REVISED
PRELIMINARY ENGINEERING REPORT

FOR

EAST LAUREL WATER DISTRICT

OLD SALEM RD. / MCWHORTER RD. SYSTEM IMPROVEMENTS

PREPARED BY

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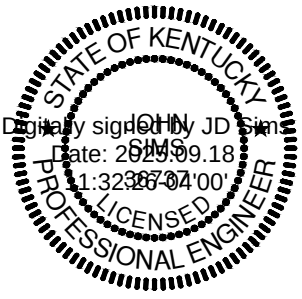
PROJECT NO. 2020052



JANUARY 2024

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1.0 INTRODUCTION

East Laurel Water District (ELWD), founded in 1965, is a water utility system whose purpose is to establish, develop, and operate a water supply and distribution system for its members and customers in eastern Laurel County and a small portion of western Clay County, Kentucky and northern Knox County, Kentucky. ELWD sells treated water to Manchester Water Works. ELWD purchases water from Wood Creek Water District (WCWD). Three utilities, ELWD, WCWD, and West Laurel Water Association (WLWA), are located at an office at 1670 Hal Rogers Parkway, London, KY 40741. The ELWD and WLWA have no employees, and the three utilities are operated and maintained by WCWD.

East Laurel Water District is a regional provider of treated water in Laurel County. ELWD purchases water from WCWD who built their treatment plant in 1967 and have expanded since, including a major expansion in 2008 that increased its capacity to 12.0 Million Gallons per Day (MGD). ELWD, along with WLWA and WCWD, serves a majority of rural Laurel County along with small portions of Clay, Knox, and Jackson Counties. Many of the existing lines and pump stations in this project are outdated, undersized for the demand needed, and have reached the end of their usable lives. Collectively, ELWD is aiming to construct 1,000 linear feet (LF) of 16" D.I. waterline, 29,000 LF of 6" PVC waterline, a pump station upgrade, new pump station, 2 master meter stations, a 139,000-gallon ground storage tank and 70 customers reconnects. Also, branch tie-ins will be converted to the 16” waterline on E KY 80 to abandon the existing 6” waterline. If funds remain at the completion of the project, a 3" PVC waterline will be installed up Hodge Road (Alternate #1) and/or replacing approximately 1,100 LF of 12" D.I. waterline with 16" D.I. waterline near North Laurel High School (Alternate #2). This project will be an essential step in supporting the growth of the ELWD system.

2.0 PROJECT PLANNING

2.1 Location

Founded in 1825, Laurel County was created from parts of Rockcastle, Clay, Knox, and Whitley Counties in the Commonwealth. It is situated in the southeastern region of Kentucky and sits at the heart of the Daniel Boone National Forest. London serves as the County Seat for Laurel County, and is near the geographic center of the County.

As stated previously, East Laurel Water District is a rural water utility system. The purpose of the ELWD is to establish, develop, and operate a water supply and distribution system for its customers in eastern Laurel County, northern Knox County, and western Clay County. Since the inception of the ELWD, there has been a steady rise in demand for clean, potable drinking water. This project will help East Laurel Water District support this increase in demand. A location map of the system with proposed project sites and additive alternates is shown in Figure 1 of the Appendix.

2.2 Environmental Resources Present

The proposed project is located across the eastern portion of Laurel County. According to the *Soil Survey of Laurel and Rockcastle Counties, Kentucky*, prepared by the USDA Soil Conservation Service, the major natural resources in the area are coal, timber and saltpeter, however, most of the saltpeter mines were located in adjoining Rockcastle County. Large amounts of saltpeter were mined during the War of 1812, and now the saltpeter industry is dormant. The mining and timber industry have also taken a sharp decline in recent years. Laurel County has an approximate land area of 446 square miles. Of that, 220 square miles is forest land, with the Forest Service owning and managing 80 square miles, and approximately 184 square miles is designated as farmland. The most important and prominent environmental resource in the area is the soil. Soil supports farming, which is the largest industry in the area. The farms are primarily family owned, and the primary crop is tobacco. About half the farm income comes from the sale of crops while the other half comes from livestock and livestock products. However, the area is growing and adding additional jobs and industries and will need the support of this project in order to deliver a sufficient water supply to these new homes and new industries. A more detailed Environmental Report will be completed at a later date. The Environmental Report focuses closely on many more aspects of the environment, and how each respective resource will be affected by the project.

2.3 Population Trends

The population of Laurel County according to the 2010 Census conducted by the United States Census Bureau was 58,849. East Laurel Water District currently services 5,549 customers or approximately 12,966 people. This is roughly 22 percent of the Laurel County population. Laurel County has seen a growth in population since 1980, at a rate of 1.15 percent per year. A population and water usage projection graph is attached as Figure 2 in the Appendix. Assuming the same trend will continue, the current water lines will not be able to efficiently withstand the growth without another feed into the system. This project will allow Laurel County to grow at its current rate and provide users a sufficient potable water supply.

3.0 EXISTING FACILITIES

3.1 Location Map

A location map for the East Laurel Water District distribution system is attached in the Appendix as Figure 1.

3.2 History

As stated previously, East Laurel Water District was founded in 1965 and has been a regional provider of treated water since its establishment. East Laurel Water District sells water and operates in accordance with West Laurel Water Association and Wood Creek Water District. These three utilities along with the London Utility Commission and Laurel County Water District #2 make up the majority of treated water distribution in Laurel County. The existing lines in this project have been in place for nearly 30 years and the demand has outgrown what the existing waterlines can efficiently deliver. This project will

upgrade these lines and one booster pump station, as well as adding an additional pump station and 139,000-gallon water storage tank to help ELWD run a more efficient, cost effective system.

3.3 Condition of Existing Facilities

The following description is an overview of the current system components and operating conditions:

3.3.1 Water Supply and Treatment: East Laurel Water District is a regional provider of treated water in Laurel County. It purchases all water from Wood Creek Water District, who maintains its own Water Treatment Plant. The source of the raw water is Wood Creek Lake. Using data gathered from East Laurel Water District's 2020 Audit Report, ELWD purchased approximately 467.8 million gallons from Wood Creek Water District in the year 2020.

3.3.2 Storage: East Laurel Water District currently has three (3) water storage tanks that serve as finished water storage facilities. All finished water supplied by the Wood Creek WTP is pumped to each of the water storage tanks in the system. The construction dates for these tanks range from 1989-2000 and are inspected regularly to ensure that they are up to code. The volumes of the three tanks across the system vary from 200,000 to 1,000,000 gallons totaling at 1.45 Million Gallons (MG) with overflow elevations that range from 1,420' to 1,426' above mean sea level.

