



**PRELIMINARY ENGINEERING REPORT**  
**FOR**  
**EAST CASEY COUNTY WATER DISTRICT**

**2020 SYSTEM UPGRADES**

**PREPARED BY**

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## **INTRODUCTION**

The East Casey County Water District (ECCWD) serves virtually all of Casey County except for the City of Liberty, as well as small areas of Adair, Lincoln, Pulaski, and Russell County. The purpose of this project is to increase the capacity to a growing region of Casey County, replace aging and obsolete equipment and improve service and water quality to the existing customers of East Casey County Water District.

The District presently meets the water needs of its customers by purchasing an average of 1,000,000 GPD from 4 suppliers. The City of Liberty alone provides over 75% of the treated water to the East Casey County Water District and has sufficient capacity to provide the additional potable water necessary for this project. The other water providers are Russell Springs, Eubank, and Campbellsville.

Some of the existing pump stations and water tanks throughout the system are outdated and have reached the end of their usable lives. Collectively, the District is aiming to upgrade the Shugars Hill Pump Station, replace the Walnut Hill Pump Station and Henson Creek Hydro Pneumatic Pump Station with a new above ground pump stations, construct a 200,000 gallon elevated tank, repaint and add a mixing system to the existing Nubbin Tank, and purchase 1,000 Hersey Hot Rod AMRs, six telemetry units, and five 8" insert valves in this project. The project will focus on the existing tank and pump station replacement stated above, but one alternative has been discussed that would replace the existing underground Crossroads Pump Station with a new above ground pump station if funds remain at the completion of the original project. This project will be an essential step in supporting the growth of the ECCWD system.

## **1.0 PROJECT PLANNING**

### **1.1 Location**

Founded in 1806, Casey County is situated in the south-central region of Kentucky. Liberty serves as the County Seat for Casey County, and is near the geographic center of the County. As stated previously, East Casey County Water District is a rural water utility system. The purpose of the ECCWD is to establish, develop, and operate a distribution system for its customers in Casey County outside of the City of Liberty as well as small areas of Adair, Lincoln, Pulaski, and Russell County. Since the inception of the ECCWD, there has been a steady rise in demand for clean, potable drinking water. This project will help East Casey County 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 in the Appendix.

### **1.2 Environmental Resources Present**

The proposed project is located across the eastern portion of Casey County. According to the Soil Survey of Casey County, Kentucky, prepared by the USDA Soil Conservation Service, the major natural resources in the area are soil, water, timber, oil, and limestone. The largest and most important of these resources is the soil because it is the main resource to produce food and fiber. Casey County has an approximate land

area of 446 square miles. Of that, 1.5 square miles is covered by water, and approximately 315 square miles is designated as farmland. The farms are primarily family owned, and the primary crops consist of burley tobacco, corn, soybeans, and hay. Approximately 38 percent of farm income is derived from the sale of crops, principally tobacco, while the remaining 62 percent is obtained from livestock and livestock products. The production of beef cattle and calves and dairy products are the main enterprises. This project will replace some of the old pump stations, maintaining adequate pressure, so that Casey County farmers and residents can continue to grow and maintain their production of products that are essential to the Commonwealth of Kentucky. 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.

### **1.3 Population Trends**

The population of Casey County according to the 2010 Census conducted by the United States Census Bureau was 15,983. The East Casey County Water District currently services 4,780 customers or approximately 12,181 people. This is roughly 76 percent of the Casey County population. Casey County has seen a growth in population since 1980 at a rate of approximately 0.19 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 pump stations and water storage tanks will not be able to withstand the growth. This project will allow Casey County to grow at its current rate and provide users with a sufficient potable water supply.

## **2.0 EXISTING FACILITIES**

### **2.1 Location Map**

A Location Map for the East Casey County Water District distribution system is attached in the Appendix as Figure 1.

