Final Engineering Report

For The

Livingston County Water and Sewer Authority
Leicester/York Regional Water Supply Expansion

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1 Project Background and History

1.1 Introduction and Location

The Livingston County Water and Sewer Authority (LCWSA) has commissioned CPL to prepare an engineering report focused on providing an increase of potable water supply to the municipalities impacted by the AkzoNobel salt mine collapse. These municipalities are the Towns of York, Leicester, Geneseo, Mt. Morris and Avon, and referred to throughout this report as the "impacted municipalities." This report focuses on potable supply, transmission, distribution and storage required to provide increased capacity and reliable drinking water to the impacted communities. Through an examination of the existing water systems in the County, existing water rates, and current and future demands, multiple alternatives will be developed and evaluated to determine the best solution to provide water to the areas that have been affected by the Retsof Salt Mine Collapse of 1994 and the growing communities in Livingston County. The evaluation will take into consideration cost estimates, customer gain, water rates, potential development, energy efficiency, as well as the potential for intermunicipal cooperation to provide water to as many communities as possible.

The Retsof Salt Mine was started in 1885 in Livingston County. The mine, with a footprint of 10 square miles and a depth of 1,200 feet, was owned by Akzo Nobel, Inc. and headquartered in Retsof, a Hamlet in York. On March 12, 1994, an underground collapse occurred when the ceiling of a 500 by 500-foot chamber gave way, causing an earthquake that registered 3.6 on the Richter Scale, according to the U.S. Geological Survey.

As a result of that collapse, methane and hydrogen sulfide gases escaped and ground water flowed into the collapsed area from an aquifer several hundred feet above. Within a quarter mile of the collapse, the lower confined aquifer that crossed the mine experienced a 350-foot water-level decline with aquifer decline experienced further away as well.

In 2014, NYSDEC, the State Attorney General's office and Livingston County signed a $20 million Memorandum of Understanding with Akzo Nobel Inc. to deal with the environmental problems stemming from the 1994 collapse of the Retsof Salt Mine.

The water-level decline and groundwater quality were impacted in the Town of York, Geneseo, and Avon to the north, as well as Leicester and Mount Morris to the south. Funds from this Settlement can be utilized to address the effects of the mine collapse in Livingston County. The LCWSA seeks to provide these existing communities with a safe, reliable water source that can account for both current and future residential and commercial water demands.

The LCWSA currently provides water to the residents in 10 municipalities throughout the County in various districts and from multiple sources. Their main service area, the Consolidated Water District, obtains potable water from the City of Rochester through a connection with their transmission mains in the Town of Livonia near the northern end of Hemlock Lake. This report will also consider sources outside of the LCWSA, including the Village of Avon WTP, the Village

of Mount Morris WTP, the Village of Perry WTP and connections to the Monroe County Water Authority system.

In 2020, Livingston County completed a Comprehensive Water Supply Study to determine existing and future demands throughout the County, and to outline and plan for water needs in the County over the next 30 years. Much of the demand and capacity data in this report has been derived from the Water Supply Study, which can be found in Appendix N.

1.2 Site Information

The project area is scattered throughout Livingston County and environmental resources may vary greatly throughout the project area. Flowing through the middle of the County is the Genesee River, which represents the eastern boundaries of the Towns of York and Leicester, and the northern boundary of the Town of Mount Morris. Many of the residents in these communities that are not currently connected to public water systems in northern half of the County are supplied by wells accessing a basal aquifer. The water quantity and quality available by this aquifer has been negatively impacted due to the Retsof salt mine collapse, which will be described later in this report, in Section 2.1.

Maps showing the wetlands and floodplains in the area can be found in Appendix A.

Each of the public water systems in the County are supplied by surface water sources, described further in Section 1.4. This report will detail the need to expand the existing public water systems and provide affordable surface water sources, with room for development and growth, to the communities in Livingston County. To fully evaluate the environmental impact of such a project, an environmental review will be conducted in accordance with the State Environmental Quality Review Act (SEQRA).

1.3 Ownership and Service Area

Median Household Income data was gathered for the potential communities impacted by this report via US Census to identify the need for financial support.

Median Household Income

Town/Village	2010	2017	2019
Avon (V)	$ 53,287.00	$ 65,598.00	**$67,259.00**
Avon (T)	$ 59,306.00	$ 55,050.00	**$60,625.00**
Geneseo (T)	$ 43,258.00	$ 44,263.00	**$46,112.00**
Groveland (T)	$ 61,397.00	$ 62,273.00	**$77,563.00**
Leicester (V)	$ 55,278.00	$ 63,636.00	**$69,063.00**
Leicester (T)	$ 55,400.00	$ 54,038.00	**$62,083.00**
Lima (V)	$ 47,120.00	$ 56,319.00	**$60,625.00**
Lima (T)	$ 55,500.00	$ 58,606.00	**$64,650.00**
Livonia (T)	$ 59,568.00	$ 64,838.00	**$71,946.00**
Mount Morris (V)	$ 42,813.00	$ 38,098.00	**$41,250.00**
Mount Morris (T)	$ 48,333.00	$ 46,524.00	**$50,511.00**
York (T)	$ 60,000.00	$ 55,101.00	**$60,809.00**
Average	*$53,438.33*	*$55,611.17*	***$58,310.56***

Source: US Census

In accordance with the requirements of most public funding agencies, the overall population of the proposed project area should be analyzed. Historical and projected population data for each Town were obtained from the Genesee/Finger Lakes Regional Planning Council (G/FLRPC) and the U.S. Census Bureau. The historical population (1960-2010) and population projections by the G/FLRPC (2020-2040) are shown in the following table.

Livingston County Population

	Total Population					*Projected Population*				Change (2020-2050)	
Town/Village	**1980**	**1990**	**2000**	**2010**	**2017**	**2020**	**2030**	**2040**	**2050**	**Number**	**%**
Avon (T)	3,179	3,288	3,466	3,770	3,686	3,675	3,755	3,824	3,885	210.0	5.6%
Avon (V)	3,006	2,995	2,977	3,394	3,293	3,207	3,294	3,370	3,438	231.0	7.0%
Caledonia (T)	1,846	2,179	2,240	2,054	2,141	2,091	2,035	1,986	1,942	(149.0)	-7.3%
Caledonia (V)	2,188	2,262	2,327	2,201	2,037	2,376	2,395	2,410	2,425	49.0	2.0%
Conesus (T)	1,970	2,196	2,353	2,473	2,499	2,506	2,564	2,615	2,660	154.0	6.0%
Geneseo (T)	1,927	1,991	2,075	2,452	2,564	2,216	2,271	2,318	2,360	144.0	6.3%
Geneseo (V)	6,746	7,187	7,579	8,031	8,151	8,159	8,382	8,574	8,744	585.0	7.0%
Groveland (T)	2,140	3,190	3,853	3,249	3,344	3,418	3,252	3,107	2,978	(440.0)	-13.5%
Leicester (T)	1,426	1,818	1,818	1,732	1,675	1,923	1,963	1,998	2,028	105.0	5.3%
Leicester (V)	462	405	469	468	463	482	487	491	495	13.0	2.7%
Lima (T)	1,834	2,022	2,082	2,166	1,722	2,178	2,215	2,247	2,276	98.0	4.4%
Lima (V)	2,025	2,165	2,459	2,139	2,445	2,318	2,263	2,216	2,175	(143.0)	-6.3%
Livonia (T)	4,504	5,370	5,913	6,400	6,530	6,334	6,496	6,635	6,759	425.0	6.5%
Livonia (V)	1,238	1,434	1,373	1,409	1,105	1,434	1,456	1,477	1,494	60.0	4.1%
Mount Morris (T)	1,439	1,531	1,301	1,479	1,829	1,323	1,332	1,339	1,346	23.0	1.7%
Mount Morris (V)	3,039	3,102	3,266	2,986	2,511	3,250	3,244	3,238	3,233	(17.0)	-0.5%
North Dansville (T)	1,015	781	906	819	876	938	950	961	970	32.0	3.4%
Dansville (V)	4,979	5,002	4,832	4,719	4,499	4,753	4,723	4,697	4,673	(80.0)	-1.7%
Nunda (T)	1,523	1,584	1,687	1,687	1,523	1,767	1,797	1,823	1,847	80.0	4.5%
Nunda (V)	1,169	1,347	1,330	1,377	1,442	1,343	1,349	1,354	1,358	15.0	1.1%
Ossian (T)	667	797	751	789	786	793	808	823	835	42.0	5.2%
Portage (T)	771	893	859	884	825	880	887	895	901	21.0	2.4%
Sparta (T)	1,458	1,578	1,627	1,624	1,481	1,714	1,747	1,775	1,801	87.0	5.0%
Springwater (T)	2,143	2,407	2,322	2,439	2,252	2,478	2,538	2,590	2,636	158.0	6.2%
West Sparta (T)	1,100	1,335	1,244	1,255	1,373	1,311	1,337	1,360	1,379	68.0	5.1%
York (T)	3,212	3,513	3,219	3,397	3,321	3,312	3,347	3,378	3,405	93.0	2.8%
Livingston County Total	**57,006**	**62,372**	**64,328**	**65,393**	**64,373**	**66,179**	**66,887**	**67,501**	**68,043**	**1,864**	**2.79%**

Source: U.S. Census Bureau and Genesee/Finger Lakes Regional Planning Council Regional Population Forecasts (May 2013)

This project will not impact the entire population of each of the towns and villages listed in the table above. However, it should be noted that the population in each of these municipalities is projected to grow over the next 30 years increasing demand for public water supply.

Municipal Comprehensive Plan and zoning regulations identify where/if economic development of various types is preferred. When determining where development is encouraged, the availability of public infrastructure and the proximity to existing areas of density are the primary drivers. Infrastructure availability can have a significant impact on the type and intensity of development that may occur. Expansions or improvements to public water and/or sewer systems and any potential local economic development opportunities that arise will need to be balanced with overall land development goals to ensure consistency with local plans and regulations. With few exceptions, all the communities in Livingston County have zoning and a Comprehensive Plan to guide land use decision-making.

1.4 Existing Facilities

1.4.1 Sources and Capacities

Approximately 64 percent of Livingston County residents are served by public water, with the remaining 36 percent served by private systems, primarily individually owned wells. Public water supplies consist of various sources, including surface waters such as lakes, reservoirs, and creeks, as well as groundwater wells or springs. Each water system in the County, regardless of the water source, is issued a water system permit and water system ID from New York State. The State Department of Environmental Conservation (NYSDEC) monitors many of these supplies and allocates a set amount of daily water withdraw; local treatment plants are limited in their capabilities by this allocation as well as the individual plants design treatment capacity. In several instances, a single water source is used by several water suppliers (responsible for treatment and transmission), in turn providing water to not only the immediate community but also to outside users ("out of district") or through expansions to the service district.

The water supply sources that are available to serve the Livingston County project area are shown in the below table. Appendix B provides a generalized indication of the extent of the service areas that each water supply provides raw water to, based on watermains and water districts.

