$ 200,000	$ 100,000	$ 100,000		
	TBD Additional in County Infrastructure	$ 600,000	$ 759,500	$ 340,500		
	Distribution Subtotal		**$ 13,960,000**	**$ 16,182,000**	**$ 30,142,000**	

Genesee County Water Supply Phase 2 Study
Preliminary Cost Estimate
March 2018

Master Plan: Supply & Distribution

	Phase 2 +2.4 MGD Operational 2018	Phase 3 +9.4 MGD Operational 2027	Phase 2 + 3 +2.4/+9.4 MGD Total Cost	Optional Upgrade +3.0 MGD Total Cost	Phase 2 + 3 +2.4/+12.4 MGD Total Cost
Option 1: +2.4 MGD MCWA +7.0 to 10.0 Uplands Supply = +9.4 to 12.4 MGD					
Distribution Subtotal	$ 13,960,000	$ 16,182,000	$ 30,142,000	$ -	$ 30,142,000
Batavia WTP Subtotal	$ 2,500,000	$ -	$ 2,500,000	$ -	$ 2,500,000
MCWA Subtotal	$ 13,540,000	$ -	$ 13,540,000	$ -	$ 13,540,000
Uplands Supply Subtotal	$ -	$ 31,360,000	$ 31,360,000	$ 6,200,000	$ 37,560,000
Option 1: Total Cost with +2.4 MGD MCWA +7.0 to 10.0 MGD Uplands Supply	**$ 30,000,000**	**$ 47,542,000**	**$ 77,542,000**	**$ 6,200,000**	**$ 83,742,000**

	Phase 2 +2.4 MGD Operational 2018	Phase 3 +10.0 MGD Operational 2027	Phase 2 + 3 +2.4/+10.0 MGD Total Cost
Option 2: +10 MGD MCWA Supply			
Distribution Subtotal	$ 13,960,000	$ 16,182,000	$ 30,142,000
Batavia WTP Subtotal	$ 2,500,000	$ -	$ 2,500,000
MCWA Subtotal	$ 18,337,000	$ 38,721,000	$ 57,058,000
Uplands Supply Subtotal	$ -	$ -	$ -
Option 2: Total Cost +10 MGD MCWA SUPPLY	**$ 34,797,000**	**$ 54,903,000**	**$ 89,700,000**

Genesee County Water Supply Phase 2 Study
Revenue Projections
March 2018

DEMAND SUMMARY	2017 Avg MGD	2017 Max MGD	Phase 2 Avg MGD	Phase 2 Max MGD	Current Capacity MGD	Phase 2 Surplus/ (Deficit) MGD	Phase 3 Avg MGD	Phase 3 Max MGD	Future Avg MGD	Future Max MGD
Genesee West	0.43	0.95	0.87	1.31	1.68	0.38	1.76	2.64	2.51	3.77
Genesee Central/Batavia	3.52	5.25	4.01	6.01	4.50	(2.22)	5.93	8.90	9.03	15.50
Genesee East	1.58	2.45	1.65	2.47	2.50	0.03	2.43	3.65	3.18	4.78
TOTAL	5.53	8.66	6.53	9.79	8.68	(1.81)	10.13	15.19	14.73	24.05

DEBT SERVICE	$1,000,000	$10,000,000	$20,000,000	$30,000,000	$40,000,000
4% for 30 years	$57,831	$578,301	$1,156,602	$1,734,903	$2,313,204
3% for 30 years	$51,020	$510,193	$1,020,386	$1,530,578	$2,040,771

PROJECTED REVENUE
2017 Avg Demand (MGD) = 5.53
Annual Debt per $1m @ 4% for 30 years $57,831

	Surcharge =	$0.30		$0.60		$0.90		$1.20		$1.50		$1.80	
SOURCE		Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital
Reserve			$2,000,000		$2,000,000		$2,000,000		$2,000,000		$2,000,000		$2,000,000
Remaining GCEDC CBA			$1,300,000		$1,300,000		$1,300,000		$1,300,000		$1,300,000		$1,300,000
Existing $0.60 Surcharge Fund Balance (2017)		$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117
Subtotal Current Available Funds			**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**
Additional Surcharge	$0.30	$606,010	$10,478,973										
Additional Surcharge	$0.60			$1,212,019	$20,957,946								
Additional Surcharge	$0.90					$1,818,029	$31,436,920						
Additional Surcharge	$1.20							$2,424,038	$41,915,893				
Additional Surcharge	$1.50									$3,030,048	$52,394,866		
Additional Surcharge	$1.80											$3,636,057	$62,873,839
AVAILABLE ANNUAL REVENUE		$956,010		$1,562,019		$2,168,029		$2,774,038		$3,380,048		$3,986,057	
AVAILABLE 30 YEAR CAPITAL			**$19,831,091**		**$30,310,064**		**$40,789,037**		**$51,268,010**		**$61,746,983**		**$72,225,957**

PROJECTED REVENUE
Phase 2 Avg Demand (MGD) = 6.53
Annual Debt per $1m @ 4% for 30 years $57,831