3.3.3 Pumping Stations: East Laurel Water District system has four (4) pumping stations located in their distribution system. These pumps are located throughout the system and range in performance from 65 gallons per minute (GPM) to 1,200 GPM. These pumps maintain the water level in the water storage tanks, which sets the hydraulic grade line that drives the water throughout the extents of the system. While the East Pittsburg pump station has performed well over the years, it has begun to show its age and cannot efficiently meet the increased demands in the system. Based on monthly operating reports from ELWD, the distributed water that has passed through this pump station is as follows:

East Pittsburg Pump Station:

Annual Volume: 486,704,700 Gallons
Daily Average Volume: 1,333,400 Gallons per Day (GPD)
Daily Average during Maximum Month: 1,497,300 GPD
Maximum Day: 2,000,100 Gallons

The pumps at the East Pittsburg Pump Station generally run at a rate of 1,200 GPM. At this pumping rate, the approximate pump run time during 2020 was:

East Pittsburg Pump Station:

Annual Average Day: 18.3 hours (76% of capacity)
Maximum Month Average Day: 21.3 hours (89% of capacity)
Maximum Day: 23.78 hours (99% of capacity)

3.3.4 Distribution System: The East Laurel Water District distribution system carries a large volume of water through an aging and undersized network of lines that were constructed nearly 30 years ago. Since then, only a select few of the distribution system lines and components have been replaced. Several waterlines have been extended to the outskirts of eastern Laurel County, which puts more stress on these existing lines due to the increased demand throughout the system. Without the implementation of this project, these lines will continue to age, deteriorate, and hinder ELWD with additional maintenance costs. The aging, inefficient lines will lead to reduced hydraulic transmission capacity, lower system pressures, and overall poor system performance. The current distribution system network totals over 290 miles of water distribution lines with nearly 70% being diameters 4" and less. This project will replace approximately 5.5 miles of these existing, undersized 4" lines so that ELWD may grow and provide existing customers with safe, clean drinking water in the quantities they desire.

3.4 Financial Status of Existing Facilities

The financial status of East Laurel Water District is summarized in budget sheet attached in Figure 3 in the Appendix. The sheet shows the income generated, current operation and maintenance costs, and the existing debts of ELWD.

A Summary Addendum to Preliminary Engineering Report will be completed at a later date. The Summary Addendum will outline the projects feasibility, and determine the final rate increase needed based on more in-depth analysis of the ELWD's most recent financial statements.

4.0 NEED FOR PROJECT

4.1 Health, Sanitation, and Security

Many of the existing lines were constructed nearly 30 years ago and are badly undersized for the demand needed across the system at the present time. These inefficient lines can lead to breaks and leaks that can affect the customers' health throughout the ELWD service area. The replacement of these aging, undersized lines will ensure that ELWD will remain in compliance with federal regulations, and that end users are provided with clean, safe drinking water. After project construction, there are no other known health, sanitation, or security issues faced by ELWD.

4.2 Aging Infrastructure

The existing East Pittsburg booster pump station has been in place for 20 years. While the pump station has performed well over the years, the existing pumps are in need of an upgrade due to the increased demand in this area of the system in recent years. As with the pump station, the lines that will be replaced along Old Salem Road, McWhorter Road, and Maplesville School Road have given East Laurel Water District many problems with leaks and breaks due to age and increased demand. This project will replace the pump station and undersized, aging waterlines to give ELWD a more efficient and reliable system that can easily sustain future growth throughout eastern Laurel County.

4.3 Reasonable Growth

A detailed computer based hydraulic model has been developed for the East Laurel Water District, and has been updated over several years to reflect current system conditions. The replacement of waterlines and the existing pump station, as well as adding a new pump station and 139,000-gallon water storage tank, would allow for the area of eastern Laurel County to accommodate future growth.

In order to predict potential usage in the future, past population growth rates were analyzed, and this data was expanded using linear regression to develop an estimated future demand based upon the population growth. The future forecast period and hydraulic design basis will be a 20 year period, (although the design life of PVC pipe is much greater) providing an approximation to the year 2042. The population growth pattern was graphed, and is shown in Figure 2 in the Appendix. According to the graph, the population of Laurel County will be approximately 77,965 people by the year 2042. East Laurel Water District has a current customer base of 5,549 with a usage of 1.33 MGD. Assuming the same population growth pattern of 1.15 percent per year applies, an estimated customer base of 6,888 would require 1.65 MGD by the year 2042. This is an increase of approximately 24 percent over the current demand. With the construction of the proposed project, ELWD will be able to more efficiently support this increase in demand.

5.0 ALTERNATIVES CONSIDERED

5.1 Description

After consulting with East Laurel Water District, and discussing multiple alternatives, there were three alternatives that were ultimately to be considered. There are two technically feasible alternatives and one technically infeasible alternative to be considered. The alternatives considered to be technically feasible are the proposed plan outlined in this report, or construct the project in phases based on the highest priority waterlines being replaced first. This second alternative would involve procuring the funding to replace one section of waterline and pump station, as well as adding a new pump station and water storage tank now, and waiting to replace the additional lines along Hal Rogers Parkway and McWhorter Road, and tie-ins along KY 80 at a later date. The final alternative that could be chosen is not technical in nature, but is an option that ELWD is facing. This alternative is to simply not do the project, and continue the current practice of repairing leaks when they occur, otherwise known as reactive maintenance. This has been a substantial cost for ELWD due in part to both the intense labor needed to repair lines, as well as in the physical water losses. This option also does not allow for the community to grow and maximize its potential. Since the last option is technically infeasible, only the first options of replacement will be analyzed. Following the evaluation, one of the alternatives will be recommended to ELWD.

5.2 Design Criteria

Both technically feasible designs must be able to supply the current customer load of 5,549 with the ability to withstand the growth determined in Section 3.3 of this report. The current average daily demand for water is 1.33 MGD, with 1.33 MGD passing through

East Pittsburg pump station. With the population growing at a rate of 1.15 percent per year, the average daily demand is estimated to grow to 1.65 MGD, with 1.65 MGD passing through East Pittsburg pump station. The design criteria will be that the pump station will need to be able to handle at least 2.0 MGD, preferably 2.5 MGD. The waterlines will be designed to at least the standards of the current edition of Recommended Standards for Water Works (10 State Standards). No matter which alternative is chosen, the project will need to fulfill the needs of the East Laurel Water District by providing clean drinking water in the quantity required to sustain growth, all while remaining within the District's budget.

5.3 Map

Figure 4 in the Appendix shows the proposed waterline and pump station replacement, as well as the new pump station and water storage tank that will be constructed if Alternative #1 is implemented. Figure 5 in the Appendix depicts only the replacement of one section of waterline and pump station, as well as adding a new pump station and water storage tank if Alternative #2 is chosen.

5.4 Environmental Impacts

The environmental impacts of this project are minimal, as the area has been previously disturbed and the right-of-way for the waterlines have been previously cleared. However, there are differences in impacts between the two alternatives. Alternative #1 will construct all the waterlines, pump stations, and tank in a single construction period. In this way, the impacts to the environment will be limited to the time of construction. Alternative #2 will require environmental disturbance at multiple, separate time periods. The overall environmental impact of Alternative #2 would be greater, due to the necessity of multiple, separate construction periods. Both alternatives were assessed, and the resources that may be potentially affected are streams and local waterways, and the soils surrounding the pipeline right-of-way. An Environmental Report will be completed at a later date to further determine the environmental impacts once an alternative is chosen.

5.5 Land Requirements

The land where the line replacement will be executed is on an existing right-of-way from the Kentucky Department of Transportation and residential landowners. In order to proceed with the project, an encroachment permit from the County and Kentucky Department of Highways will need to be obtained. The location for the pump station and tank sites will be on an easement that has been acquired by the District.