Livingston County
Existing Water Sources and Capacity

Source	Water Treatment Facility *Municipality Served*	NYSDEC Water Allocation (MGD)	Treatment Capacity (MGD)	Average Water Usage 2017-2019 (MGD)	Max Water Usage 2017-2019 (MGD)	Available Water Capacity (MGD)
Silver Lake	Village of Mount Morris WTP *Mount Morris (V)* *Mount Morris (T)* *Leicester (V)* *Leicester (T)*	1.50	0.55	0.487	0.760	No Capacity
Conesus Lake	Village of Avon WTP *Avon (V)* *Avon (T)* *Caledonia (T)*	3.5	1.0	0.765	1.1	No Capacity

Livingston County
Existing Water Sources and Capacity

Source	Water Treatment Facility *Municipality Served*	NYSDEC Water Allocation (MGD)	Treatment Capacity (MGD)	Average Water Usage 2017-2019 (MGD)	Max Water Usage 2017-2019 (MGD)	Available Water Capacity (MGD)
Conesus Lake	Village of Geneseo WTP *Geneseo (V)* *Geneseo (T)* *Leicester (T)* *York (T)*	3.0	2.0*	1.004	1.898	0.60
Hemlock/ Canadice Lakes	LCWSA - Consolidated District *Conesus (T)* *Geneseo (T)* *Groveland (T)* *Sparta (T)* *Livonia (T)* *Livonia (V)*	3.0 (not including Livonia(T)) 1.0	3.0	0.119 0.403	0.254 0.840	2.746 .160
	Village of Lima *Lima (V) – Lima (T) WD#2* *Lima (T) – WD #1 & #3*	Purchase Agreement	0.667	0.187	0.637	No Capacity
Lake Ontario	MCWA - Village of Caledonia *Caledonia (V)* *Caledonia (T)*	Purchase Agreement	0.450	0.212	0.445	No Capacity

**Village of Geneseo WTP has an operational capacity of 2.0 mgd, with an additional allocation of 0.5 mgd received from the Livingston County Water and Sewer Authority's Hemlock source in case of emergency*

Source: All data was gathered from each Village and Township in Livingston County, New York State Department of Environmental Conservation and the Livingston County Department of Health

Silver Lake

Silver Lake, located in Wyoming County, is currently used as a source of potable water by the Village of Mount Morris, as well as the Village of Perry in Wyoming County. The area around the lake is populated with residential zoning that provides higher potential for contamination of the surface water source. Silver Lake has routinely experienced late summer algae blooms, having verified blooming events for up to 11 weeks in 2017 and 2 weeks in 2019. These algae blooms create some taste and odor removal problems, as noted by water users. Based on NYSDEC environmental monitoring, Silver Lake has been subject to multiple harmful algae blooms each year that could potentially lead to water treatment difficulties.

Within Livingston County, the Village of Mount Morris provides water not only to the Village and portions of the Town of Mount Morris but also portions of the Town and Village of Leicester. The Village of Mount Morris WTP is permitted by the NYSDEC to withdraw 1.5 mgd daily from Silver Lake. The Village of Mount Morris' pump station near the Silver Lake outlet delivers raw water from two 15-hp pumps, through a 10-inch transmission main, to a 5-million gallon reservoir at the 1 mgd water treatment plant. The raw water transmission main has approximately 5 years or less before major upgrades are required. As water is withdrawn from the Lake, copper sulfate is injected to the raw water to discourage algae growth and the facility periodically injects sodium hypochlorite to discourage zebra mussels prior to being pumped to the reservoir. The treatment facility sees turbidities (cloudiness of water) of around 1.0 NTU (nephelometric turbidity units) and pH ranges of around 8.00 for their treatment processes.

Water from the reservoir then enters the treatment plant and undergoes various processes including coagulation, using a solution of aluminum chloride hydroxide sulfate (a coagulant); clarification; mixed media filtration (anthracite, sand, garnet); corrosion control using blended phosphates; and disinfection using sodium hypochlorite. An in depth description of the treatment process can be found in Appendix C.

Conesus Lake

Conesus Lake is a source of potable water for the municipal water systems within the Villages of Avon and Geneseo, the Towns of Avon and York, and a majority of the Town of Geneseo. The Village of Geneseo also supplies water to portions of the Town of Leicester and the Village of Avon supplies water for portions of the Town of Caledonia. In addition to a potable water supply, Conesus Lake is used for a variety of other purposes including recreation (including boating and swimming), flood control, fish spawning, and a downstream release requirement for the LCWSA wastewater treatment facility located on Conesus Creek.

Like Silver Lake, the area around Conesus Lake is heavily populated with residential and commercial development, including sanitary sewers, which can lead to higher potential of contamination. In May of 2022, a sanitary sewer main break was reported and repaired after raw sewage had entered Conesus Lake. In addition, based on NYSDEC environmental monitoring, Conesus Lake has been subject to between two and seven harmful algae blooms each year since 2014 that could potentially lead to water treatment difficulties. High levels of organics in the water source can cause odor and taste variation and lead to increased levels of disinfection byproducts, which have been experienced and reported by residents. The maximum daily withdrawal allocations from Conesus Lake, determined by the NYSDEC, include the Village of Avon at 3.5 mgd, the Village of Geneseo at 3.0 mgd and the downstream release of 6.46 mgd (10 cfs) for dilution of the LCWSA wastewater treatment plant effluent discharge in Conesus Lake Outlet.

In terms of treatment of raw water from Conesus Lake, takes place at two facilities – in the Village of Geneseo (serving the Village and Town of Geneseo and Town of York) and the

Village of Avon (serving the Village and Town of Avon). The treatment at each of these facilities is outlined below.

Village of Geneseo

Water is drawn into the 2 mgd treatment plant, located along Blue Heron Drive in the Town of Geneseo, through an intake line that extends into Conesus Lake. After filtration, disinfection, fluoridation, and corrosion control processing, the treated water flows into a clear well to achieve the proper chlorine contact time and is then pumped to the distribution system. The depth of the water intake pipe for the Village of Geneseo is at an elevation of approximately 794 feet above sea level. The approximate cost to produce and treat the water is $1.80 per 1,000 gallons (2018). An in-depth description of the treatment process can be found in Appendix C.

Village of Avon

Water from Conesus Lake is pretreated with chlorine to control zebra mussels and then pumped from their pumping facility in Lakeville to their 1 mgd treatment plant at 3262 NYS Route 256. A coagulant is added to remove organic material and the water is then filtered, chlorinated, fluoridated, and corrosion control treatment is added prior to distribution. Prior to being pumped into the distribution system water is stored in a 70,000-gallon clear well in Lakeville. The depth of the water intake pipe for the Village of Avon is located on the north side of the lake at an elevation of approximately 803 feet above sea level. The approximate cost to produce and treat the water is $1.86 per 1,000 gallons (2018). The water treatment plant has approximately 5-10 years before some upgrades will be required. An in-depth description of the treatment process can be found in Appendix C.

Hemlock and Canadice Lakes

Since 1876, Rochester residents have relied upon Hemlock and Canadice Lakes for their drinking water supply. Though these are two separate physical lakes, they are connected through conduits to the Hemlock Filtration Plant and act as one single water source. Both of these lakes are largely undeveloped, and City of Rochester has acquired most of the watershed property around the lake to continue the protection of the water source.

The average annual allowable daily demand from Hemlock and Canadice Lakes is 37 mgd with a maximum daily demand of 48 mgd. The Hemlock Filtration Plant is a direct filtration plant with a capacity of 48 million gallons per day and employs processes involving pH adjustment, coagulation, filtration, disinfection, and fluoridation. Water treated at the Hemlock Filtration Plant flows to the City of Rochester by gravity through three large pipelines.

Along the way, water is sold wholesale to water districts in the Town and Village of Lima, Livingston County Water and Sewer Authority (LCWSA), and Monroe County Water Authority (MCWA). LCWSA has a maximum daily withdraw allocation of 3.0 mgd, and the Town of Livonia, which is assigned to the LCWSA, has a separate water withdraw allocation of 1.0 mgd. In total, LCWSA has a maximum daily withdraw allocation of 4.0 mgd from the City of Rochester. LCWSA's Hemlock pump station supplies water to the services area described above. The Hemlock pump station has approximately 20-30 years before any major upgrades are required. The Village of Lima has their own pump station that supplies the Village of Lima and a portion of the Town of Lima.

Lake Ontario

The Monroe County Water Authority (MCWA) services Monroe County and portions of each of the five surrounding counties. Their service area includes over 50 towns, villages, cities, and other water authorities. Within Livingston County, the Village and Town of Caledonia is the only community receiving water from MCWA through a connection and pump station in the Town of Wheatland. This pump station in the Town of Wheatland (Caledonia/Mumford pump station) has recently been built in 2020 has approximately 30 years or more before any major upgrades will be required.

MCWA's primary source of water is Lake Ontario. The water is treated at the 150 mgd Shoremont water treatment plant in the Town of Greece, and the 50 mgd Webster water treatment plant in the Town of Webster. MCWA's other major source of water consists of water purchases from the City of Rochester pursuant to an existing exchange agreement. This water comes from Hemlock and Canadice Lakes in Livingston County south of Monroe County. Water treated by MCWA is also supplied to the neighboring Genesee County. Currently, Genesee County is investing in its system (Phase 2 and 3) which will increase supply within their borders. Utilization of MCWA/Genesee County water within Livingston County will require a significant level of investment as Genesee County is currently facing an estimated $153,000,000 to build out the above-mentioned phases, expand infrastructure, make improvements to existing facilities.

1.4.2 Existing Distribution Systems

In addition to water sources and treatment facilities, public water systems also include storage and a distribution network. This section of the report provides a brief summary of these aspects. A map of the existing water systems can be found in Appendix D.

Village of Mount Morris

The Village of Mount Morris stores raw water at their water treatment plant in a 5,000,000-gallon reservoir. A 1,000,000-gallon clear well is located below grade at the treatment plant to store the treated water. The Village's distribution system is fed by gravity from the

clear well. In the past 5 years, the Village of Mount Morris has replaced 98 percent of the water meters in the Village and Town Mount Morris.

Town of Mount Morris

The Town of Mount Morris water system consists of Water District #1. The Town of Mount Morris operates and maintains Water District #1 and owns, operates, and maintains a transmission main in the Town of Mount Morris along NYS Route 408, connecting the Village of Mount Morris to the ARS Service area (LCWSA owned and operated) in the Town of Groveland. The Town of Mount Morris owns the services along the transmission main within Town limits. All water users in Water District #1 are gravity fed from the Village of Mount Morris treatment plant.

Letchworth State Park, which is partially located in the Town of Mount Morris, also receives water from the Village of Perry WTP, servicing a public swimming pool and recreation area. As of June 2021, the New York State Office of Park, Recreation and Historic Preservation was placed under administrative order by the US Environmental Protection Agency due to the high levels of disinfection byproducts in the public water from Silver Lake. The NYSHPO has had to increase flushing practices, sampling and data analysis in order to modify their chlorination practices to comply with the administrative order. The administrative order for Letchworth State Park can be found in Appendix E.

Village of Leicester

The Village of Leicester has a connection to the Village of Mount Morris water system on NYS Route 36, where water is pumped into Leicester through a 6-inch transmission main. A 200,000-gallon water storage tank located on Leicester Road (NYS Route 20A) feeds Leicester by gravity and provides fire flow. The Village Leicester is under contract with the Village of Mount Morris until 2026.

The Village (and Town) of Leicester can meet demands throughout the year under current circumstances (i.e. extent of businesses/housing), but there is concern during the summer and fall months due to increased operations at Seneca Foods on NYS Route 36. During this time, crop harvesting is higher and water demand at the facility increases and water distribution operations within the Village can be difficult because of pressure drops throughout the Village.

Town of Leicester

The Town of Leicester consists of several water districts. The Old Leicester-Cuylerville District is supplied from the Village of Mount Morris (Silver Lake) along with several district extensions. The York-Leicester District along Caledonia Road is supplied from the Town of York (Conesus Lake). The Towns of Leicester and York also completed a second

intermunicipal project providing water to residents on NYS Route 36 north of the Village of Leicester.