	Surcharge =	$0.30		$0.60		$0.90		$1.20		$1.50		$1.80	
SOURCE		Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital
Reserve			$2,000,000		$2,000,000		$2,000,000		$2,000,000		$2,000,000		$2,000,000
Remaining GCEDC CBA			$1,300,000		$1,300,000		$1,300,000		$1,300,000		$1,300,000		$1,300,000
Existing $0.60 Surcharge Fund Balance (2017)		$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117
Subtotal 2017 Available Funds			**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**
Additional Existing $0.60 Surcharge for 6.53 MGD Ave Demand		$217,175	$3,755,339	$217,175	$3,755,339	$217,175	$3,755,339	$217,175	$3,755,339	$217,175	$3,755,339	$217,175	$3,755,339
Subtotal 2018 Projected Available Funds			**$13,107,456**		**$13,107,456**		**$13,107,456**		**$13,107,456**		**$13,107,456**		**$13,107,456**
Additional Surcharge	$0.30	$714,597	$12,356,643										
Additional Surcharge	$0.60			$1,429,194	$24,713,285								
Additional Surcharge	$0.90					$2,143,791	$37,069,928						
Additional Surcharge	$1.20							$2,858,388	$49,426,571				
Additional Surcharge	$1.50									$3,572,985	$61,783,213		
Additional Surcharge	$1.80											$4,287,582	$74,139,856
AVAILABLE ANNUAL REVENUE		$1,281,772		$1,996,369		$2,710,966		$3,425,563		$4,140,160		$4,854,757	
AVAILABLE 30 YEAR CAPITAL			**$25,464,099**		**$37,820,741**		**$50,177,384**		**$62,534,027**		**$74,890,669**		**$87,247,312**

PROJECTED REVENUE

Avg Demand (MGD) = 7.00

Annual Debt per $1m @ 4% for 30 years $57,831

	Surcharge =	$0.30		$0.60		$0.90		$1.20		$1.50		$1.80	
SOURCE		Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital
Reserve			$2,000,000		$2,000,000		$2,000,000		$2,000,000		$2,000,000		$2,000,000
Remaining GCEDC CBA			$1,300,000		$1,300,000		$1,300,000		$1,300,000		$1,300,000		$1,300,000
Existing $0.60 Surcharge Fund Balance (2017)		$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117
Subtotal 2017 Available Funds			**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**
*Additional Existing $0.60 Surcharge for 7.00 MGD Ave Demand		$320,981	$5,550,328	$320,981	$5,550,328	$320,981	$5,550,328	$320,981	$5,550,328	$320,981	$5,550,328	$320,981	$5,550,328
***Subtotal 2018 Projected Available Funds**			**$14,902,445**		**$14,902,445**		**$14,902,445**		**$14,902,445**		**$14,902,445**		**$14,902,445**
Additional Surcharge	$0.30	$766,500	$13,254,137										
Additional Surcharge	$0.60			$1,533,000	$26,508,274								
Additional Surcharge	$0.90					$2,299,500	$39,762,411						
Additional Surcharge	$1.20							$3,066,000	$53,016,548				
Additional Surcharge	$1.50									$3,832,500	$66,270,685		
Additional Surcharge	$1.80											$4,599,000	$79,524,822
AVAILABLE ANNUAL REVENUE		$1,437,481		$2,203,981		$2,970,481		$3,736,981		$4,503,481		$5,269,981	
AVAILABLE 30 YEAR CAPITAL			**$28,156,582**		**$41,410,719**		**$54,664,856**		**$67,918,993**		**$81,173,130**		**$94,427,267**

*Note: Addition revenue from Existing $0.60 Surcharge assumes new full average demand for one entire year.