5.6 Potential Construction Problems

Both alternatives would face similar construction issues. The lines that are to be replaced may cause minimal traffic concerns depending on work space in the right-of-way. Utilizing traditional open trench and backfill construction, there could be daily lane closures until the new sections of line were in place, but are not likely. Another concern that was considered while evaluating potential construction problems that each alternative might face is the severity of tree removal. The land area where new lines are to be constructed will be minimal and due to the construction on existing right-of-way, tree removal is not a likely concern. If tree removal is deemed necessary though, the removal or mitigation

operations will be conducted in accordance with the Endangered Species Act (ESA) Compliance Options listed in the Version 2: June 2016, Revised Conservation Strategy for Forest Dwelling Bats published by the U.S. Fish and Wildlife Service, Kentucky Field Office. Both alternatives have been analyzed, and there are no other foreseeable construction issues beyond these which have been addressed.

5.7 Sustainability Considerations

For sustainability considerations, both alternatives would utilize PVC pipe in their design. PVC pipe has many advantages over similar specification metal pipe. Some of these advantages include energy efficiency (both in manufacturing effort as well as pumping costs for the Owner), NSF sustainability certification, lower purchase and construction costs per linear foot, as well as widely and readily available. PVC pipe is also formed with inert materials, which makes it less susceptible to corrosion. Also, AWWA, an industry leader in water treatment and distribution, has performed and analyzed the results of a recent study concerning the longevity of PVC pipe. The study results showed that PVC pipe has a useful life of well over 100 years. With this product's performance, advantages, and useful design life of at least 50 years, ELWD and its potable water customers will be well served for many years to come.

5.8 Cost Estimates

Table 1 on the following page shows the following breakdown of costs associated with the project if Alternative #1 (all waterlines, pump stations, and tank) is chosen. The primary costs considered were legal fees, engineering fees, project construction, contingency, environmental, as well as other miscellaneous costs. Figure 6 in the Appendix shows a detailed Engineer's Opinion of Probable Cost & Estimated User Rate Impact for Alternative #1.

Table 1: Cost Estimate of Alternative #1

Category	**Cost**
Construction	$3,249,200
Contingency	483,280
Administration	35,000
Engineering Design Fee	209,300
Construction Observation	113,600
Preliminary Engineering Report	12,000
Geotechnical Report	15,000
Environmental Study	15,000
Legal	25,000
Land	20,000
Interest	80,000
Total Project Cost	**$4,257,380**

Table 2 below shows the following breakdown of costs associated with the project if Alternative #2 (reduced project) is chosen. The primary costs considered were legal fees, engineering fees, project construction, contingency, environmental, as well as other miscellaneous costs. Figure 7 in the Appendix shows a detailed Engineer's Opinion of Probable Cost & Estimated User Rate Impact for Alternative #2.

Table 2: Cost Estimate of Alternative #2

Category	Cost
Construction	$2,523,140
Contingency	252,360
Administration	35,000
Engineering Design Fee	187,500
Construction Observation	108,200
Preliminary Engineering Report	12,000
Geotechnical Report	15,000
Environmental Study	15,000
Legal	25,000
Land	20,000
Interest	80,000
Total Project Cost	**$3,273,200**

6.0 SELECTION OF AN ALTERNATIVE

6.1 Life Cycle Cost Analysis

Tables 3 and 4 show the Life Cycle Cost Analysis for the project alternatives, as well as the values for planning period and discount rate that were used when performing the calculations. To interpret the results of the Life Cycle Cost Analysis, it is important to understand the contextual situation of the analysis. Since both of the alternatives aim to complete the same task, this is considered to be a fixed output analysis. Whichever alternative has the lowest net present value (NPV) is the alternative that should be chosen.

The Annual Operation and Maintenance (O&M) values used in the analysis were obtained by increasing the 2022 O&M values by 4 percent per year for 3 years, with slight changes made based on the 2025 projections to obtain the Transmission and Distribution value. In Alternative #1, Transmission and Distribution was reduced by 20 percent due to the completion of the full project. In Alternative #2, Transmission and Distribution was reduced by 10 percent due to only half of the line replacement being constructed and increases in materials costs for reactive maintenance along Hal Rogers Parkway and McWhorter Road. Tables 3 and 4 are the expected values for the first year of operation (2025) for Alternatives #1 and #2, respectively.

Table 3: Alternative #1 Life Cycle Cost Analysis			
Capital Expense			$4,257,380.00
Annual O&M			
Purchased Water and Power		$2,010,601.00	
Water Treatment		55,700.00	
Transmission and Distribution		610,981.00	
Administration of Customer Accounts		386,183.00	
Administration and General		194,820.00	
Total O & M Cost		$3,258,285.00	
USPW Factor	x	18.99	
Present Worth; Annual O&M			$61,874,832.00
Salvage Value			
Existing Facilities		$4,834,857.00	
Proposed Improvements		1,949,520.00	
Total Salvage Value		$6,784,377.00	
SPPW Factor	x	0.91	
Present Worth; Salvage			$6,173,783.00
Net Present Value:			**$59,958,429.00**

Table 4: Alternative #2 Life Cycle Cost Analysis			
Capital Expense			$3,273,200 .00
Annual O&M			
Purchased Water and Power		$2,010,601.00	
Water Treatment		55,700.00	
Transmission and Distribution		687,353.00	
Administration of Customer Accounts		386,183.00	
Administration and General		194,820.00	
Total O & M Cost		$3,334,657.00	
USPW Factor	x	18.99	
Present Worth; Annual O&M			$63,325,136.00
Salvage Value			
Existing Facilities		$4,834,857.00	
Proposed Improvements		1,513,884.00	
Total Salvage Value		$6,348,741.00	
SPPW Factor	x	0.91	
Present Worth; Salvage			$5,777,355.00
Net Present Value:			**$60,820,982.00**

Notes and Equations Used in Life Cycle Cost Analysis:

Interest Rate (i) = 0.5%
Planning Period (n) = 20 years
Estimated Purchased Water and Power = (Existing Purchased Water and Power x 1.02^3) x 0.85
Estimated Transmission and Distribution for Alternative #1
= (Existing Transmission and Distribution x 1.02^3) x 0.9
Estimated Transmission and Distribution for Alternative #2
= (Existing Transmission and Distribution x 1.02^3) x 0.95
Salvage Value; Existing Facilities = Straight Line Depreciation value from utility's financial statement
Salvage Value; Proposed Improvements = Straight Line Depreciation of construction cost from PER
Assumed life of 50 years, depreciated over 20 years

$$NPV = \text{Capital} + (\text{USPW} * \text{Total O\&M}) - (\text{SPPW} * \text{Total Salvage Value})$$

$$Uniform\ Series\ Present\ Worth\ Factor\ (USPW) = \frac{(1+\mathrm{i})^{\mathrm{n}} - 1}{\mathrm{i}(1+\mathrm{i})^{\mathrm{n}}}$$

$$Example\ USPW = \frac{((1+.005)^{20} - 1)}{(.005(1+.005)^{20})} = 18.99$$

$$Single\ Payment\ Present\ Worth\ Factor\ (SPPW) = (1+\mathrm{i})^{-\mathrm{n}}$$

$$Example\ SPPW = (1+.005)^{-20} = 0.91$$

6.2 Non-Monetary Factors

There are two technically feasible alternatives being considered, and there were no foreseeable non-monetary factors that would play a role in this project if either of the project alternatives were chosen.