The Town of Leicester system includes a 250,000-gallon water storage tank off Caledonia Road and there are four (4) master meters located on South Street, York Road, Cuyler Road, and Jones Bridge Road are owned by the Village of Leicester and monitor flows to the sections of water main with dead ends. The existing water tank has reached the end of its useful life based on inspection by the Department of Health, which can be found in Appendix F. The Town has also consistently experienced high disinfection byproducts and has been placed on consent order by the Environmental Protection Agency, which can be found in Appendix G.

The Town of Leicester's York-Leicester District along Caledonia Road and the Route 36 District are both supplied from the Town of York (supplied from Conesus Lake). Water users within this District are served by gravity from the Town of York. Water within the Town of Leicester district does not mix with the remainder of the Town of York, as a closed valve exists at the south end of Caledonia Road keeping sources separate.

American Rock Salt (ARS) Service Area

LCWSA operates and maintains the ARS/Groveland water system (supplied from Hemlock Lake) in the Northwest corner of the Town of Groveland. The area is fed by the Maple Beach Pump Station and includes a 250,000-gallon water storage tank (ARS tank) located on East Groveland Road provide water to users in the service area.

Village of Avon

The entire Village of Avon is serviced by public water. The distribution system consists of a 2,000,000-gallon storage tank and a 270,000-gallon storage tank located on Reservoir Road and the water treatment plant on Route 256, respectively. Water is fed throughout the system by gravity from each tank location. The Village of Avon water system serves Barilla America and Kraft Foods, two major food processing facilities that require large demands of 30,000 gpd and 80,000 gpd, respectively. The Village and Town of Avon have recently completed an interconnection with the Village and Town of Lima for backup and emergency purposes.

Town of Avon

The Town of Avon consists of one (1) consolidated water district and the South Avon water district. The South Avon district is operated and maintained by LCWSA, and the consolidated district is operated and maintained by the Town of Avon. The South Avon district was completed due to the Retsof salt mine collapse, as the properties in the area lost their groundwater supplies. The Town of Avon storage facilities include two (2)

storage tanks—the Town Line 500,000-gallon tank off NYS Routes 5&20 and the East Avon 100,000-gallon tank in the Hamlet of East Avon. In the 2018 water supply inspection report conducted by the Livingston County Department of Health (DOH), the following observations were made at the East Avon elevated storage tank: exterior needs to be re-painted, the roof vent needs to be repaired or replaced, and the exterior safety equipment is not up to current code and should be replaced.

Village of Caledonia

The Village of Caledonia receives water from MCWA through the hamlet of Mumford through a new pump station located on NYS Route 36. This pump station and an emergency connection on NYS Route 5 are operated and maintained by MCWA. The remainder of the system is operated and maintained by the Village of Caledonia. Water is distributed throughout the Village system with a 400,000-gallon water storage tank located on Gas Light Lane, off Graney Road.

Town of Caledonia

The LCWSA purchases water from the Village of Avon to serve properties along NYS Route 5 in the Town of Caledonia. This area is referred to as Caledonia District #3. There are only 12 service connections, serving approximately 160 customers.

The Town of Caledonia Water District No. 1 is connected to the Village of Caledonia system. The main is fed by gravity from the Village of Caledonia storage tanks. There are 30 service connections, serving approximately 93 customers. Water District #1 is operated and maintained by LCWSA.

Village of Geneseo

A pump station located at the Village of Geneseo water treatment plant pumps treated water to a 3,000,000-gallon concrete water tank located on Reservoir Road, which is owned and operated by the Village. The remainder of the distribution system after the water storage tank is served by gravity. The Village of Geneseo has an agreement with LCWSA in which LCWSA would supply up to 0.5 mgd to the Village in the event of an emergency through an interconnection on West Lake Road at the Livonia/Geneseo town line.

Town of Geneseo

The Town of Geneseo water system is made up of Water Districts #1 through 6. Water Districts #1, 2, 4, 5, and 6 are supplied from the Village of Geneseo. The distribution system in Districts #1, 2, 4,5 and 6 is served by gravity from the Village of Geneseo 3,000,000-gallon water storage tank located on Reservoir Road with the exception of a portion of Water District #2 that is served by the Town of Geneseo's 250,000-gallon water

storage tank located on Burbank Drive. The Burbank Drive water storage tank operates on a higher hydraulic grade than the remainder of the Town of Geneseo system due to the higher ground elevation in the surrounding area.

LCWSA provides water to the Town of Geneseo Water District #3 by gravity through two (2) water storage tanks in Livonia—the Lakeville and Airport (Pebble Beach Road) water storage tanks. These tanks have the capacity for 250,000 and 500,000 gallons of water, respectively.

Town of York

The Village of Geneseo provides water to the Town of York through a transmission main on State Route 63. The Town of York distribution system has expanded and improved in the last five (5) years since 2014 to include a consolidated district with additional service areas and extensions. A new high-pressure zone service area was added to the system as part of the 2016 Water Systems Improvements project that was driven by Noblehurst Farms and WNY Cheese Enterprise high water demands. As a result of this project, new water main was installed along Craig Road, Stewart Road, and Linwood Road (County Road 23).

In addition, the new Tuttle Road pump station was installed to fill the new Peoria (500,000 gallon) water storage tank located near Orrs Corner which feeds the new high-pressure zone. Two pressure reducing valves were also installed at the high-pressure zone connections on Craig Road and Linwood Road. The remainder of the system is served by gravity through the two (2) Tuttle Road (500,000 gallon) water storage tanks.

Town of Conesus

The Town of Conesus is served through two master meters at the Town of Livonia and Conesus boundaries on East Lake Road and South Livonia Road. Water users in the Town of Conesus are served by gravity via a combination of three (3) water storage tanks connected to the distribution network. These tanks include the Niver Road tank (250,000 gallons), the Railroad tank (160,000 gallons), and the Sliker Hill tank (500,000 gallons).

Town of Groveland

In 2019, LCWSA completed the DOCCS water project which connected West Lake Road to Maple Beach Road and extended to the Livingston County Correctional Facility in the Town of Groveland with approximately 50,000 linear feet of 12-inch water main. The water main is supplied through the new Maple Beach pump station, located just off West Lake Road on Maple Beach Road. As a result, users along West Lake Road in the Town of Groveland, previously served by the Town of Geneseo, are now serviced by LCWSA, though no formal district exists at this time. In addition to the water main, a new 500,000-

gallon water storage tank (Dennison Road tank) and two (2) pressure reducing valves were installed to maintain proper pressure through the new transmission main.

Groveland Station is served from LCWSA's Consolidated District through Scottsburg in the Town of Sparta. Two 150,000-gallon water storage tanks, the Upper and Lower Groveland Station tanks, with the combination of two pump stations, supplies Groveland Station and up Groveland Hill Road. Residents served by LSWCA are part of LCWSA's Consolidated District.

Village of Livonia

The Village of Livonia is supplied by LCWSA's Consolidated District through 10-inch and 16-inch water mains running parallel along Big Tree Road/State Route 20A. The 16-inch water main was installed as part of the DOCCS project to allow additional flow in the system. The Hemlock pump station and the Shelly Road water storage tank (500,000-gallon capacity) feed the Village of Livonia, which creates a higher-pressure zone within the distribution network; the portion in the Town of Livonia, west of the Village, is a lower-pressure zone. The Village's distribution system operates by a combination of gravity and pumping operations to provide adequate pressures. The water system in the Village of Livonia is a standalone water district from the LCWSA Consolidated District referred to as the Village of Livonia District.

Town of Livonia

The Hemlock pump station, located in the Hamlet of Hemlock, feeds the entire LCWSA Consolidated District in the Town and the Village of Livonia. The pump station is located off Big Tree Road/State Route 20A in the Town of Livonia at the connection to the Hemlock transmission mains. A 150,000-gallon water storage tank, referred to as the Hemlock tank, is located at the intersection of NYS Route 20A and Big Tree Road. This tank specifically serves the area south of Big Tree Road along NYS Route 20A with a pressure reducing valve and control valve located outside of the Hemlock tank to reduce pressure for this service area. Just south of Big Tree Road, along Shelly Road, is the Shelly Road pump station and the 500,000-gallon Shelly Road water storage tank.

On the west side of the Village of Livonia are two (2) pressure reducing valves on Big Tree Road and Stone Hill Road. The Town of Livonia water system west of the Village of Livonia is on a lower pressure zone with two (2) additional water storage tanks servicing this area. The Lakeville tank on NYS Route 20A has a capacity of 200,000 gallons and the Airport tank has a capacity of 150,000 gallons.

Village of Lima

The Village of Lima owns a pump station at the northern Town of Lima line along NYS Route 15A. This pump station supplies water to the Village of Lima and fills their 500,000-gallon storage tank at the north end of the Village. The rest of the system is then fed by gravity from the storage tank. Water capacity in the Village of Lima is restricted by the existing connection point on NYS 15A. The Village and Town of Lima recently completed and emergency interconnection on NYS Route 5 and 20 to the Village and Town of Avon water system, giving them an emergency backup connection and source.

Town of Lima

The Town of Lima receives water from the City of Rochester. There are four (4) water districts in the Town; Water Districts #1, 2, 3, and 4. The majority of the water main running along NYS Route 15A is 12-inch ductile iron, with the exception of a small portion near Slocum Road where the water main reduces to 8-inch ductile iron. This area is referred to as water District #2. Water Districts #1 and 3 are located along the following roads: Ideson Road, Martin Road, York Street, and Bromley Road. Districts #1 and 3 have a separate connection directly to the City of Rochester's Hemlock Lake transmission mains. District #4 if is located off of Dalton Rd. in the Village of Lima.

1.5 Demands

As the communities in Livingston County continue to grow, develop and age, concerns arise regarding the capacity of each of the water systems. Currently, water suppliers in Livingston County produce and/or purchase an average of approximately 3.80 mgd with max day usage reaching up to 7.50 mgd. Any capacity concerns described above do not necessarily imply that there is an insufficient quantity of water from the existing sources to meet demands on an overall County-wide basis. Instead, it indicates that either intermunicipal agreements could potentially be negotiated to supply water where it is needed or that new water sources and/or expanded treatment plants could be developed to meet the demands.

Projected demands over the next 30 years are based on population growth and subsequent residential and economic development. It is reasonable to say that 2/3rd of existing and projected population has a desire for public water, therefore the 2050 projected water demand was based on 66% of the municipalities being connected to public water sources, with demands of 180 gpd per household. Economic development can vary but based on the projected uses of each of the five (5) industrial development areas in the County and the potential uses of future economic development areas (in conjunction with adopted comprehensive plans), water demand was determined assuming full build-out in these areas. Growth in the existing Villages is limited since a majority of the residents currently have public water, but some growth can continue with economic development and the existence of SUNY Geneseo. Given the limited availability for future development in most Villages in the County, projected residential max day demands were determined using the current ratio of average usage to max day usage.