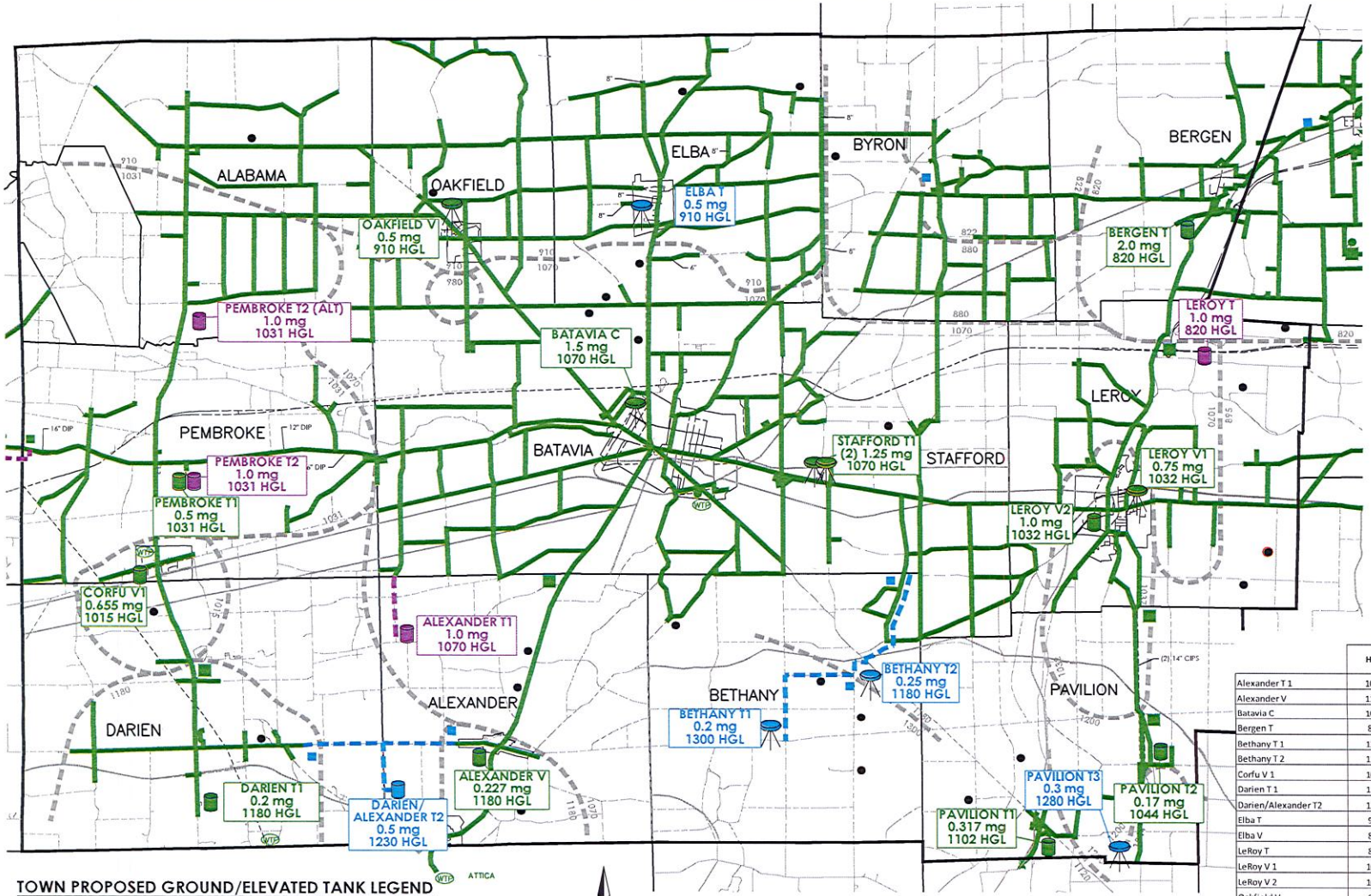
PROJECTED REVENUE

Avg Demand (MGD) = 9.00

Annual Debt per $1m @ 4% for 30 years $57,831

	Surcharge =	$0.30		$0.60		$0.90		$1.20		$1.50		$1.80	
SOURCE		Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital	Annual	Total Capital
Reserve			$2,000,000		$2,000,000		$2,000,000		$2,000,000		$2,000,000		$2,000,000
Remaining GCEDC CBA			$1,300,000		$1,300,000		$1,300,000		$1,300,000		$1,300,000		$1,300,000
Existing $0.60 Surcharge Fund Balance (2017)		$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117	$350,000	$6,052,117
Subtotal 2017 Available Funds			**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**		**$9,352,117**
*Additional Existing $0.60 Surcharge for 9.00 MGD Ave Demand		$758,981	$13,124,120	$758,981	$13,124,120	$758,981	$13,124,120	$758,981	$13,124,120	$758,981	$13,124,120	$758,981	$13,124,120
***Subtotal 2018 Projected Available Funds**			**$22,476,238**		**$22,476,238**		**$22,476,238**		**$22,476,238**		**$22,476,238**		**$22,476,238**
Additional Surcharge	$0.30	$985,500	$17,041,033										
Additional Surcharge	$0.60			$1,971,000	$34,082,067								
Additional Surcharge	$0.90					$2,956,500	$51,123,100						
Additional Surcharge	$1.20							$3,942,000	$68,164,133				
Additional Surcharge	$1.50									$4,927,500	$85,205,167		
Additional Surcharge	$1.80											$5,913,000	$102,246,200
AVAILABLE ANNUAL REVENUE		$2,094,481		$3,079,981		$4,065,481		$5,050,981		$6,036,481		$7,021,981	
AVAILABLE 30 YEAR CAPITAL			**$39,517,271**		**$56,558,304**		**$73,599,338**		**$90,640,371**		**$107,681,404**		**$124,722,438**

*Note: Addition revenue from Existing $0.60 Surcharge assumes new full average demand for one entire year.



TOWN PROPOSED GROUND/ELEVATED TANK LEGEND

- EXISTING & PROPOSED WATER SYSTEM
- PROPOSED WATER SYSTEM (PHASE 2)
- PROPOSED WATER SYSTEM (PHASE 3)
- HYDRAULIC GRADE LINE
- EXISTING GROUND/ELEVATED TANK
- PROPOSED GROUND/ELEVATED TANK (PHASE 2)
- PROPOSED GROUND/ELEVATED TANK (PHASE 3)
- FARM
- EXISTING PUMP STATION
- PROPOSED PUMP STATION (PHASE 2)

N

6,000 0 12,000 24,000

1 INCH = 12,000 FEET

		Total Storage Volume (MG)		
	HGL	Current	Phase 2	Phase 3
Alexander T 1	1070	0	0	**1.0**
Alexander V	1180	0.227	0.227	0.227
Batavia C	1070	1.5	1.5	1.5
Bergen T	820	2	2	2
Bethany T 1	1300	0	**0.2**	0.2
Bethany T 2	1180	0	**0.25**	0.25
Corfu V 1	1015	0.655	0.655	0.655
Darien T 1	1180	0.2	0.2	0.2
Darien/Alexander T2	1230	0	**0.5**	0.5
Elba T	915	0	**0.5**	0.5
Elba V	880	0.25	0	0
LeRoy T	820	0	0	**1**
LeRoy V 1	1032	0.75	0.75	0.75
LeRoy V 2	1032	1	1	1
Oakfield V	910	0.5	0.5	0.5
Pavilion T 1	1102	0.317	0	0
Pavilion T 2	1044	0.17	0.17	0.17
Pavilion T 3	1280	0	**0.3**	0.3
Pembroke T 1	1031	0.5	0.5	0.5
Pembroke T 2	1031	0	0.0	**1.0**
Stafford T 1 (Temperance)	1070	2.5	2.5	2.5
Total Storage Volume (MG) =		**10.569**	**11.752**	**14.752**
Operational Volume 50% (MG) =		**5.285**	**5.876**	**7.376**
Supply Capacity (Peak) (MG) =		**8.15**	**9.79**	**15.19**