7.0 PROPOSED PROJECT

7.1 Preliminary Project Design

It is upon recommendation of the project engineer that Alternative #1 (all waterlines, pump stations, and tank) be constructed. Based upon current conditions, client budget, environmental impacts, and future forecasting, Alternative #1 will be most effective in meeting the needs of the client. As this project is a drinking water project, the following items need to be addressed:

7.1.1 Project Layout: The primary focus of this project is to replace existing water lines, upgrade one booster pump station, and add a booster pump station and water storage tank. Waterlines along Old Salem Road, Maplesville School Road, and Hal Rogers Parkway have given the District problems over the years with leaks and breaks due to the lines being undersized and the increased demand in the system. These lines will be replaced and upgraded from 3" PVC pipe to 6" PVC, SDR-17 pipe along Old Salem Road and Maplesville School Road. The portion of waterline on Hal Rogers Parkway will not change in size but will upgrade to a new 16" D.I. CL 350 that will sit closer the road and will be easier to maintain in the future. These lines will be far less susceptible to breaks and leaks due to the upgrade in pressure classification, which currently plagues the existing lines. In addition, all tie-ins and meters along KY 80 will be connected to the

existing 16” D.I. CL 350 waterline and abandoning the 6” AC waterline. The new lines will also provide increased hydraulic capacity to serve the extents of ELWD’s system for many years to come. Along with these line replacements, the pump station along E Pittsburg Church Road will be upgraded and one booster pump station and elevated water storage tank will be added, both located along KY 472. The pump station along E Pittsburg Church Road has performed well, but has reached the end of its usable life due to increased demands in these areas of the system. New, more efficient pumps will be installed in the pump station and will be equipped with telemetry communications to allow for the District to save on operational costs. The booster pump station and water storage tank along KY 472, as well as a 6” PVC, SDR-17 waterline with Master Meter that will be added along McWhorter Road tying into the Wood Creek Water District system, will help to increase pressure and capacity in this area of the distribution system. With the new waterlines, pump stations and tank, East Laurel Water District will now be able to reliably and efficiently provide water across the system for the foreseeable future without issue.

7.2 Project Schedule

Table 5 shown below contains the proposed completion dates for the major project components. This list is not exhaustive of all project tasks, and the dates shown are tentative.

Table 5: Estimated Project Schedule

Category	Estimated Date
Environmental Review Submittal	June 1, 2023
Bid Opening	May 1, 2024
Construction Start	July 1, 2024
Construction Completion	February 1, 2025

7.3 Permit Requirements

Table 6 shown below is a tentative list of permits and approvals that will need to be obtained before project construction can begin. This list is preliminary and is subject to change following the review process of the required agencies.

Table 6: Permits & Approvals Needed

Agency	Permit or Approval
KY Division of Water	Approval of Plans & Specifications
KY Division of Water	KPDES Permit
KY Division of Water	Stream Construction Permit
KY Department of Transportation	Encroachment Permit

7.4 Total Project Cost Estimate

Table 7 shown on the following page is a summarized version of the Engineer’s Opinion of Probable Cost for the recommended alternative as described above. The detailed Engineer’s Opinion of Probable Cost is included in the Appendix as Figure 6.

Table 7: Total Project Cost Estimate	
Category	**Cost**
Construction	$3,249,200
Contingency	483,280
Administration	35,000
Engineering Design Fee	209,300
Construction Observation	113,600
Preliminary Engineering Report	12,000
Geotechnical Report	15,000
Environmental Study	15,000
Legal	25,000
Land	20,000
Interest	80,000
Total Project Cost	**$4,257,380**

7.5 Excess Funding Disbursement

Any remaining funds leftover after the project has been substantially completed will be used to fund the following items as needed or deemed most appropriate by the East Laurel Water District: a 3" PVC waterline will be installed up Hodge Road, replacing approximately 1,100 LF of 12" D.I. waterline with 16" D.I. waterline near North Laurel High School, and/or for purchase of Radio Read Water Meters. A site map of the two additive Alternates are attached as Figure 8 in the Appendix.

7.6 Annual Operating Budget

Table 8 shown below is a summarized version of the Existing Operating Budget for Year Ending 2022 and proposed operation and maintenance costs upon project completion. The full Existing Operating Budget for Year Ending 2022 is included in the Appendix as Figure 3.

Table 8: Annual Operation & Maintenance Cost		
Category	**Existing**	**Proposed**
Purchased Water and Power	$1,787,416	$2,010,601
Water Treatment	49,517	55,700
Transmission and Distribution	706,108	610,981
Administration of Customer Accounts	343,315	386,183
Administration and General	173,194	194,820
Total Operation & Maintenance Cost	**$ 3,059,550**	**$3,258,285**

8.0 CONCLUSIONS AND RECOMMENDATIONS

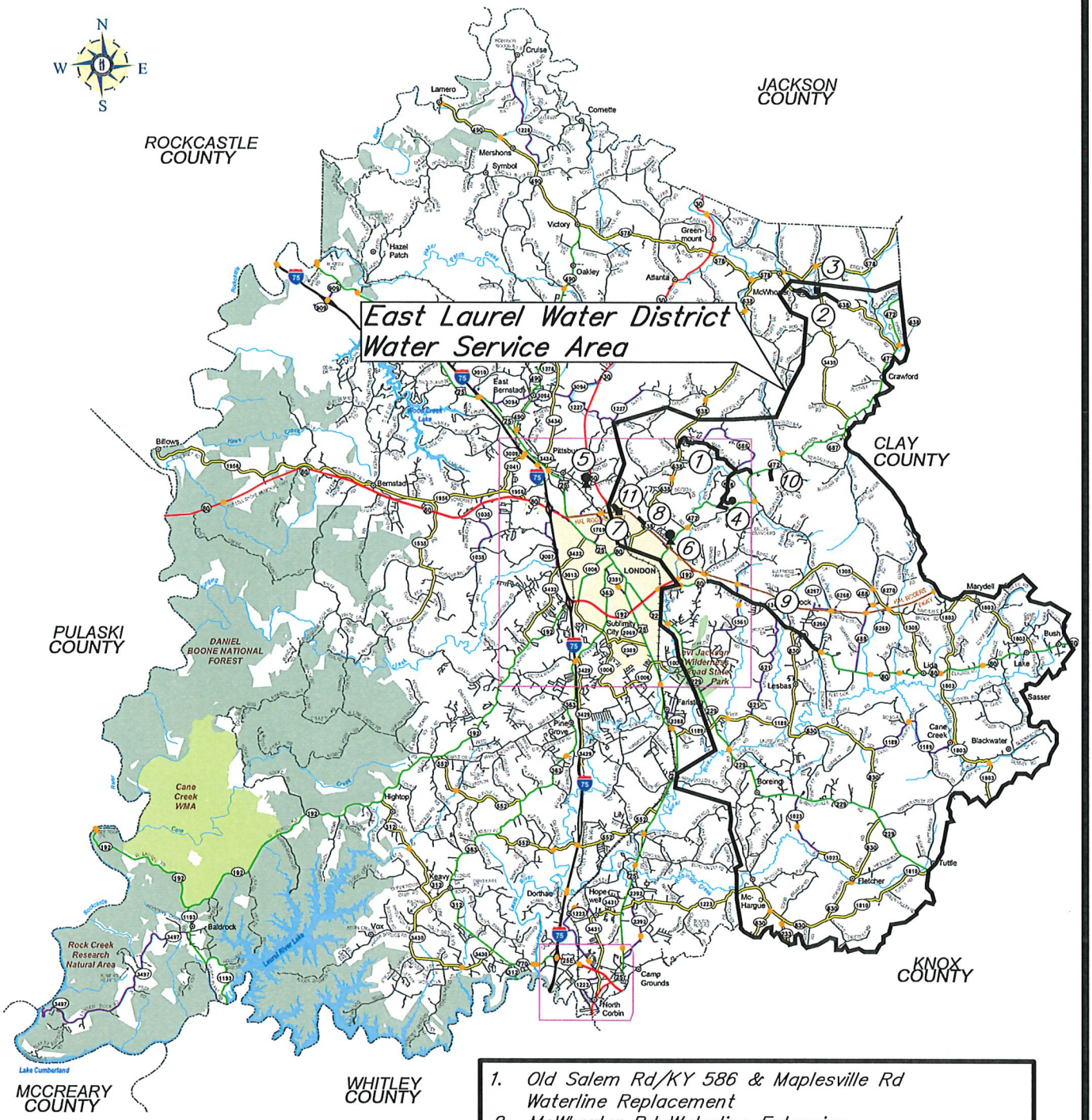
It is the conclusion and recommendation of this report that the East Laurel Water District implement the project as described in the Proposed Project section of this report. It is further recommended that ELWD proceed with its applications for project funding assistance.