Project Area Projected Demands

Source	**Municipality**	**Max Daily Usage (MGD)** *(2019)*	**Projected Max Daily Usage (MGD)** *(2030)*	**Projected Max Daily Usage (MGD)** *(2040)*	**Projected Max Daily Usage (MGD)** *(2050)*
Mount Morris WTP	(V) Mount Morris	0.46	0.48	0.50	0.525
	(T) Mount Morris	0.049	0.10	0.15	0.206
	(V) Leicester	0.20	0.23	0.26	0.295
	(T) Leicester	0.035	0.11	0.18	0.248
Avon WTP	(V) Avon	0.58	0.59	0.60	0.61
	(T) Avon	0.513	0.66	0.80	0.95
	(T) Caledonia	0.01	0.02	0.02	0.03
City of Rochester via Hemlock PS	(T) Conesus	0.075	0.18	0.29	0.40
	(T) Groveland	0.075	0.55	1.02	1.49
	ARS	0.05	0.05	0.05	0.05
	(T) Sparta	0.016	0.03	0.05	0.06
	(T) Livonia	0.65	1.20	1.75	2.30
	(V) Livonia	0.19	0.40	0.61	0.82
City of Rochester Lima PS	(T) Lima	0.078	0.13	0.18	0.236
MCWA-Lima	(V) Lima	0.559	0.57	0.58	0.595
MCWA-Caledonia	(V) Caledonia	0.445	0.51	0.58	0.646
Geneseo WTP	(V) Geneseo	0.91	1.02	1.14	1.25
	(T) Geneseo	0.322	0.41	0.51	0.60
	(T) York	0.96	0.94	0.93	0.91
	(T) Covington	0.05	0.06	0.07	0.08
	Total	6.23	8.24	10.27	12.30

1.6 Existing Water Rates

Water billing for the LCWSA is based on the rate structure established. The LCWSA charges users a quarterly base rate depending on location of the user. The current rate structure can be found in the below:

2022 LCWSA Water Usage Rates

	Water Rates	
	Annual Per Unit Rate	**Consumption Rate (per 1,000 gallons)**
Town of Conesus	$148.00	$3.54
Town of Livonia (S Livonia, Lakeville, Hemlock, E Lake Rd)	$148.00	$3.35
South Livonia Rd (Out of District)	$148.00	$3.54
Scottsburg (Out of District)	$148.00	$3.54
Town of Groveland	$148.00	$3.54
Town of Geneseo (Out of District)	$148.00	$3.54
Village of Livonia	$252.00	$7.55

The resulting cost for the typical single-family user in the Consolidated Water District is approximately $360 per year based on an average annual usage of 60,000 gpd. Water rates for the other water systems in the County are shown below.

2022 Town and Village Water Usage Rates

	Water Rates	
	Annual Per Unit Rate	**Consumption Rate (per 1,000 gallons)**
Village of Leicester	$260.00	$3.95
Town of Leicester	$100.00	$6.50
Village of Mount Morris (<10,000 gallons)	$170.00	$2.75
Village of Mount Morris (>10,000 gallons)	$170.00	$3.00
Town of Mount Morris	$165.40	$5.25
Town of York (<20,000 gallons)	$117.40	$5.01
Town of York (>20,000 gallons)	$117.40	$5.00
Town of Geneseo	$120.00	$4.50

2 Need for Project

In 2020, the County completed the Livingston County Water Supply Update Study (Appendix N) in order to investigate the future requirements for potable water in the area, taking into account demand growth, supply quality and quantities, environmental concerns, and potential rate changes. The study identified multiple needs throughout the County for expanding sources and creating redundancy in transmission in the County in order to continue to provide reliable safe drinking water to residents. This report incorporates the concerns outlined in the study to develop a project that will help provide consistent, safe drinking water to customers throughout the County at a reasonable rate.

2.1 Retsof Salt Mine Collapse

The Retsof Salt Mine was started in 1885 in Livingston County. The mine, with a footprint of 10 square miles and a depth of 1,200 feet, was owned by Akzo Nobel, Inc. and headquartered in Retsof, a Hamlet in York. On March 12, 1994, an underground collapse occurred when the ceiling of a 500 by 500-foot chamber gave way, causing an earthquake that registered 3.6 on the Richter Scale took place in the area, according to the U.S. Geological Survey. The location of the collapse and salt mine area can be found in Appendix H.

As a result of that collapse, methane and hydrogen sulfide gases escaped and ground water flowed into the collapsed area from an aquifer several hundred feet above. By the end of 1995, the mine was full of water highly saturated with salt. Since that time, the weight of rock above the mine has been squeezing it shut, forcing the brine out and upward through two openings that came into existence after the collapse. This process is expected to continue for hundreds of years. USGS geologists warned in the early 2000's that the rising salt water could seep into an aquifer several hundred feet above the mine, ruining it as a potential source of drinking or irrigation water. This event did, in fact, occur as a USGS study (Appendix H) indicated that wells within an 8-mile vicinity of the collapse experienced increased dissolved gas, brine water, or a decline in water levels within existing water wells. Within a quarter mile of the collapse, the lower confined aquifer that crossed the mine experienced a 350-foot water-level decline with aquifer decline experienced further away as well.

The communities affected by the event were the Town of York, Geneseo, and Avon to the north, as well as Leicester and Mount Morris to the south. Due to the collapse, Akzo Nobel Inc. was required to correct the issues in these communities caused by the contamination of the aquifer. A settlement award of $20 million was awarded to the County and separated into 4 categories:

- $11,000,000 dedicated to surface water and water supply infrastructure, repair and maintenance (Livingston County).
- $5,000,000 dedicated to surface water and water supply improvement projects to protect the drinking water sources for the communities impacted by the mine collapse (Livingston County).

- $1,000,000 will provide a contingency fund to address potential future harm related to the collapse (Livingston County).
- $3,000,000 dedicated to monitoring groundwater and subsidence within the affected area (NYSDEC).

2.2 Existing Source Capacity & Future Growth

As the County continues to grow and demands rise, the sources of water will need to expand and grow as well. The chart below shows the existing capacity for each source providing water to the project area, as well as the demand for the communities that receive water from each source. The surplus and deficit for each for 2020 (existing), 2030, 2040, and 2050 show the need for capacity expansion over the next 30 years. Although some of these municipalities have deficits, intermunicipal agreements can help to alleviate some of the capacity needs in the short term, at lower expenses. As growth progresses, investments in sources will need to expand.

2.3 Existing Source Condition

Each of the existing water treatment plants within Livingston County (does not include City of Rochester WTP) are exceeding their permitted capacity during peak demand and require significant capital investment in order to expand capacity. In addition, many of the treatment plants and pump stations require improvements to extend their useful life at their existing capacities. This section will outline the needs of each of the facilities as far as maintenance and capital projects in the near future.

Village of Mount Morris WTP

The Village of Mount Morris relies upon a raw water transmission main that runs over six (6) miles to Silver Lake including a single crossing of the Genesee River. Failure of this transmission main would result in water shortages in the Village of Mount Morris, the Village of Leicester and portions of the Towns of Mount Morris and Leicester. The raw water transmission main from Silver Lake has a limited and unknown lifespan before any major upgrades are required. The transmission main dates back to 1914 and has required some repairs and improvements. Due to the age of the raw water transmission main, there is a significant amount of time and effort needed to maintain operation in the system.

The Village also has needed improvements to the water treatment plant. These improvements include air scour system for the intake, mixing and aeration system in the treatment plant reservoir, replacement of weirs, construction of a third filter, replace valve on backwash pumps, addition of a vacuum priming system, addition of new controls, replacement of sludge equipment, baffling in the clear well to increase chlorine contact time and instrumentation improvements to improve flow rate. Many of these items have been outlined by the Department of Health in letters identifying the filtration deficiencies and low chlorine contact times. The letters can be found in Appendix I. A detailed description of these upgrades can be found in Appendix C.

Village of Avon WTP

Conesus Lake is the source of supply for the Village of Avon water treatment plant and the Village of Geneseo water treatment plant. The Village of Avon supplies treated water to approximately 6,300 customers in the Village and Town of Avon, and a small portion of the southeast corner of the Town of Caledonia. Water supplied from the Village of Avon currently meets all regulatory requirements.

There is currently no redundant interconnection or source of supply for the Village of Avon supply. The Village of Avon and Town of Avon recently constructed a supplemental interconnection with the Village and Town of Lima consisting of an 8-inch water main. The Village is currently in the process of replacing the Pebble Beach pump station due to its age and the potential impact on the system as this pump station is the only supply for the Village's WTP. A detailed description of these WTP upgrades can be found in Appendix C.

Village of Geneseo WTP

The Village of Geneseo 2.0 mgd water treatment plant is adjacent to Conesus Lake. Treated water is pumped from the treatment plant to a 3,000,000-million-gallon storage tank on Reservoir Road and the remainder of the Village distribution system is fed by gravity for this tank. Approximately 12,600 customers are served by the Village of Geneseo WTP including the Town of Geneseo and York, with approximately 8,000 customers in the Village alone. Water supplied from the Village of Geneseo water treatment plant currently meets all regulatory requirements.

There is a supplemental connection to the LCWSA Consolidated District (Hemlock Lake) at West Lake Road and Reservoir Road in the Town of Geneseo. The Village of Geneseo has an agreement with the LCWSA to provide up to 0.50 mgd to the Village in the event of an emergency.

The Town of York is also supplied by the Village of Geneseo's WTP, and fed through a single feed, a booster pump station that pumps water to a 500,000-gallon water storage tank. The pumps in this station have reached the end of their useful life and the Town of York is planning a project to replace the pumps and provide a more reliable feed to the 2,130 residents supplied by this single feed.

LCWSA Hemlock Pump Station

The LCWSA supplies potable water through the Hemlock pump station from Hemlock and Canadice Lakes (Town of Caledonia and the ARS service area not included) to a total of 3,500 residential and commercial customers in the Towns of Conesus, Geneseo, Groveland, Livonia, Sparta, West Sparta, and the Village of Livonia. There is no residential development on the shore of either Lake. The City of Rochester water treatment plant is currently meeting all regulatory water quality standards.

There are no interconnections in LCWSA's system capable of providing redundant or supplemental supply for users in the Consolidated District. The City of Rochester system in Monroe County is interconnected to the Monroe County Water Authority Lake Ontario supply. At the present time, it is not hydraulically possible to supplement Livingston County users from the Lake Ontario supply through the Hemlock transmission mains.

The LCWSA Consolidated District does have many redundant components including connections to both City of Rochester conduits, parallel transmission mains to the Village of Livonia, and a looped network to the communities at the southern end of the system. However, the loop completed around the lake is not complete due to closed valves on West Lake Road as the LCWSA and Town of Geneseo systems are kept separate for billing purposes. There are several supplemental interconnections that could be easily considered

and implemented including connections to the Village of Avon WTP, Village of Geneseo WTP, and Village of Lima pump station.

Village of Lima Pump Station

The Village of Lima is supplied by the City of Rochester (through MCWA) along NYS Route 15A at the northern Town of Lima line. A pump station at this location fills a 500,000-gallon storage tank and serves approximately 2,290 customers in the Village. Water supplied from the City of Rochester currently meets all regulatory requirements. A connection to the Town and Village of Avon (Conesus Lake) supply was recently completed along NYS Route 5 & 20 for emergency and supplemental supply purposes only. Without significant upgrades to both the Village of Avon WTP and Village of Lima pump station, this interconnection would not have the ability to provide a redundant supply. With significant capacity increases, there is significant potential to provide secondary supply to several water systems through the Village pump station.

MCWA Mumford Pump Station

The Village and Town of Caledonia purchase treated water from the Lake Ontario/MCWA supply. Approximately 2,300 customers are supplied from this source combined in the Village and Town of Caledonia. The Village of Caledonia is supplied from the Monroe County Water Authority System through a new pump station constructed in 2020 in the Hamlet of Mumford, just north of the Village on NYS Route 36. The Village serves approximately 2,201 customers, as well as approximately 93 customers in the Town of Caledonia Water District #1. Water supplied from the MCWA currently meets all regulatory requirements.