STORAGE MAP

GENESEE COUNTY WATER SUPPLY PHASE 2 STUDY

GENESEE COUNTY, NEW YORK

DATE: 03/13/18
DRAWN: MN
CHECKED: JF
SCALE: 1" = 12,000'
PROJ. #: 8093.01

Clark Patterson Lee
ARCHITECTURE | ENGINEERING | PLANNING
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APPENDIX E

NEW PHASE 2 SEQR

SCOPE OF WORK

MCWA Supply Improvements

1B: North Road Water Main (3" domestic)
Location: Town of LeRoy, Genesee County
Road: NYS Route 19

Installation of approximately 2,500 linear feet of 3" HDPE water main, valves, and a blow off along the western side of NYS Route 19, north of the NYS Thruway and within the Town of LeRoy. The project requires boring under the NYS Thruway west of the bridge for NYS Route 19 and also NYS Route 19, just north of the intersection of North Road. The existing customers will be transferred from the suction side of the pumps to the higher discharge side of the pumps to improve pressures.

2A/2B/2C: Caledonia-Mumford Pump Station & Water Main (New)
Location: Town of Wheatland, Monroe County/ Northeast corner of Gutherie Road and Main Street (NYS Route 36)
Road: NYS Route 36

Construction of a new 20'x30' pump station building including pumps, interior piping, valves, instruments, chemical feed equipment, electrical related equipment, a backup generator and miscellaneous site work. The project includes the replacement of the existing 6" water main with approximately 500 linear feet of new 8" ductile iron water main. The new water main will be installed along the eastern side of NYS Route 36 from approximately house #1104 to the Monroe/Livingston County line, including a boring under the railroad tracks. The exact location of the pump station parcel has not been determined but it is expected to be either located on a parcel at the southeast corner of Guthrie Road and NYS Route 36 or on a vacant parcel located along the eastern side of NYS Route 36, just north of the railroad tracks.

4A: Chestnut Ridge Water Main (24")
Location: Town of Chili, Monroe County
Road: Chestnut Ridge Road

Installation of approximately 7,800 linear feet of 24" ductile iron water main, valves and appurtenances between an existing 30" water main located near #1055 Paul Road and an existing 24" water main located near the intersection of Chili Avenue and Stottle Road. The project requires the horizontal boring under a CSX Railroad and the clearing of small trees and brush across the rear properties along Chestnut Ridge Road.

5: Churchville/Bergen Pump Station (New)
Location: Town of Riga, Monroe County / Tentatively to on portion of parcel number 142.04-1-19.
Road: NYS Route 33

Construction of a new 20'x30' pump station building including pumps, interior piping, valves, instruments, chemical feed equipment, electrical related equipment, a backup generator and miscellaneous site work. The pump station is expected to be constructed on one of the available parcels located along the northern side of NYS Route 33 and just west of the intersection of Sanford Road North.

6A1: Vallance Road Water Main (16")
Location: Town of LeRoy, Genesee County
Roads: North Road & Vallance Road

Installation of approximately 19,500 linear feet of 16" ductile iron water main, valves and appurtenances along a portion of Vallance Road and North Road and between the existing 12" water main located along Vallance Road and to the water main near the North Road Pump Station. The proposed water main will be located along the southern side of Vallance Road to the point where it crosses under the NYS Thurway. From there the new water main will run cross lots through parcels 19.-1-5.1, 19.-1-29.111, 19.-1-26, and 19.-1-25.11 where it will be installed along the northern side of North Road up to the existing pump station. The project requires the horizontal boring under the NYS Thruway and some clearing of small trees and brush.

6B: North Road Pump Station (Upgrades)
Location: Town of LeRoy, Genesee County
Road: 7777 North Road (Northeast corner of NYS Route 19 and North Road)

Replacement of one (1) existing 60 HP pump with a new 250 HP pump including new variable frequency drives, piping modifications, installation of a new backup generator and miscellaneous electrical improvements within the existing North Road Pump Station.

7A: Golden Road Pump Station (New)
Location: Town of Chili, Monroe County / Tentatively to on portion of parcel number 132.20-1-7./CELL and 132.20-1-7.1
Address: Golden Road

Construction of a new 25'x45' pump station building including pumps, interior piping, valves, instruments, chemical feed equipment, electrical related equipment, a backup generator and miscellaneous site work. The pump station is expected to be constructed on a vacant parcel located along the western side of Golden Road between Interstate 490 and Chestnut Ridge Road.

10A: Scottsville Road Pump Station (Upgrades)
Location: Town of Wheatland, Monroe County
Address: Chili Wheatland Townline Road

Replacement of two (2) of the existing 20 HP pumps with new 30 HP pumps including new variable frequency drives and miscellaneous electrical improvements within the existing Scottsville Road Pump Station.

10B: Riga Pump Station (Upgrades)
Location: Town of Riga, Monroe County
Address: 281 Riga-Mumford Road

Replacement of one (1) existing pump with a new 100 HP pump including a new variable frequency drive, installation of a new backup generator and miscellaneous electrical improvements within the existing Riga Pump Station.