An evaluation of the revenue needed for the proposed project was conducted to determine the project's impact on the water rates. The evaluation of estimated user rate impact can be found in Figure 6 of the Appendix. Based on the evaluation of the revenue needed for debt repayment from the proposed project, the user rates will need to be increased 5.19% to finance the proposed project.

As mentioned in a previous section of this Report, a Summary Addendum to Preliminary Engineering Report will be completed at a later date. This document will outline the project feasibility, and determine the final rate increase needed based on more in-depth analysis of the utility's most recent financial statements.

APPENDIX

FIGURE 1



KENVIRONS
Civil & Environmental Engineers

Project:	2020052
Checked By:	JDS
Date:	9/2021
Scale:	1"=2,000'

EAST LAUREL WATER DISTRICT TOPOGRAPHIC LOCATION MAP LAUREL COUNTY, KENTUCKY

FIGURE 2

Figure 2
Laurel County, KY - Projections for Population & Water Usage

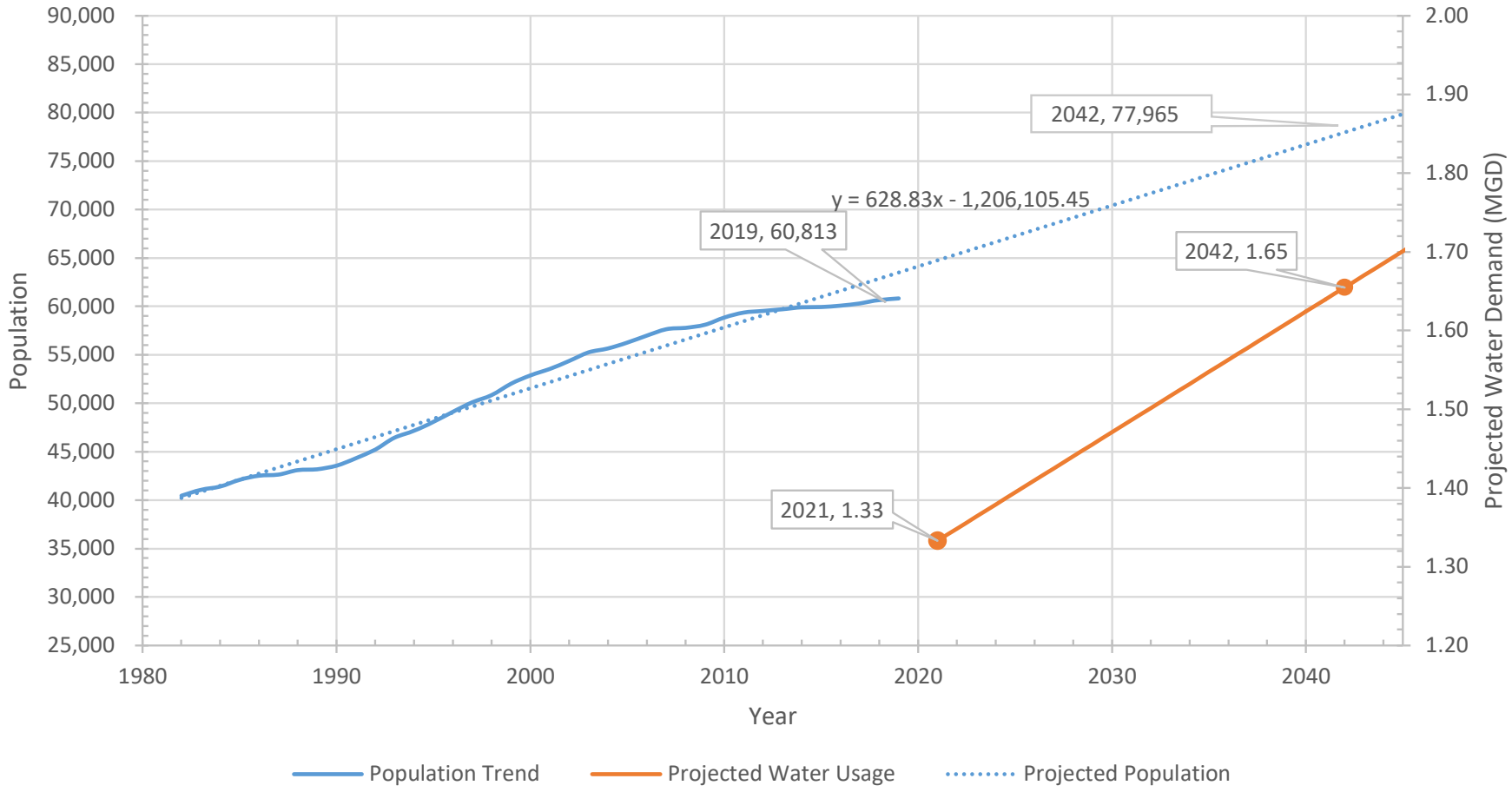


FIGURE 3

EAST LAUREL WATER DISTRICT
Existing Operating Budget
For Year Ending 2022

REVENUE REQUIREMENTS		
Operation & Maintenance Expenses		
Purchased Water and Power	$ 1,787,416.00	
Water Treatment	$ 49,517.00	
Transmission and Distribution	$ 706,108.00	
Administration of Customer Accounts	$ 343,315.00	
Administration and General	$ 173,194.00	
		$ 3,059,550.00
Debt Service		
Annual Principal & Interest	$ 141,189.00	
		$ 141,189.00
Debt Service Coverage, Reserve, & Service Fees		
RD	$ 7,275.00	
		$ 7,275.00
TOTAL REVENUE REQUIREMENTS		**$ 3,208,014.00**
UTILITY INCOME		
Operating Revenues		
Water Sales	$ 2,876,403.00	
Tap-On Fees	$ 56,700.00	
Other Operating Income	$ 131,446.00	
		$ 3,064,549.00
Non-Operating Revenues (Expenses)		
Interest Income	$ 1,284.00	
Grant Income	$ -	
Miscellaneous	$ (5,908.00)	
Amortization	$ (10,155.00)	
		$ (14,779.00)
TOTAL UTILITY INCOME		**$ 3,049,770.00**