2.4 Water Rates

The wholesale water rates in the surrounding communities have been considered as well, in order to determine if a project will provide potential savings to the residents. The following table shows the existing wholesale rates based on purchase agreements for the Towns and Villages looking to expand their water supply.

Community Wholesale Water Rates

Municipality	Water Supplier	Existing Wholesale Water Rate per 1,000 gallons
Village of Leicester	Village of Mount Morris	$4.02
Town of Leicester	Village of Leicester (via Village of Mount Morris WTP)	$5.50
Town of Mount Morris	Village of Mount Morris	$4.25
Town of York	Village of Geneseo	$3.54
Town of Geneseo	Village of Geneseo	$3.54

In addition to the increased capacity, impacted communities are also interested in reduced wholesale water rates. Alternatives will compare the existing rates to the project rates based on the cost estimates

2.5 Consolidation and Redundancy

Throughout the County, many of the residents are supplied potable water by separate water sources, which do not provide significant redundancy. Each of these water systems requires its own operation and maintenance plan, and each must continually invest in capital projects to maintain the ability to provide reliable water to their communities. By installing interconnections between the individual water systems, multiple benefits for the municipalities can be realized.

As demands grow in the future, the County as whole will be required to invest in capacity increases to achieve peak flows. By consolidating systems, cost savings and efficiencies will be available when constructing new infrastructure, whether it is larger pump stations, or expansion of existing treatment capabilities. In addition, interconnection between Towns and Villages can provide more complete backup and redundancy for water users in the project area and give the ability to provide more capacity between different areas that currently have surplus versus deficits.

Consolidation will also improve long term operational costs, creating efficiencies in purchasing of equipment, staffing, and other annual costs that could be dispersed over more customers. County-wide shared services could simplify operations and eliminate deficiencies within some water systems in Livingston County. Some of the main items that would be included are billing, water related purchases, and operations. Pooling resources and streamlining operations and decision making can greatly increase efficiency, reduce costs, and increase water quality.

As part of the alternative development of this project, strong consideration has been taken into how to provide water most efficiently to new users of the County in need, as well as how to interconnect and bring together the existing potable water customers of each system.

3 Proposed Alternatives

3.1 Source Alternatives

Village of Avon WTP Expansion

The capacity of the Village of Avon WTP is currently at the required peak daily demand for the area it serves. To provide water to the growing area, the Village of Avon could expand their existing WTP from a 1.0 mgd capacity to 2.0 mgd. The project would require the addition of a new filter as well as the necessary building and piping expansion to accommodate. In addition, new piping will be required to assist in higher chlorine contact time before being sent out to the water system. This would include approximately 6,500 linear feet of 20-inch water main to provide the required volume of water. The proposed upgrades and cost estimates completed by MRB Group for the required work can be found in Appendix C.

The proposed estimate for this expansion is $7,100,000.

Village of Mount Morris WTP Expansion

The Village of Mount Morris WTP is nearing its limits to provide enough potable water to its service area. With planned projects in the Town of Mount Morris, and the high peaks at the Seneca Food facility, the 0.9 mgd capacity will be used up in the next few years. In addition, equipment including filters and the raw water transmission main are in immediate need of repair or replacement.

To expand the facility by an additional 1.0 mgd to service more customers, a new filter would need to be added as well as piping and building accommodations. The existing 58,000 linear foot raw water transmission main from Silver Lake will also need to be replaced with a new 12-inch main. The proposed upgrades and cost estimates completed by MRB Group for the required work can be found in Appendix C.

The proposed estimate for this expansion is $17,000,000.

New LCWSA Pump Station (City of Rochester Source)

In order to provide a greater capacity to the County, this alternative proposes the construction of a new booster pump station connected to the City of Rochester conduits. The new pump station could be located in either the Town of Lima, or adjacent to the Town of Livonia in the Town of Richmond (Ontario County). This pump station building would be sized to provide capacity for the forecasted demand in 2050, with the ability to phase the installation of the pump equipment to save on initial capital costs. Multiple options for this alternative based on capacity will be considered, including 4 mgd, 5 mgd and 6 mgd, depending on the other alternatives selected around the County.

The proposed estimate for a 4 mgd pump station is $2,500,000.

The proposed estimate for a 5 mgd pump station is $3,000,000.

The proposed estimate for a 6 mgd pump station is $3,500,000.

Hemlock Pump Station (LCWSA) Expansion

The existing Hemlock pump station is capable of delivering up to 3.0 mgd. In 2016 the station was upgraded to include new pumps capable of delivering enough flow to provide the required supply to the Town of Groveland and DOCCS. Since the upgrade, the actual demand from the DOCCS site has been significantly lower than expected, leaving some extra capacity for additional users in the existing system. However, in order to supply flow to the rest of the County, and accommodate growth through 2050, the LCWSA will need to increase their supply capacity. At the site of the existing Hemlock pump station, where a tap into the City of Rochester pipelines already exists, a new pump station building could be constructed to increase the pumping and supply capabilities for LCWSA. An additional 3 mgd pump station will be considered at this site, to bring the total capacity of the station to 6 mgd.

The proposed estimate for an additional 3 mgd pump station is $2,000,000.

MCWA Covington Connection

Currently, residents of the Town of Covington Water District #1 (located in Wyoming County) receive water from the Town of York, supplied by the Village of Geneseo, a demand of approximately 50,000 gpd. Adjacent to the Town of Covington, is the Town of Pavilion in Genesee County, who have recently constructed a new 300,000-gallon tank to serve residents in the Southeast area of the Genesee County. With minimal piping and valve installation, it would be hydraulically possible to transfer the service of the Town of Covington from the Town of York to the MCWA supply in Pavilion. This would relieve some of the strain on the Village of Geneseo WTP providing water to the customers in the Town of York. Some upgrades may be required further upstream in Genesee County to make this supply possible, as well as approval from MCWA.

The proposed estimate for this alternative is $350,000.

MCWA Caledonia Connection

In 2020, the MCWA recently altered the supply channels to the Village of Caledonia. Previously, water was supplied through Genesee County, via Route 5 and the Village of LeRoy. In order to free capacity in Genesee County for their use, a new pump station was constructed in the Hamlet of Mumford to supply potable water directly from Monroe County. The new pump station was

designed for the existing and future flows of the Village of Caledonia, and the existing Town users connected to that system. In order to be able to supply more flow to Caledonia, this new pump station would need to be expanded to supply more MCWA water to the residents of Livingston County, including new pumps, electrical supply, generator. The pump station could be expanded to serve more residents of the Town of Caledonia, and possible some members of the Town of Avon, approximately 0.5 mgd more.

The proposed estimate for this alternative is $750,000.

3.2 Transmission Alternatives

Livonia Transmission Main

With the increased source capacity required in the County, and the existing infrastructure already in place, larger diameter pipes may be required to convey water from the East side of the County to the West side. If a new pump station is constructed, or the Hemlock pump station is expanded, a new transmission main can be constructed to push water through the northern part of the County, through the Towns of Livonia, Lima, Avon, Geneseo, and eventually connecting to the existing Town of York system. This transmission main would be approximately 15 miles to convey water to the residents of the West side of the County.

Another consideration with the transmission main route is the potential to create a shared project between the LCWSA and the Towns in the area. Many of the Towns are in the process of building out their water systems and are expected to develop Town water projects to serve residents of the community that currently do not have public water. The LCWSA could contribute to these Town projects in order to upsize water mains from 8”-12” distribution mains to larger diameter 16”-24” water mains, which would result in savings and efficiencies for the water users.

Depending on the other improvements and expansions made to the system, multiple pipe sizes will be considered for this Alternative.

The proposed estimate for a 16” transmission main is $15,840,000.

The proposed estimate for a 20” transmission main is $21,120,000.

The proposed estimate for a 24” transmission main is $25,740,000.

River Road Transmission Main

As one of the requirements of the funding provided to Livingston County due to the Salt Mine collapse, the LCWSA has worked to try to provide public water to the residents in the area directly affected by the contamination or depletion of the existing aquifer. While some of the residents in the affected area have been provided some sort of public water or funding to improve their well

treatment. However, there are multiple areas in the Town of York and Town of Leicester that could still be provided with public water, specifically along River Road.

In addition, as demands grow on the west side of the County, and potential sources for the Town of York, Town and Leicester and Mount Morris and Villages of Leicester and Mount Morris change, the need for transmission between these municipalities will increase. A new transmission main that can move approximately 2 mgd north and south between these communities will make it possible to provide water from LCWSA in the south or Avon in the north to the entirety of the west side. Two options for this transmission main would provide water between either the Town of York and the Village of Leicester, approximately 8.2 miles of 16" water main. The other option would include extending the transmission main past Leicester and to the Village of Mount Morris, a total of 14.5 miles.

The proposed estimate for an 8.2 mile long transmission main is $9,504,000.

The proposed estimate for a 14.5 mile long transmission main is $15,312,000.

Avon-York Connection

The Towns of Avon and York are separated geographically by the Genesee River. Across the County in the project area's water systems, there are currently two locations where water mains cross the Genesee River, on between the Village of Mount Morris and the Town of Leicester, the other between the Town of Geneseo and the Town of York. This Geneseo-York connection is currently the only feed providing water to the Town of York.

This alternative proposed to install new water main to provide a new feed of public water into the Town of York, from the Town of Avon. This would provide the opportunity to supply the Town of York either from the Village of Avon WTP, or LCWSA via a new Livonia transmission main, as well as building in redundancy by having more than one location crossing the Genesee River into the Town of York. Most of the distribution mains in this area of the Town of Avon are small diameter, between 2"-6" water mains. Therefore, some parallel mains may need to be installed in order to ensure sufficient capacity being provided to York and Leicester. The alternative would propose approximately 4 miles of 16" main, as well as a directional drill for the river crossing.

The proposed estimate for this alternative is $8,236,800.

South Conesus High Pressure Line

At the south end of Conesus Lake, water passes through 3 separate hydraulic zones as it travels from the Town of Conesus to the Town of Groveland. Water from the 1,390' zone in the Town of Conesus passes through a pressure reducing valve into the 1,040' zone. The Maple Beach pump station on the west side of the Lake then pumps water back up to 1,460' into the Town of Groveland. Due to the drastic changes in hydraulic grade, the Maple Beach pump station has low

suction pressures, around 8-12 psi. Pumping capacity can be limited by the suction pressure at this pump station and reduces the ability to expand and grow the volume of water being provided to the Town of Groveland, and in turn the ability to supply Mount Morris, Leicester and York from the south.

This alternative proposes to install a new high-pressure transmission main directly from the 1,390' zone to the Maple Beach pump station suction header. This new transmission main will provide opportunity to provide higher capacity to the Town of Groveland that can be pushed further into the Town and Village of Mount Morris and north into the Town and Village of Leicester, and even the Town of York. Construction of this line would involve approximately 3.5 miles of 20" water main, to convey approximately 3.0 mgd.

The proposed estimate for this alternative is $4,804,000.

Livonia – Conesus Transmission Main

Utilizing much of the existing infrastructure to increase capacity on the west side of the County will require conveying more water around the south end of Conesus Lake, and to the Maple Beach pump station. Currently, there are two mains that convey water south, a 12" main on East Lake Road, and a 10" line on NYS Route 15. This alternative would include adding an additional water main from the Village of Livonia through the Town of Conesus to convey additional capacity and provide redundancy in the water system along sections of NYS Route 15 and Clark Road.