10C: Morgan Road Pump Station (Upgrades)
Location: Town of Chili, Monroe County
Address: 4200 Union Street (south east corner of Morgan Road & Union Street)

Replacement of two (2) of the existing pumps with new 200 HP pumps including new variable frequency drives and miscellaneous electrical improvements within the existing Morgan Road Pump Station.

Genesee County Distribution Improvements

G1: Town of Elba - Tank Upgrades
Location: Town of Elba, Genesee County
Address: 4365 Drake Street (NYS Route 262)

Involves making a financial contribution to the Town of Elba for proposed tank upgrades and improvements. This action involves no physical work and only a transfer of monies to the Town; the tank is being constructed as part of a separate Town of Elba project and will be undergoing a separate environmental review as design documents are prepared. All permits and approvals will be obtained as part of the Town's water project.

G2: Village of Oakfield - Tank Upgrades
Location: Village of Oakfield, Genesee County
Address: 6975 Lewiston Road

Involves installing a THM removal system and chlorine booster pump system within the existing Village of Oakfield water storage tank.

G3: Stafford/Elba Transmission Main – Town of Elba (portion)
Location: Town of Elba, Genesee County
Roads: Norton Road & Log City Road
Involves making a financial contribution to the Town of Elba for proposed upsizing of upsizing water mains and installation of new water mains. The action involves no physical work and only a transfer of monies to the Town; the water line installation will be a part of a separate Town of Elba project and will be undergoing a separate environmental review as design documents are prepared. All permits and approvals will be obtained as part of the Town's water project.

Involves making a financial contribution toward upsizing approximately 15,900 feet of the proposed 8" PVC water main to 12" PVC along Norton Road between the connection point to the existing 8" water main on Norton Road and Bridge Road and also along a portion of Log City Road between North Byron Road and 3,300 feet south of North Byron Road. The 8" PVC water main is being installed as part of a separate Town of Elba project.

This project also includes installing approximately 2,700 linear feet of new 12" water main along a portion of the western side of Log City Road from Bridge Road to the north and approximately 2,100 feet of new 12" water main along Norton Road from Batavia-Elba Townline Road to the north.

G4: Stafford/Elba Transmission Main – Town of Batavia (portion)
Location: Town of Batavia, Genesee County/ Tentatively to on portion of parcel number 142.04-1-19.
Roads: Starting East of Norton Rd on Batavia-Elba Townline Road and ending north of Fotch Rd on Batavia-Stafford Townline Road. Batavia-Elba Towline Road turns south onto Batavia-Stafford Townline Road.

Involves installing approximately 4,700 linear feet of 12" PVC water main and valves along a portion of the south side of Batavia-Elba Townline Road and west side of Batavia-Stafford Townline Road between Norton Road and Fotch Road. The new water main will be parallel to the existing 8" PVC water main.

G5: Stafford/Elba Transmission Main – Town of Stafford (portion)
Location: Town of Stafford, Genesee County
Roads: Prole Road Extension, Batavia-Byron Road, and Fotch Road

Involves making a financial contribution to the Town of Stafford for proposed upsizing of water mains and installation of new water mains. The action involves no physical work and only a transfer of monies to the Town; the water line installation will be a part of a separate Town of Stafford project and will be undergoing a separate environmental review as design documents are prepared. All permits and approvals will be obtained as part of the Town's water project.

Involves making a financial contribution toward upsizing approximately 14,000 feet of the proposed 8" PVC water main to 12" PVC along Prole Road Extension, Batavia-Byron Road, and Fotch Road. The 8" PVC water main is being installed as part of a separate Town of Stafford water project.

The project also includes installing approximately 600 linear feet of 12" PVC water main and valves along a portion of the south side of Fotch Road from Batavia-Stafford Townline Road to the east.

G6: Prole Road Water Main - Town of Stafford
Location: Town of Stafford, Genesee County
Roads: Prole Road, starting north out Main Street (Route 05) and ending south of Clinton Street (Route 33)

Installation of approximately 10,700 linear feet of 20" ductile iron water main, valves and appurtenances along the east side of Prole Road between NYS Route 33 and NYS Route 5.

G7: Town of Pavilion - Tank Upgrades
Location: Town of Pavilion, Genesee County

Involves making a financial contribution to the Town of Pavilion for proposed tank upgrades and improvements. The action involves no physical work and only a transfer of monies to the Town; the tank is being constructed as part of a separate Town of Pavilion project and will be undergoing a separate environmental review as design documents are prepared. All permits and approvals will be obtained as part of the Town's water project.

Involves making a financial contribution toward installing a THM removal system and chlorine booster pump system within the proposed Town of Pavilion water storage tank. The tank is being constructed as part of a separate Town of Pavilion water project. All permits and approvals will be obtained as part of the Town's water project.

G8: Town of Byron Pump Station (New)
Location: Town of Byron, Genesee County
Roads: NYS Route 262

Construction of a new approximately 20'x20' pump station building including pumps, interior piping, valves, instruments, chemical feed equipment, electrical related equipment, a backup generator, and miscellaneous site work. The project will require the purchase of land for construction of the new pump station building. The exact location of the pump station parcel has not been determined but it is expected to be along the north side of NYS Route 262, just west of the intersection of Caswell Road.

The project also requires the installation of several new pressure reducing valve vaults along NYS Route 262.