FIGURE 4

Proposed Pump Station Upgrade
Lat: 37° 9' 19" N
Long: 84° 5' 31" W

New Proposed Master Meter
Lat: 37° 8' 45" N
Long: 84° 4' 48" W

Proposed 16" D.I. Waterline
Lat: 37° 8' 29" N
Long: 84° 4' 2" W

New Proposed Pump Station
Lat: 37° 7' 59" N
Long: 84° 31' 10" W

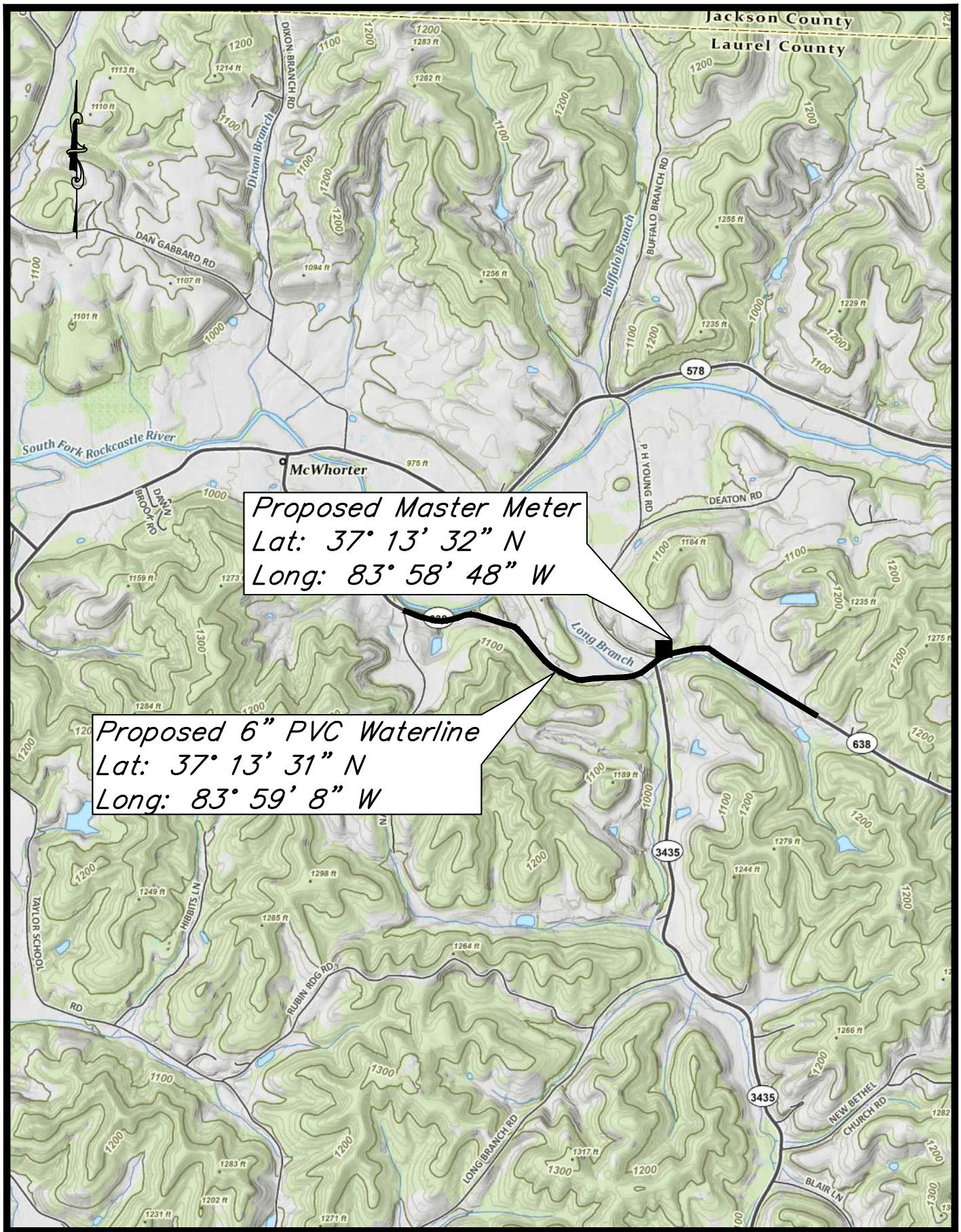
Proposed 6" PVC Waterline
Lat: 37° 9' 52" N
Long: 84° 1' 49" W

New 139,000 Gallon Ground Water Storage Tank
Lat: 37° 8' 53" N
Long: 84° 1' 29" W

KENVIRONS
Civil & Environmental Engineers

Project:	2020052
Checked By:	JDS
Date:	9/2021
Scale:	1"=2,000'

EAST LAUREL WATER DISTRICT
TOPOGRAPHIC LOCATION MAP
LAUREL COUNTY, KENTUCKY



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EAST LAUREL WATER DISTRICT
TOPOGRAPHIC LOCATION MAP
LAUREL COUNTY, KENTUCKY