Most of this area would also be serving new customers in the Town of Conesus and Town of Livonia that do not currently have access to public water. Both communities are in the process of building out their water systems and residents regularly inquire about public water. As with some other alternatives, some costs savings and efficiencies may be available through sharing costs between the LCWSA and the Towns, through upsizing of planned water projects. This project would require approximately 8.6 miles of 16" water main to provide additional transmission of about 2 mgd to the South end of Conesus Lake.

The proposed estimate for this alternative is $9,082,000.

Geneseo West Lake Road Utilization

In the Town of Groveland, the Maple Beach pump station currently only has a single feed from the south end of Conesus Lake, and due to pressure zones in the areas, operates with low suction pressures. Along the west side of the Lake in the Town of Geneseo, the infrastructure already exists to provide a second feed to the Maple Beach pump station, which would improve capacity and suction pressure at this location. However, due to billing and separation of water sources, valves are currently closed along this 12" water main on West Lake Road, and this area is only servicing residents of the Town of Geneseo. By establishing and agreement with Geneseo, LCWSA could utilize this water main to allow water to free flow from north of Geneseo, through

the Town, and to the Maple Beach pump station which would increase capacity to the Town of Groveland. This alternative would also provide redundancy in the area, with very little capital cost. Master meters may need to be installed in order to track billing into and out of the Town of Geneseo.

The proposed estimate for this alternative is $50,000.

Groveland – Mount Morris Route 36 Connection

Multiple locations in the Town of Mount Morris are served by the Village of Mount Morris, including a dead-end section of water Main along Route 36 that extends approximately 1.25 miles south of the Village. The LCWSA system also has a dead-end section of water main on NYS Route 36, where the DOCCS site is served, approximately 2 miles south of the Mount Morris water system. This alternative would propose to connect these two dead ends with 12" pipe, ultimately making it possible to provide about 1 mgd of water from the Town of Groveland (LCWSA system) to the Town and Village of Mount Morris.

The proposed estimate for this alternative is $2,772,000.

Maple Beach Pump Station Upgrades

The Maple Beach pump station was designed to provide water to residents of the Town of Groveland, as well as DOCCS. This pump station is located at the south end of Conesus Lake, a location that would have the potential to convey water from the south, through the Town of Groveland and into the Town of Mount Morris, Town of Leicester and Town of York. This alternative would propose to increase pumping capacity at this facility from approximately 1.5 mgd to 4 mgd, to provide water to the west side of the County. This alternative would need to be paired with additional piping upgrades throughout the County, to improve low suction pressures at the station before being able to pump flows up to 4 mgd.

The proposed estimate for this alternative is $750,000.

Groveland ARS Enhancements

Multiple projects are being designed and constructed in the Town of Groveland as the community builds out to its areas that do not have public water. The existing American Rock Salt (ARS) site recently transferred from the Village of Mount Morris source to the LCWSA source with new water mains being installed in the Town of Groveland. In addition, a new water district is being established in the Town of Groveland to provide water to interested residents on multiple roads throughout the Town.

Based on the existing infrastructure the ARS site can, hydraulically, receive water from both the Village of Mount Morris system or the LCWSA system. This infrastructure can be used to provide

the Village and Town of Mount Morris with water from LCWSA. As the Town of Groveland builds out their water system, LCWSA can share costs to connect some of the proposed dead ends in the system to convey more water to the Village of Mount Morris and expand the distribution system in the area, providing water to more residents of the Town of Groveland.

This project would include connecting dead ends on Logan Road with approximately 1 mile of 12" water main, and upsizing about 1.6 miles of planned water mains on Logan Road, Adamson Road and East Groveland Road from 8" to 12".

The proposed estimate for this alternative is $1,267,200.

Groveland-Leicester Connection

Should the Village of Mount Morris not participate in the regional water project, the Town and Village of Leicester will need to receive water from the south, bypassing the Village of Mount Morris. In order to do this, a new connection will need to be made between the Town of Groveland and the Town of Leicester. The closest point of connection from the LCWSA system is the ARS system in the Town of Groveland. A new 12" main will be constructed connection the ARS site through the Town of Geneseo and crossing the Genesee River on Jones Bridge Road, approximately 4.5 miles. Since the LCWSA system has a higher hydraulic grade, there will not be a need for any pump stations along this route.

The proposed estimate for this alternative is $4,564,000.

Village of Avon Papermill Connection

The design of the project will take into account the ability to interconnect the LCWSA water system and the Village of Avon water system. In order to do this, the new LCWSA transmission main will connect to the Village's existing water storage tank, that provides fire flow storage and pressure to the Village. This connection will include approximately 3 miles of 12" water main installed along Papermill Road and NYS Route 39. The hydraulic grade of the transmission will be higher than the existing tank, and therefore a new PRV will need to be installed in order to supply flow from the LCWSA system to the Village of Avon.

The proposed estimate for this alternative is $2,376,000.

Town of Avon Route 15

In order to provide the option to supply the Town of Avon with water from the City of Rochester source, an interconnection must be made between the new LCWSA transmission main and the existing Town of Avon water system. This connection will include approximately 4,300 linear feet of 12" water amin along NYS Route 15, providing water from LCWSA system to the Town's 955' hydraulic grade zone.

The proposed estimate for this alternative is $910,000.

New York Pump Station

The Town of York currently requires a pump station that increases the hydraulic grade of water after crossing underneath the Genesee River. The existing pump station that provides water from the Village of Geneseo is at the end of its useful life and is currently being considered for a capital project by the Town of York. As part of this project, based on the new transmission mains being planned in the Town of York to change the water supply, a new pump station could be constructed to replace the existing facility. The location and operation of the new pump station would be similar to the existing, and would supply similar flows, approximately 1.0 mgd, based on the current and future expected demands in the Town of York.

The proposed estimate for this alternative is $600,000.

New Leicester Tank

In the existing water system, both the Village and Town of Leicester each have an existing water storage tank. Each of the tanks are near the end of their useful life and will either need to be replaced or rehabbed in the next few years. The two tanks combine for approximately 450,000 gallons of storage to serve their community. As part of this projects, the two tanks could be taken out of service and replaced by a single tank. This new tank would also be able to serve new areas of the Town of Leicester and the Town of York as new water amin is installed and new residents are hooked up to the system. The alternative proposed to construct a new 1-million-gallon water storage tank along the new route of the River Road transmission main.

The proposed estimate for this alternative is $1,000,000.

New LCWSA Tank

As part of the 2020 LCWSA Capital Improvement Plan, a new water storage tank in the Village or Town of Livonia was planned to replace and expand the existing Shelly Road water storage tank. The LCWSA received EFC funding to pay for this new tank, along with their water system improvements throughout the County. This facility is the main water storage location for the LCWSA; based on the future needs of the County, and the potential expansion of service to surrounding communities, this alternative would fund additional capacity expansion of this water storage tank. The tank is currently planned for a volume of 2 million gallons but could be increased to a total of 3 million gallons of storage to account for the community and water system growth. This project would contribute to the expansion of the already planned project.

The proposed estimate for this alternative is $1,000,000.

4 Summary and Comparison of Alternatives

Each of the alternatives above have been presented as an a la carte list, with the ability to mix and match a number of different source options and transmission options to ultimately achieve the goal of providing reliable public water to the west side of the County. Factors must be considered including rectifying residents water sources affected by the Salt Mine collapse, future growth, intermunicipal relationships, and coordination with planned municipal water projects.

Selections of multiple alternatives are grouped into scenarios that each take into account a means of addressing each of these factors and providing unique solutions. The charts below summarize each of the alternatives mentioned in the Section 3 of this report. Five scenarios have been selected for comparison and that include a number of different alternatives. In addition, each scenario assessed multiple iterations of wholesale water rate formation based on potential interest rates ranging from 0%-2%, as well as the number of customers being added in each Town and Village connecting to the LCWSA system.

Source Alternative Estimates

Source Alternatives	Cost
Village of Avon WTP Expansion	$7,100,000
Village of Mount Morris WTP Expansion	$17,000,000
New LCWSA Pump Station (City of Rochester Source) – 4 mgd	$2,500,000
New LCWSA Pump Station (City of Rochester Source) – 5 mgd	$3,000,000
New LCWSA Pump Station (City of Rochester Source) – 6 mgd	$3,500,000
Hemlock Pump Station (LCWSA) Expansion	$2,000,000
MCWA Covington Connection	$350,000
MCWA Caledonia Connection	$750,000

Transmission Alternative Estimates

Transmission Alternatives	Cost
Livonia Transmission Main – 16 inch	$15,840,000
Livonia Transmission Main – 20 inch	$21,120,000
Livonia Transmission Main – 24 inch	$25,740,000
River Road Transmission Main – 8.2 miles	$9,504,000
River Road Transmission Main – 14.5 miles	$15,312,000
Avon-York Connection	$8,236,800
South Conesus High Pressure Line	$4,804,000
Livonia – Conesus Transmission Main	$9,082,000
Geneseo West Lake Road Utilization	$50,000
Groveland – Mount Morris Route 36 Connection	$2,772,000
Maple Beach Pump Station Upgrades	$750,000
Groveland ARS Enhancements	$1,267,200
Groveland – Leicester Connection	$4,564,000

Village of Avon Papermill Connection	$2,376,000
Town of Avon Route 15 Connection	$910,000
New York Pump Station	$600,000
New Leicester Tank	$1,000,000
New LCWSA Tank	$1,000,000

Scenario 1

This Scenario was outlined to provide potable water to the Towns of York and Leicester from the City of Rochester source. To provide the increased capacity to the system, a new 4 mgd pump station will be constructed along the City of Rochester pipelines, on the east side of Livingston County. This new pump station will have the ability to expand in the future to account for higher demands in the County. Water will be pumped to a new LCWSA tank via a new transmission main through the Towns of Livonia, Lima, Geneseo and Avon, and will cross the Genesee River into the Town of York. Water will be fed along the new River Road transmission main in the Town of York south to a new pump station provide the higher hydraulic zone water in York, and eventually into a new tank in the Leicester to provide water to the Village and Town.

Minimal work will be done on the south end of the County, but some upgrades will take place to provide the Village of Mount Morris with public water from LCWSA, to replace their WTP. The water main along West Lake Road would be opened and utilized as part of the LCWSA's operation, and upgrades will be performed at the Maple Beach pump station to increase the potential capacity. The Village of Mount Morris has a single connection to the LCWSA system at the American Rock Salt site, but a second connection will be made along NYS Route 36 to provide more capacity and redundancy. A map showing the proposed projects can be found in Appendix J.

The proposed Phase 1 cost for this Scenario is $51,100,000, and Phase 2 (when needed) would cost $2,000,000 for future pump station expansion. A complete cost estimate can be found in Appendix K. By completing much of the work in Phase 1, the LCWSA will not only meet the current needs of the impacted communities but will also set up for future growth in the community through 2050 by creating pumping and transmission capacity. By completing this project, residents in multiple towns will be able to avoid capital costs that would be required without a regional project, including constructing a new tank in Avon, completing the required WTP improvements in Mount Morris, and constructing two new tanks in the Village and Town of Leicester.

This scenario would add an additional 320 customers for the LCWSA to offset some of the costs of the projects. Projected wholesale water rates for this scenario range from $2.76-$3.17, all below the existing wholesale rates for the Towns of Leicester, York, Geneseo and Mt. Morris and the Village of Leicester. A further analysis of the projected water rates can be found in Appendix L.

Scenario 1A

This Scenario was outlined to provide potable water to the Towns of York and Leicester from the City of Rochester source, much like Scenario 1. After discussions with municipalities in the County, the scenario was created in order to provide potable water to the Town and Village of Avon, using the same infrastructure as Scenario 1 and making two connections in the Town of Avon.