G9 & G10: Town of Byron – NYS Route 262 WM Upsize
Location: Town of Byron, Genesee County
Roads: NYS Route 262

Involves making a financial contribution to the Town of Byron for upsizing water mains and installation of new water mains. The action involves no physical work and only a transfer of monies to the Town; the water line installation will be a part of a separate Town of Byron project and will be undergoing a separate environmental review as design documents are prepared. All permits and approvals will be obtained as part of the Town's water project.

Involves making a financial contribution toward the upsizing approximately 12,300 feet of the proposed 8" PVC water main to 12" PVC. The water main is being installed as part of two separate Town of Byron water projects. All permits and approvals will be obtained as part of the Town's water projects.

G11: Town of Darien/Alexander – Water System Contribution
Location: Town of Darien and Town of Alexander, Genesee County

Involves making a financial contribution toward the Town of Darien and Town of Alexander's proposed joint water system project located along NYS Route 20 and Darien-Alexander Townline Road. All permits and approvals will be obtained as part of the Town's water project.

G12: Town of Bethany – Water System Contribution
Location: Town of Bethany, Genesee County

Involves making a financial contribution toward the Town of Bethany's proposed water system project. All permits and approvals will be obtained as part of the Town's water project.

G14: Town of Stafford – Temperance Hill Tank Upgrades
Location: Town of Stafford, Genesee County

Involves installing a THM removal system within each of the two existing Temperance Hill water storage tanks.

City of Batavia Supply Improvements

G15: City of Batavia – Water Treatment Plant Improvements Contribution

Location: City of Batavia, Genesee County

Involves making a financial contribution to the City of Batavia for proposed upgrades and improvements. The action involves no physical work and only a transfer of monies to the City; the upgrades and improvements would be constructed as part of a separate City of Batavia project and will be undergoing a separate environmental review as design documents are prepared. All permits and approvals will be obtained as part of the City's water project.

Involves making a financial contribution toward improvements at the City of Batavia's Water Treatment Plant. All permits and approvals will be obtained as part of the City's project.

ECWA Route 5 Supply Improvements

E1: Erie County Water Authority – Newstead Pump Station

Location: Town of Newstead, Erie County
Address: NYS Route 5 & Davison Road

Construction of a new pump 1,500 square foot station building including pumps, interior piping, valves, instruments, chemical feed equipment, electrical related equipment, a backup generator and miscellaneous site work. The pump station is expected to be constructed along the northern side of NYS Route 5 near Davison Road.

E2: Erie County Water Authority – NYS Route 5 Transmission Main

Location: Town of Newstead, Erie County
Road: NYS Route 5, starting east of Davison Road ending west of Crittenden Road

Installation of approximately 33,000 linear feet of 16" ductile iron water main along the south side of NYS Route 5 from Davison Road to the Genesee/Erie water main including valves and appurtenances.

E3: Pembroke Pump Station (Upgrades)

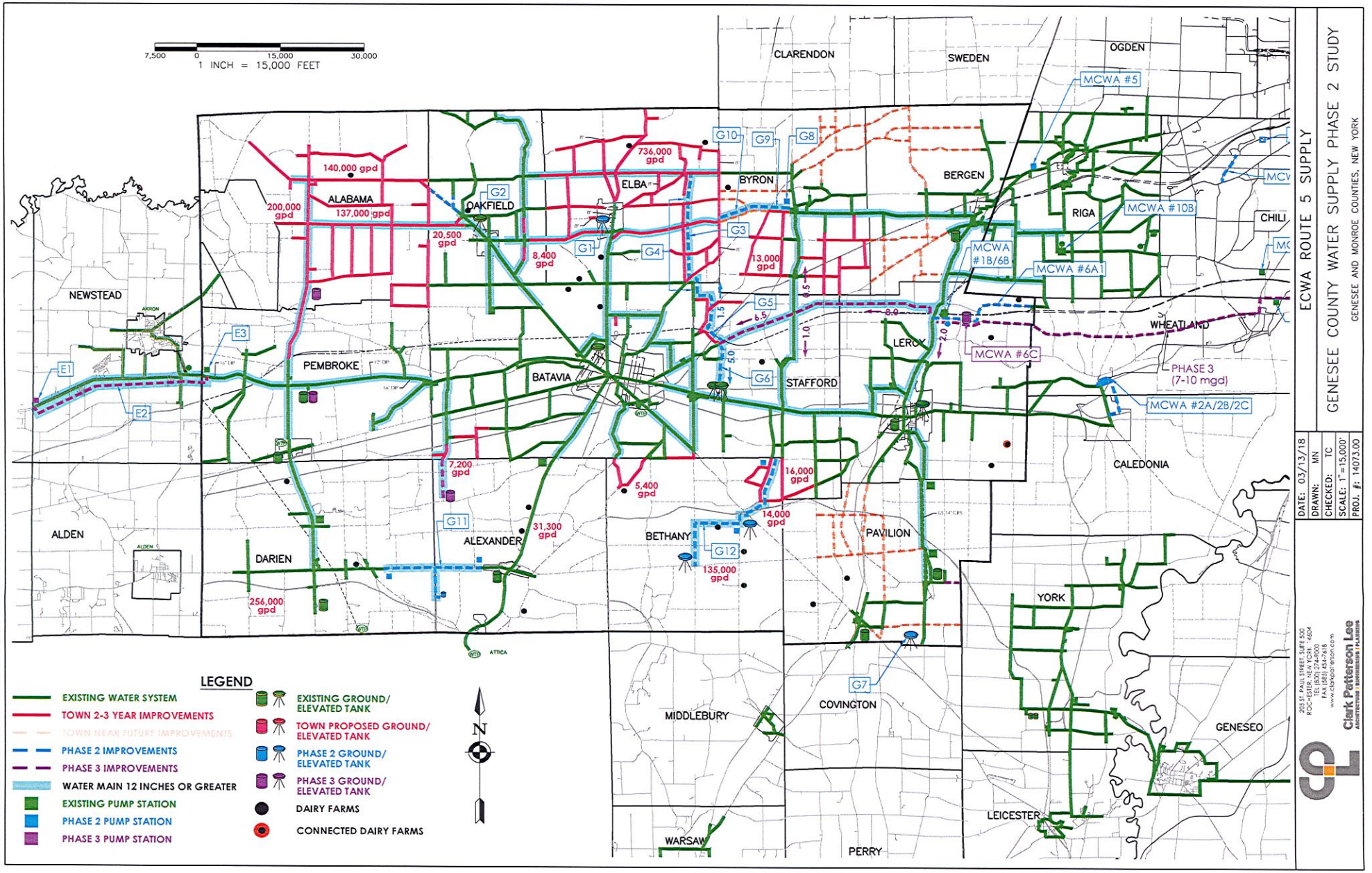
Location: Town of Pembroke, Genesee County
Address: 243 Main Road (NYS Route 5)