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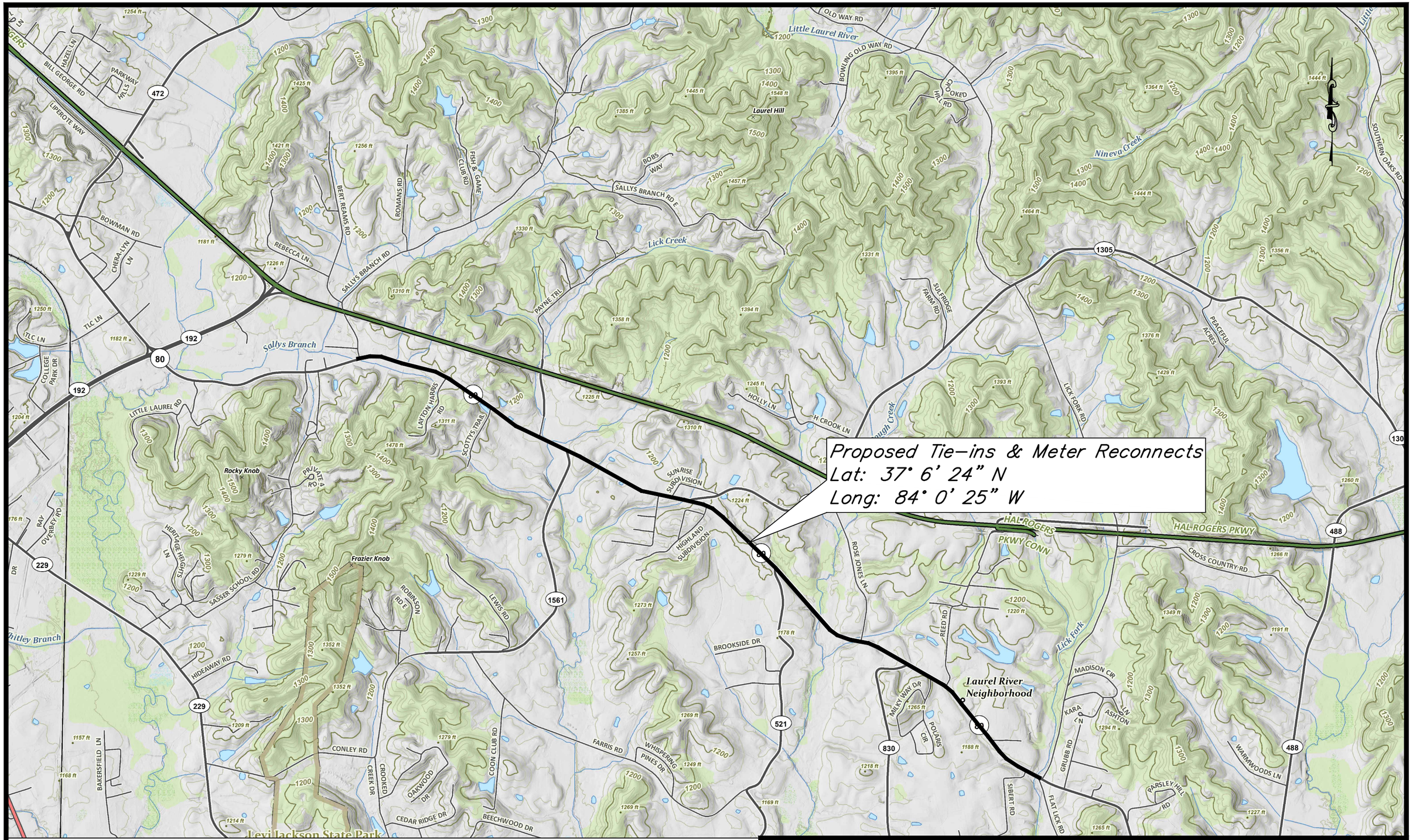

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Civil & Environmental Engineers

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EAST LAUREL WATER DISTRICT
TOPOGRAPHIC LOCATION MAP
LAUREL COUNTY, KENTUCKY

FIGURE 5

Proposed Pump Station Upgrade
Lat: 37° 9' 19" N
Long: 84° 5' 31" W

Proposed 6" PVC Waterline
Lat: 37° 9' 52" N
Long: 84° 1' 49" W

New Proposed Master Meter
Lat: 37° 8' 45" N
Long: 84° 4' 48" W

New 139,000 Gallon Ground Water Storage Tank
Lat: 37° 8' 53" N
Long: 84° 1' 29" W

New Proposed Pump Station
Lat: 37° 7' 59" N
Long: 84° 31' 10" W

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EAST LAUREL WATER DISTRICT
TOPOGRAPHIC LOCATION MAP
LAUREL COUNTY, KENTUCKY

FIGURE 6

East Laurel Water District

Alternative #1 (Water System Improvements)

Opinion of Probable Cost

August 10, 2023

Item No.	Item	Unit	Quantity	Unit Price	Item Price
1	16" D.I. CL 350 Pipe	LF	1,000	$100.00	$100,000.00
2	6" PVC SDR 17 Pipe	LF	29,610	38.00	1,125,180.00
3	3" PVC SDR 17 Pipe	LF	130	25.00	3,250.00
4	2" PVC SDR 17 Pipe	LF	20	20.00	400.00
5	Bored Encasement for 6" Pipe	LF	230	200.00	46,000.00
6	Bored Encasement for 3" Pipe	LF	75	180.00	13,500.00
7	Open Cut Encasement for 6" Pipe	LF	125	120.00	15,000.00
8	6" Gate Valve	EA	6	1,500.00	9,000.00
9	6" Directional Creek Crossing (Long Branch)	LS	1	30,000.00	30,000.00
10	6" Directional Creek Crossing (Little Laurel)	LS	1	50,000.00	50,000.00
11	6" Creek Crossing	LS	4	15,000.00	60,000.00
12	Tie-In to Existing 16" Water Line	EA	2	8,000.00	16,000.00
13	Tie-In to Existing 4" Water Line	EA	5	3,000.00	15,000.00
14	Tie-In to Existing 3" Water Line	EA	3	2,500.00	7,500.00
15	Tie-In to Existing 2" Water Line	EA	3	2,000.00	6,000.00
16	16"x6" Tapping Sleeve & Valve	EA	3	10,000.00	30,000.00
17	16"x4" Tapping Sleeve & Valve	EA	1	8,000.00	8,000.00
18	16"x3" Tapping Sleeve & Valve	EA	5	7,000.00	35,000.00
19	6"x6" Tapping Sleeve & Valve	EA	6	3,500.00	21,000.00
20	Cut & Cap	EA	11	1,000.00	11,000.00
21	6" Free Bore	LF	280	100.00	28,000.00
22	Customer Reconnection	EA	70	500.00	35,000.00
23	3/4" Service Line	LF	4,658	15.00	69,870.00
24	Fire Hydrant	EA	7	8,000.00	56,000.00
25	350 GPM Pump Station	LS	1	400,000.00	400,000.00
26	Master Meter	LS	2	43,000.00	86,000.00
27	East Laurel Pump Station Upgrade	LS	1	350,000.00	350,000.00
28	139,000 Gallon Ground Storage Tank	LS	1	550,000.00	550,000.00
29	SCADA	EA	2	25,000.00	50,000.00
30	Crushed Stone	LF	500	20.00	10,000.00
31	Light Duty Bituminous	LF	250	50.00	12,500.00
	Total Construction Cost				**$3,249,200.00**

Summary of Costs for Alternative #1

Total Estimated Construction Cost	$3,249,200.00
Contingency	483,280.00
Administration	35,000.00
Engineering Design	209,300.00
Construction Observation	113,600.00
Preliminary Engineering Report	12,000.00
Geotechnical Report	15,000.00
Environmental Study	15,000.00
Legal	25,000.00
Land	20,000.00
Interest	80,000.00
TOTAL PROJECT COST	**4,257,380.00**

Estimated User Rate Impact

Alternative #1 (Water System Improvements)

FUNDING:	
Cleaner Water (FY 2022)	$448,640.00
Cleaner Water (FY 2023)	$794,380.00
RD Loan (70%)	$2,110,050.00
RD Grant (30%)	$904,310.00
TOTAL PROJECT FUNDING	**$4,257,380.00**

REVENUE REQUIREMENT:	
RD Annual Principal & Interest Payment	$73,793
Loan Coverage @ 10%	$7,379
Depreciation/Short Lived Assets	$52,751
Total Annual Expense	$133,923

Number of Existing Customers	5,547
Additional Revenue Per Bill	$2.01

	Current Rates	**Proposed Rates**
First 2,000 Gallons	$21.61	$23.62
Next 2,000 Gallons	$8.57	$8.57
Next 2,000 Gallons	$8.33	$8.33
Next 4,000 Gallons	$7.55	$7.55
All Over 10,000 Gallons	$6.90	$6.90
Cost for 4,000 gallons	$38.75	$40.76
	Percent Increase	**5.19%**

FIGURE 7

East Laurel Water District

Alternative #2 (Reduced Project)