The proposed Phase 1 cost for this Scenario is $55,300,000, and Phase 2 (when needed) would cost $2,000,000 for future pump station expansion. A complete cost estimate can be found in Appendix K. By completing much of the work in Phase 1, the LCWSA will not only meet the current needs of the impacted communities but will also set up for future growth in the community through 2050 by creating pumping and transmission capacity. Upon completing this project, residents in multiple towns will be able to avoid capital costs that would be required without a regional project, including constructing a new tank in Avon, completing the required WTP improvements in Mount Morris, and constructing two new tanks in the Village and Town of Leicester.

This scenario would add an additional 320 customers for the LCWSA to offset some of the costs of the projects. Projected wholesale water rates for this scenario range from $2.71-$3.10, all below the existing wholesale rates for the Towns of Leicester, York, Geneseo and Mt. Morris and the Village of Leicester. A further analysis of the projected water rates can be found in Appendix L.

Scenario 2

This Scenario, like Scenario 1, accounts for most of the future growth in the County in Phase 1, and similarly increases the LCWSA supply source via the City of Rochester feed and transmission through a new 4 mgd pump station and main through Livonia, Lima, Geneseo and Avon. However, rather than supply Leicester through the Town of York, a connection will be made to the Town of Groveland on the south side of the LCWSA system. The Village of Mount Morris WTP will stay active to provide water to the residents of the Village of Mount Morris. The Town of Mount Morris will be able to receive potable water from a new connection from LCWSA on NYS Route 36. A map showing the proposed projects can be found in Appendix J.

The proposed Phase 1 cost for this Scenario is $50,200,000 and Phase 2 (when needed) would cost $2,000,000 for future pump station expansion. A complete cost estimate can be found in Appendix K. By completing much of the work in Phase 1, the LCWSA will not only meet the current needs of the impacted communities but will also set up for future growth in the community. The difference between Scenario 1 and Scenario 2 is the omission of the Village of Mount Morris as new customers for the LCWSA. By completing this project, residents in multiple towns will be able to avoid capital costs that would be required without a regional project, including constructing a new tank in Avon and constructing two new tanks in the Village and Town of Leicester.

This scenario would add an additional 320 customers for the LCWSA to offset some of the costs of the projects. Projected wholesale water rates for this scenario range from $2.98-$3.46. If water rates reach the high end of the projection, they would still be below or the same as the existing wholesale water rate of the Towns of Leicester, York, Geneseo and Mt. Morris and the Village of Leicester. A further analysis of the projected water rates can be found in Appendix L.

Scenario 3

This scenario outlines projects in order to meet the immediate needs of the County in Phase 1, and delays costs for future expansion to Phase 2. In order to provide the required current capacity to the Town of York, the Village of Avon WTP would be expanded from 1.0 mgd to 2.0 mgd total capacity. Water would be conveyed from the Village of Avon to the Town of York through a new transmission main connecting the two Town systems. A new transmission main would convey water to a new pump station in the Town of York to provide water to the higher hydraulic grade.

The Town and Village of Leicester, as well as the Town and Village of Mount Morris will be connected to the LCWSA via the Town of Groveland. Upgrades to the existing Maple Beach pump station, expanding the ARS connection and a new connection on NYS Route 36 will provide the necessary capacity to these communities.

These connections and upgrades provide the Town of York, and the Town and Village of Leicester with necessary projects to supply them, but do not account for any continued growth or expansion in the County system. Also, this Scenario does not provide water to the southern part of River Road, an impacted area from the salt mine collapse. Therefore, as water requirements expand in the future, additional projects will need to be completed to provide more water as part of a Phase 2 between 2030 and 2040, approximately 10 years from now based on the demand charts in Sections 1.5 and 2.2. This would include the addition of a new 4 mgd pump station connected to the City of Rochester pipeline as well as a new tank and a transmission main through the Towns of Livonia, Lima, Geneseo and Avon. To account for growth in the Towns of Leicester and York, the River Road transmission main will be lengthened, and the flow direction of Leicester will change, with water coming from the Town of York from the north rather than the Village of Mount Morris from the south. A new tank will be constructed in the Town of Leicester as well to replace their existing tanks. A map showing the proposed projects can be found in Appendix J.

The proposed Phase 1 cost for this Scenario is $33,200,000 and the Phase 2 costs are $43,100,000 for future system expansion. A complete cost estimate can be found in Appendix K. This alternative keeps the costs of the initial work lower by expanding only what is necessary based on current demands but creates higher overall project costs when the capacity expansion is required. This scenario would add an additional 45 customers for the LCWSA in Phase 1, which would not help much to offset some of the costs of the projects. By completing this project, residents in multiple towns will be able to avoid capital costs that would be required without a regional project, including completing the required WTP improvements in Mount Morris and constructing two new tanks in the Village and Town of Leicester.

Upon the completion of Phase 2, an additional 285 customers could be added to offset some of the costs. Projected wholesale water rates following Phase 1 for this scenario range from $1.81-$1.89, each below the existing wholesale rates for the Leicester and York. A further analysis of the projected water rates can be found in Appendix L.

Scenario 4

Scenario 4 is similar to Scenario 3, in that is seeks to provide water for the existing needs of the Town of York and Towns and Village of Leicester in Phase 1, and account for future expansion and growth in the County via Phase 2. As part of Phase 1, this Scenario assumes the Village of Mount Morris WTP remains operational, therefore making it necessary to supply the Town and Village of Leicester from the Town of Groveland, through a new water main connection. The Town of Mount Morris will be able to receive potable water from either the Village of Mount Morris or through a new connection from LCWSA on NYS Route 36.

Also, this Scenario does not provide water to the southern part of River Road an impacted area from the salt mine collapse. Phase 2 for Scenario 4 is identical to Phase 2 of Scenario 3, altering the direction of flow for Leicester from the Town of Groveland to the south to the Town of York to the north. Phase 2 for Scenario 4 is identical to Phase 2 of Scenario 3, altering the direction of flow for Leicester from the Town of Groveland to the south to the Town of York to the north. As water requirements expand in the future, additional projects will need to be completed to provide more water as part of a Phase 2 between 2030 and 2040, approximately 10 years from now based on the demand charts in Sections 1.5 and 2.2. A map showing the proposed projects can be found in Appendix J.

The proposed Phase 1 cost for this Scenario is $37,500,000 and the Phase 2 costs are $43,100,000 for future system expansion. A complete cost estimate can be found in Appendix K. This alternative also keeps the costs of the initial work lower by expanding only what is necessary based on current demands but creates higher overall project costs when the capacity expansion is required. This scenario would add an additional 45 customers for the LCWSA in Phase 1, which would not help much to offset some of the costs of the projects. By completing this project, residents in multiple towns will be able to avoid capital costs that would be required without a regional project, including constructing two new tanks in the Village and Town of Leicester.

Upon the completion of Phase 2, an additional 285 customers could be added to offset some of the costs. Projected wholesale water rates following Phase 1 for this scenario range from $2.19-$2.41, all below the existing wholesale rates for the Leicester and York. A further analysis of the projected water rates can be found in Appendix L.

Scenario 5

Scenario 5 also proposes to expand the supply capacity of the LCWSA via a new pump station at the City of Rochester pipeline but has a different flow path of water than Scenario 1. Rather than pushing most of the water through the north end of the County system, water will be conveyed south through the Town Groveland and eventually back north to the Towns of Leicester and York. In order to this, a new transmission main will be constructed on the east side of the County to expand capacity, along with the new 4 mgd pump station connected to the City of Rochester pipeline.

To get more water to flow south, a new water main will be installed from the Village of Livonia, south to the Maple Beach pump station, with some areas of parallel mains. Expansion of the Maple Beach pump station and additional connections between Groveland and Mount Morris will provide the required future capacity of water to the western communities. Along River Road, a transmission main will be installed to push water from the south to the Town of York to the North, where a new pump station will be constructed to provide water to the higher hydraulic grade. A map showing the proposed projects can be found in Appendix J.

The infrastructure installed in Phase 1 will have capacity to convey enough water for future growth from the City of Rochester source. The Phase 2 of this scenario would include the expansion of the new pump station. The proposed Phase 1 cost for this Scenario is $68,400,000, and the Phase 2 costs is $2,000,000 for future pump station expansion. A complete cost estimate can be found in Appendix K.

By completing much of the work in Phase 1, the LCWSA will not only meet the current needs of the County but will also set up for future growth in the community. This scenario would add an additional 385 customers for the LCWSA to offset some of the costs of the projects. By completing this project, residents in multiple towns will be able to avoid capital costs that would be required without a regional project, including constructing a new tank in Avon, completing the required WTP improvements in Mount Morris, and constructing two new tanks in the Village and Town of Leicester.

Projected wholesale water rates for this scenario range from $3.43-$4.07. Water rates for this scenario would be higher for than the existing rate for the Towns of York and Geneseo. If the wholesale rate reaches the high projection, water rates would also be higher for the Town of Mount Morris and Village of Leicester. A further analysis of the projected water rates can be found in Appendix L.

Scenario Comparison

	Scenario 1	Scenario 1A	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Redundancy/ Interconnections	-LCWSA system looped -2 points of connection to LCWSA source	-LCWSA system looped -2 points of connection to LCWSA source	-2 points of connection to LCWSA source			-2 points of connection to LCWSA source
Source Consolidation	Eliminate Mount Morris WTP	Eliminate Mount Morris WTP		Eliminate Mount Morris WTP		Eliminate Mount Morris WTP
Phase 1 Capacity Change	+5 mgd	+5 mgd	+5 mgd	+1 mgd	+1 mgd	+5 mgd
Salt Mine Impacts	Complete River Road Corridor	Complete River Road Corridor	Complete River Road Corridor	Partial River Road Corridor	Partial River Road Corridor	Complete River Road Corridor
Operational Complexity	Low	Low	Low	Low	Low	High
Phase 1 Customer Gain	320	320	320	45	45	385
Cost Avoidance*	$18,000,000	$24,400,000	$7,400,000	$18,000,000	$1,000,000	$18,000,000
Phase 1 Capital Costs	$51,100,000	$55,300,000	$50,200,00	$33,200,000	$37,500,000	$68,400,000
Projected New Local Project Cost	$13,660,000	$16,180,000	$13,120,000	$2,920,000	$5,500,000	$24,040,000
Projected Wholesale Rate per 1,000 gallons**	$3.17	$3.10	$3.46	$1.89	$2.41	$4.07
(T)York Annual Impact per EDU	-$22.50	-$26.68	-$4.99	-$99.11	-$68.08	$31.55
(T) Leicester Annual Impact per EDU	-$140.10	-$144.28	-$122.59	-$216.71	-$185.68	-$86.05
(V) Leicester Annual Impact per EDU	-$51.30	-$55.48	-$33.79	-$127.91	-$96.88	$2.75
(T) Mount Morris Annual Impact per EDU	-$65.10	-$69.28	-$47.59	-$141.71	-$110.68	-$11.05
(T) Geneseo Annual Impact per EDU	-$22.50	-$26.68	-$4.99	-$99.11	-$68.08	$31.55
Projected Phase 2 Costs	$2,000,000	$2,000,000	$2,000,000	$43,100,000	$43,100,000	$2,000,000

*Costs Avoidance based on the ability of individual municipalities participating in a regional project in order to avoid required individual capital projects. Projects include building a new tank for the Town of Avon, upgrades to the Village of Mount Morris WTP, and constructing two new tanks in the Town and Village of Leicester.