Replacement of two (2) of the existing pumps with larger pumps including new variable frequency drives and miscellaneous electrical improvements within the existing Pembroke Pump Station. NO DIGGING

APPENDIX F

ECWA ROUTE 5 SUPPLY

FIGURE & ESTIMATES



ECWA ROUTE 5 SUPPLY

GENESEE COUNTY WATER SUPPLY PHASE 2 STUDY

GENESEE AND MONROE COUNTIES, NEW YORK

DATE: 03/13/18
DRAWN: MN
CHECKED: TC
SCALE: 1" = 15,000'
PROJ. #: 14073.00

Clark Patterson Lee
ARCHITECTURE | ENGINEERING | PLANNING
20 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
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FAX (585) 454-7618
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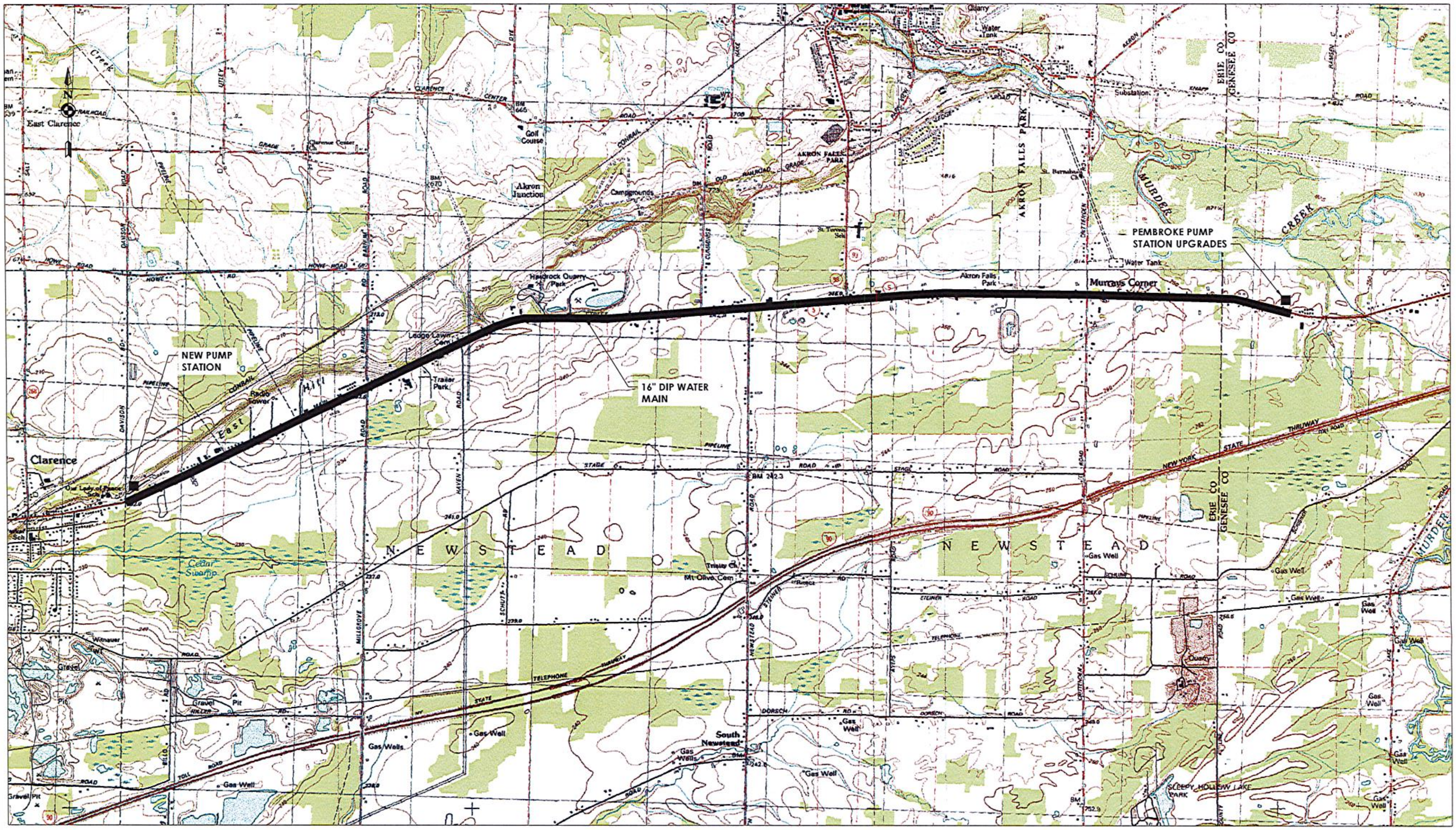
Drawing Name: J:\PROJECTS\Genesee County\Phase 2A Water\D Design\Presentations\TRI-COUNTY_2017 Sept_JF.dwg
Date last accessed: 3/14/2018 1:22 PM
Date last plotted: 3/14/2018 1:26 PM
Plotted By: Maureen Nalewajski