Opinion of Probable Cost

August 10, 2023

Item No.	Item	Unit	Quantity	Unit Price	Item Price
1	6" PVC SDR 17 Pipe	LF	22,480	38.00	854,240.00
2	Bored Encasement for 6" Pipe	LF	120	200.00	24,000.00
3	Open Cut Encasement for 6" Pipe	LF	90	120.00	10,800.00
4	6" Gate Valve	EA	5	1,500.00	7,500.00
5	6" Directional Creek Crossing (Little Laurel)	LS	1	50,000.00	50,000.00
6	6" Creek Crossing	LS	4	15,000.00	60,000.00
7	Tie-In to Existing 4" Water Line	EA	2	3,000.00	6,000.00
8	Tie-In to Existing 3" Water Line	EA	1	2,500.00	2,500.00
9	6"x6" Tapping Sleeve & Valve	EA	3	3,500.00	10,500.00
10	6" Free Bore	LF	265	100.00	26,500.00
11	Customer Reconnection	EA	30	500.00	15,000.00
12	3/4" Service Line	LF	1,200	15.00	18,000.00
13	Fire Hydrant	EA	4	8,000.00	32,000.00
14	350 GPM Pump Station	LS	1	400,000.00	400,000.00
15	Master Meter	LS	1	43,000.00	43,000.00
16	East Laurel Pump Station Upgrade	LS	1	350,000.00	350,000.00
17	139,000 Gallon Ground Storage Tank	LS	1	550,000.00	550,000.00
18	SCADA	EA	2	25,000.00	50,000.00
19	Crushed Stone	LF	430	20.00	8,600.00
20	Light Duty Bituminous	LF	90	50.00	4,500.00
	Total Construction Cost				**$2,523,140.00**

Summary of Costs for Alternative #2

Total Estimated Construction Cost	$2,523,140.00
Contingency	252,360.00
Administration	35,000.00
Engineering Design	187,500.00
Construction Observation	108,200.00
Preliminary Engineering Report	12,000.00
Geotechnical Report	15,000.00
Environmental Study	15,000.00
Legal	25,000.00
Land	20,000.00
Interest	80,000.00
TOTAL PROJECT COST	**3,273,200.00**

Estimated User Rate Impact
Alternative #2 (Reduced Project)

FUNDING:	
Cleaner Water (FY 2022)	448,640.00
Cleaner Water (FY 2023)	794,380.00
RD Loan (70%)	$1,421,130.00
RD Grant (30%)	$609,050.00
TOTAL PROJECT FUNDING	**$3,273,200.00**

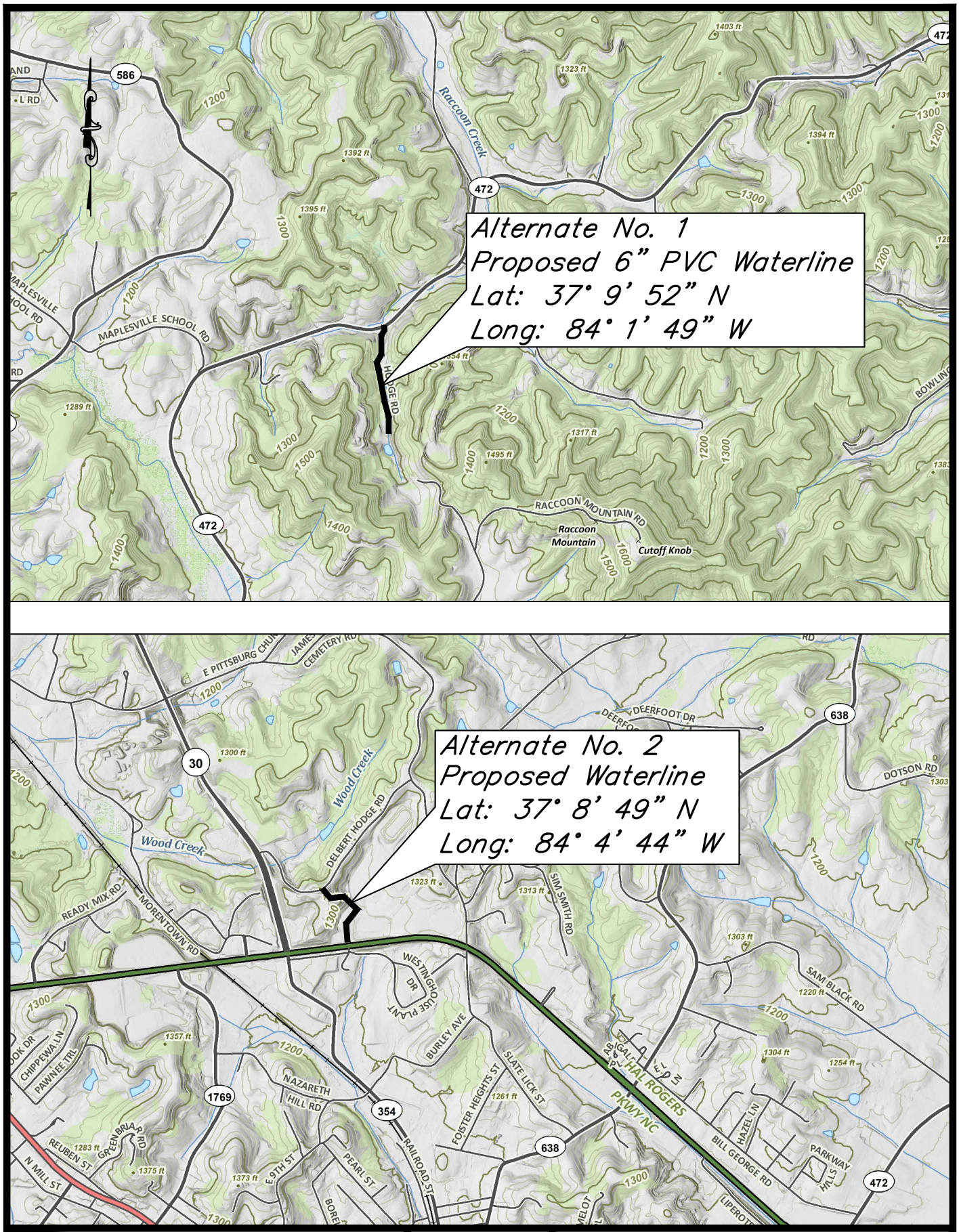
REVENUE REQUIREMENT:

RD Annual Principal & Interest Payment	$49,700
Loan Coverage @ 10%	$4,970
Depreciation/Short Lived Assets	$35,528
Total Annual Expense	$90,198

Number of Existing Customers	5,547
Additional Revenue Per Bill	$1.36

	Current Rates	**Proposed Rates**
First 2,000 Gallons	$21.61	$22.97
Next 2,000 Gallons	$8.57	$8.57
Next 2,000 Gallons	$8.33	$8.33
Next 4,000 Gallons	$7.55	$7.55
All Over 10,000 Gallons	$6.90	$6.90
Cost for 4,000 gallons	$38.75	$40.11
	Percent Increase	**3.50%**

FIGURE 8



KENVIRONS
Civil & Environmental Engineers

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Scale:	1"=2,000'

EAST LAUREL WATER DISTRICT
TOPOGRAPHIC LOCATION MAP
LAUREL COUNTY, KENTUCKY