**based on 30 year EFC loan at 2% interest rate, with LCWSA making a connection to Town of York, Town and Village of Leicester, Town of Mount Morris and Town of Geneseo. See Appendix L for multiple options of water rates based on the proposed Scenarios. High and low projections take into consideration maximum and minimum number of Towns and Villages making connection to LCWSA water system.

5 Recommended and Selected Alternatives

Based on the considerations outlined below, **the recommended combination of alternatives is Scenario 1A, for a total Phase 1 capital cost of $55,300,000**.

Capital Cost –This Scenario manages to provide enough capacity for growth and expansion of the LCWSA water system. As part of the proposed projects involved, there will be less required in the future to provide more capacity and less need to make significant capital costs in the future.

Rate Stabilization – Multiple communities will have the opportunity to connect to the LCWSA water system, providing them with the most stable rates of any water provider in the County. Over the past 10 years, LCWSA rates have increased less than 5%.

Water Rates – Water Rates per 1,000 gallons for the project are projected to be between $2.67 and $3.04, depending on potential interest rates and the number of wholesale customers connecting to the LCWSA system. Whether at the high end or low end of the range, each community connecting to the LCWSA system will see savings in their annual water cost. A further examination of the water rates can be found in Appendix L.

Customer Gain – Based on the proposed project, the LCWSA system would gain an additional 320 customers that will help to offset some of the capital costs. This alternative also provides the ability of other Towns and Villages to connect to LCWSA in the future to create a larger customer base. Note, many of these customers have water quality issues due to their private wells in agricultural areas. In addition, during the summer months many homeowners rely on hauling water for use, as their wells run dry.

Redundancy and Interconnections – This scenario creates a large looped system for LCWSA and the participating municipalities, with water flowing around the County to the South, as well as through transmission main in the North, meaning that many of the participating communities can have emergency backup supplies, and alleviating some of the existing and potential water quality concerns in the County. There would be two separate connection point with the City of Rochester WTP. It also consolidates water systems and provides a new source of water for the Village of Mount Morris in lieu of their own treatment plant and avoiding significant capital cost of improvements at that facility. In addition, this scenario provides the ability for many other Towns and Villages that are currently served from other sources including Lima and Geneseo to connect to the LCWSA water system in the future.

Lastly, this scenario provides for additional redundant connections with the Villages of Avon and Geneseo WTP's. The LCWSA will also pursue emergency supply agreements with the Village of Avon and Village of Geneseo to provide further redundancy in each water supplier's system.

Capacity – By making an additional connection to the City of Rochester conduit this scenario gives the ability to provide water for existing deficits and future growth and development throughout the County. Towns and Villages like Avon, Geneseo and Lima that are not served by the LCWSA can connect for minimal capital costs. Capacity is also available for multiple economic development parks throughout the County.

Salt Mine Impact Area – This scenario provides public water to the remaining areas with private wells impacted by the collapse of the Salt Mine along River Road in the Towns of York and Leicester.

Local Project Upsizing – Based on the location of already planned Town and Village projects, this scenario provides for some cost sharing on some of the alternatives, including water storage projects in Leicester, Avon and Livonia, transmission main projects in the Town of Lima and pump station projects in the Towns of York and Lima.

Operational Complexity – This scenario is relatively simple operationally, with the additional pump station for LCWSA supply, and a new storage tank and transmission main moving water across the County, limiting the new equipment and hydraulic operations required by the staff at LCWSA. The project will also include upgrades at major system components, including the Maple Beach pump station and the York pump station to provide more reliable water to LCWSA customers. SCADA and controls at these facilities will be upgraded as well.

Environmental Impacts – The proposed project will provide water supplied from a surface water source to residents currently on wells tied into the impacted salt mine area, providing a safer and more reliable water supply. In addition, because of the allowable water allocation from the City of Rochester source, the potential capacity needs of the County can be met throughout the future. During construction, some mitigation will need to be performed to cross the Genesee River with transmission mains, as well as potential of construction through existing Agricultural districts. A full environmental review will be conducted in accordance with the SEQRA to determine the potential impacts on wetlands, floodplains, as well as historically and environmentally sensitive areas during design and layout of the project.

Miscellaneous – The proposed project will also have the following benefits:

- Replacement of the water storage tanks in the Town and Village of Leicester, with a single tank. The existing tanks have reached the end of their useful life and have deficiencies noted by the Livingston County Department of Health (Appendix F).
- The project will address inadequate pressures, below State standards, in portions of the existing system in the Village of Livonia.
- Eliminate the aesthetic water quality issues noted by the consumers that utilize the Village of Mt. Morris for supply, particularly during the warm summer months.
- Reduce the levels of TTHM's in the Town of Leicester and Town of York, as they will change supply. Both municipalities struggle with maintaining limits, with the Town of Leicester recently in a Consent Order with the EPA for violations (Appendix G).

- The project is consistent with the findings outlined in the adopted 2020 Livingston County Comprehensive Water Supply Study.
- Addressed inadequate source capacity, as indicated earlier in the report the majority of the WTP's that supply water to the areas exceed the maximum rated capacity during periods of the year.
- By eliminating the Mt. Morris WTP, the project will address NYSDOH deficiencies identified related to the filtration and concerns related to the chlorine contact times (Appendix I).

Project Schedule – Based on the proposed projects included in Scenario 1, the planned construction schedule is as follows:

Potential Funding Award	January 2023
Design	April-December 2023
Bidding	January-March 2024
Award & Submittal Review	April-July 2024
Construction	August 2024-December 2026

6 Potential Funding Sources

NYSEFC Drinking Water State Revolving Loan Fund

The United States Environmental Protection Agency (EPA) allocates funds to New York State through the Environmental Facilities Corporation (NYSEFC) for the Drinking Water State Revolving Fund (DWSRF). The DWSRF allocates funds to all communities, giving no priority to any project based on the size of the community. The program provides financing for needed drinking water infrastructure improvements including work on water treatment plants, distribution systems, and tanks.

For a project to be eligible for funding under the DWSRF, the project must include construction or upgrading a water treatment plant or some part of the distribution network including water main and storage tanks. Funds are not provided for the maintenance or operation of facilities.

The DWSRF provides several different types of assistance including zero interest short term loans and low interest long term loans. Grants (in the form of principal forgiveness) and subsidized loans may be available for communities that can demonstrate financial hardship based on median household income (MHI).

The subsidized loans can have interest rates as low as 0% and are typically financed over a 30-year period. In order to be eligible for the loan, the project must serve residential populations.

The LCWSA should ensure that any project it undertakes meets the requirements of DWSRF. For example, the Town should ensure that the requirements for the Davis-Bacon Wage Rates and the Minority and Women in Business Enterprise/Equal Employment Opportunity (MWBE/EEO) requirements are met, even if financing for the project seems unlikely, in the event that funding becomes available in the immediate future.

NYSEFC Water Infrastructure Improvement Act (WIIA) & Intermunicipal Water Infrastructure Grants (IMG) Program

The New York State Clean Water Infrastructure Act (CWIA) of 2017 invests $3 billion in clean and drinking water infrastructure projects and water quality protection across the state. As part of CWIA, the New York State Environmental Facilities Corporation (EFC) is offering $225 million in grants for clean and drinking water projects during the 2022-2023 state fiscal year to selected municipalities with infrastructure projects that protect public health and/or improve water quality.

WIIA Drinking Water Projects

An applicant with an eligible drinking water project may receive a WIIA grant award as described below:

- A project addressing an emerging contaminant above the State determined Maximum Contaminant Level (MCL) would be awarded 60% of net eligible project costs.
- A project that does not address emerging contaminants, including phases of the project, would be awarded the lesser of $5 million or 60% of net eligible project costs.

Municipalities may apply for this grant on more than one project, but each municipality is limited to receiving no more than $5 million per year. Municipalities are limited to $5 million of combined Drinking Water State Revolving Fund (DWSRF) grant, including BIL General Supplemental and Emerging Contaminants (but excluding Lead Service Line Replacement), and WIIA grants annually.

IMG Clean Water and Drinking Water Projects

Cooperating municipalities with an eligible project may receive an IMG grant award as described below:

- The lesser of $30 million or 40% of net eligible project costs.

Municipalities may apply for this grant on more than one project, but each municipality is limited to receiving no more than a $10 million allocation per year. If a municipality is awarded grant funds totaling more than $10 million for a project or projects, the grant(s) will be allocated over multiple years in increments not to exceed $10 million per year.

All municipalities within New York State are eligible for a WIIA and IMG grant. The evaluation of projects to allocate funding will consider factors such as the water quality improvement, reduction in risk to public health, financial needs of the community, readiness to advance construction, and the level of demonstrated community support.

United States Department of Agriculture (USDA)

The USDA provides loans and grants to communities with no more than 10,000 people or to rural communities with no population limits. For the community to be eligible for these loans and/or grants it must:

- Be unable to commercially obtain a loan at reasonable rate/terms,
- Have the ability to repay the loan, and
- Maintain and operate the facilities; and the new facilities must be in compliance with all laws and standards.

The programs are administered on a national level by the Rural Utilities Service, a branch of the USDA, through state offices that distribute the funds to districts and municipalities. Funding is formulated based on rural population, poverty, and unemployment.

The program is implemented in order to provide rural communities with basic human amenities and to promote growth of these rural areas. The program allocates funds for installation, repair, maintenance, or expansion of current facilities.

Loan stipulations include the repayment of the loan within 40 years or by the end of the design life (the lesser of the two). Loans come directly from the USDA or are from commercial third-party lenders, in which case 90% is guaranteed by the USDA.

The USDA may award grants if the project is within a low to medium MHI range. Eligible projects must take place in a community where the population is not projected to decline below the designed project population. The grants are used to reduce costs to a reasonable level for the municipality and they can be used in conjunction with loans if the community is able to repay only part of the project cost.

The USDA also provides grants to fund nonprofit organizations that provide technical support and training to rural communities with regard to water and waste disposal. There are several organizations operating throughout the country with offices in each state.

Community Development Block Grant

The Office of Community Renewal, an office within the New York State Homes & Community Renewal (NYSHCR), administers the Community Development Block Grant (CDBG) program previously operated as the "Small Cities" program. The CDBG is a program designed to provide direct assistance to small, rural communities with low to moderate income in New York State. The funding, in the form of grants, is typically allocated to small communities with aging public infrastructure that requires updating or expansion.

In order to be eligible, the community must demonstrate a need for upgrade or replacement to existing drinking water infrastructure or the requirement for construction of new potable water systems. Communities must also have a population below 50,000 people and demonstrate low to moderate income levels.

Through the CDBG program, municipalities are eligible to receive grants for up to $750,000 for water infrastructure projects that include upgrades and improvements to sources storage or distribution. For public infrastructure projects, 18% of the grant may be used towards delivery, administration and engineering costs. One application per year is accepted per project annually, but a municipality could conceivably be awarded multiple grants over multiple years for the same project by applying for different parts or phases of a project over those years.

7 Conclusions and Recommendations

The LCWSA is committed to improving and maintaining a potable water distribution system that will continue to meet the current and future needs of the communities it serves. Completion of the proposed project will aid in providing safe drinking water to the current users of the water distribution system in the immediate future. The project will also work toward consolidating water systems in Livingston County to provide reliable potable water to the communities in the area.

As described in the Recommended Critical Actions of the Water Supply Study found in Appendix N, improvements to facilities across the county will have significant long-term cost and supply impacts for local users, that could result in higher water rates. The ability to create a regional project will help bore those costs and avoid some significant impacts on water users. Due to the size of the potential project and the number of communities involved, it would be beneficial to seek funding to proceed with the proposed project.