REVISIONS				
NO.	DATE	BY	CHKED	DESCRIPTION

205 ST. PAUL STREET, SUITE 500
ROCHESTER, NEW YORK 14604
TEL (800) 274-9000
FAX (585) 232-5836
www.clarkpatterson.com

Clark Patterson Lee
ARCHITECTURE | ENGINEERING | PLANNING

GENESEE COUNTY PHASE 2

GENESEE COUNTY NEW YORK

DATE: 1/19/2018
DRAWN: BMW
DESIGNED: JAF
CHECKED: JAF
SCALE: 1"=2500'

ERIE COUNTY WATER AUTHORITY IMPROVEMENTS

LOCATION MAP

PROJECT NUMBER 14073.02

DRAWING NUMBER D-01

Referenced Drawings: None
Drawing Name: J:\PROJECTS\Genesee County\P2A Water SEQR\D Design\ACAD\Civil\Site\E2_CONCEPT MAP.dwg
Date last accessed: 1/19/2018 2:25 PM
Date last plotted: 1/26/2018 2:37 PM
Plotted By Benedict Wolfing

Genesee County Water Supply (Phase 2)
Erie County Water Authority Improvements
Cost Estimate Summary
1/22/2018

E1 - Town of Newstead Pump Station

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL
1	Mobilization & Bonds	LS	1	$ 38,000	$ 38,000
2	New CMU Building (25'x45')	SF	1,125	$ 250	$ 281,250
3	Instruments & Controls	LS	1	$ 50,000	$ 50,000
4	Chlorine Feed Equipment	LS	1	$ 20,000	$ 20,000
5	Site Improvements	LS	1	$ 100,000	$ 100,000
6	End Suction Pump (250 HP) w/ VFD	EA	2	$ 200,000	$ 400,000
7	Piping Improvements	LS	1	$ 50,000	$ 50,000
8	Backup Generator (500 kW, diesel)	LS	1	$ 200,000	$ 200,000
9	Electrical	LS	1	$ 150,000	$ 150,000
				Construction Subtotal =	$ 1,289,250
				Contingency (10%) =	$ 128,925
				Legal & Administration(5%) =	$ 64,463
				Engineering (15%) =	$ 193,388
				Property/Easement Acquisition =	$ 30,000
				Total =	$ 1,706,025
				Total Estimated Capital Cost =	**$ 1,707,000**

E2 - NYS Route 5 Transmission Main (16" DI)

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL
1	Maintenance and Protection of Traffic Including Signs and Flagmen Meeting NYSDOT Requirements	LS	1	$ 140,000	$ 140,000
2	Mobilization & Bonds	LS	1	$ 140,000	$ 140,000
3	Furnish and Install 16" Dia. CL. 52 DIP Water Main	LF	34,000	$ 135	$ 4,590,000
4	Furnish and Install 16" In-Line Gate Valves Complete	EA	17	$ 4,000	$ 68,000
5	Furnish and Install Hydrant Assemblies	EA	10	$ 4,200	$ 42,000
6	Connection to Existing Main	EA	2	$ 10,000	$ 20,000
7	Directional Drilling with 16-inch HDPE	LF	500	$ 500	$ 250,000
8	NYS Thruway Boring with 42" Casing and 24" Carrier Pipe	LF	0	$ 1,000	$ -
9	Rock Excavation	CY	20,000	$ 100	$ 2,000,000
10	Compaction Testing	LS	1	$ 10,000	$ 10,000
				Construction Subtotal =	$ 7,260,000
				Contingency (10%) =	$ 726,000
				Legal & Administration(5%) =	$ 363,000
				Engineering (15%) =	$ 1,089,000
				Property/Easement Acquisition =	$ 30,000
				Total =	$ 9,468,000
				Total Estimated Capital Cost =	**$ 9,468,000**

E3 - Pembroke Pump Station (Upgrades)

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL
1	Mobilization & Bonds	LS	1	$ 15,000	$ 15,000
2	Instruments & Controls	LS	1	$ 5,000	$ 5,000
3	End Suction Pump (250 HP) w/ VFD	EA	1	$ 200,000	$ 200,000
4	Piping Improvements	LS	1	$ 20,000	$ 20,000
5	Backup Generator (500 kW, diesel)	LS	1	$ 200,000	$ 200,000
6	Electrical Upgrades	LS	1	$ 50,000	$ 50,000
				Construction Subtotal =	$ 490,000
				Contingency (10%) =	$ 49,000
				Legal & Administration(5%) =	$ 24,500
				Engineering (15%) =	$ 73,500
				Total =	$ 637,000
				Total Estimated Capital Cost =	**$ 637,000**

Total Capital Cost (MCWA) = $ 11,812,000