### **2.2 History**

The East Casey County Water District was established in 1982 with 265 rural water customers and one maintenance person with billing operations conducted through the office of the Casey County Judge Executive. In 1988, the system began efforts to expand service to additional customers, therefore becoming a viable entity. The District now provides water to nearly 4,800 customers and employs full-time employees to maintain the system's daily operations. In 2004, Contract 14 – Water System Extension Project began construction and ultimately provided service to the remaining densely populated areas of Casey County. Remaining projects will primarily consist of supplying water to the less populated areas which were unable to be served due to hydraulic difficulties that have been alleviated by various system improvements throughout the District. This project will help provide the pressure and storage capacity to reach out to the edges of the District.

## **2.3 Condition of Existing Facilities**

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

**2.3.1 Water Supply and Treatment:** The City of Liberty is the regional provider of treated water in Casey County. The raw water sourced from Lake Liberty, has essentially unlimited quantity along with excellent quality. ECCWD purchases most of its treated water from Liberty at a wholesale rate for distribution in their system through one (1) interconnect on the western border of the City.

The Liberty Water Treatment Plant (WTP) is located at the base of the dam of Lake Liberty on Lake Liberty Street. The plant was originally constructed in 1979 with a major expansion completed in 1997 to bring the design capacity to 2.1 million gallons per day (MGD). The current average daily production is approximately 1.3 MGD. Using data gathered from the East Casey County Water District's monthly operating reports for 2019, the treated water sold to ECCWD was:

Total Annual Volume (approx.): 365,409,100 Gallons  
Daily Average Volume: 1,001,120 Gallons per Day  
Daily Average during Maximum Month (February): 1,189,650 Gallons per Day  
Maximum Day (approx.): 1,808,100 Gallons

**2.3.2 Storage:** East Casey County Water District currently has nine (9) water storage tanks that serve as finished water storage facilities. All finished water is supplied by the City of Liberty, Russell Springs, Eubank, and Campbellsville through various interconnects and is pumped to each of the water storage tanks in the system. The construction dates for these tanks range from 1982-2013 and are regularly inspected to ensure that they are up to code. The volumes of the nine tanks across the system vary from 65,000 to 2,000,000 gallons and have overflow elevations ranging from 1,032'-1,421' above mean sea level. This project will add a 200,000-gallon elevated tank and repaint and install a mixing system to the existing Nubbin Tank.

**2.3.3 Pumping Stations:** East Casey County Water District system has eight (8) pumping stations located in their distribution system. These pumps are located throughout the system and range in performance from 35 gallons per minute (GPM) to 250 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 these booster pump stations have performed well over the years, they have begun to show their age and cannot efficiently meet the increased demands in the system. Based on monthly operating reports from the District, the distributed water that passed through these pump stations are as shown on the following page:

**Shugars Hill Pump Station:**

Annual Volume: 102,200,000 Gallons  
Daily Average Volume: 280,000 Gallons per Day (GPD)  
Daily Average during Maximum Month (February): 332,600 GPD  
Maximum Day (approx.): 360,000 GPD

**Walnut Hill Pump Station:**

Annual Volume: 5,475,000 Gallons  
Daily Average Volume: 150,000 Gallons per Day (GPD)  
Daily Average during Maximum Month (February): 178,200 GPD  
Maximum Day (approx.): 270,900 GPD

**Henson Creek Hydro Pneumatic Pump Station:**

Annual Volume: 365,000 Gallons  
Daily Average Volume: 10,000 Gallons per Day (GPD)  
Daily Average during Maximum Month (February): 11,900 GPD  
Maximum Day (approx.): 18,000 GPD

**Crossroads Pump Station:**

Annual Volume: 29,200,000 Gallons  
Daily Average Volume: 80,000 Gallons per Day (GPD)  
Daily Average during Maximum Month (February): 95,000 GPD  
Maximum Day (approx.): 144,500 GPD

The pumps at Shugars Hill, Walnut Hill, Henson Creek, and Crossroads Pump Stations generally run at the rate of 250, 250, 30, and 120 GPM, respectively. At these pumping rates, the approximate duration of the pumps operations at these four pump stations during 2019 was:

**Shugars Hill Pump Station:**

Annual Average Day: 18 hours (78% of capacity)  
Maximum Month Average Day: 22 hours (92% of capacity)  
Maximum Day: 24 hours (100% of capacity)

**Walnut Hill Pump Station:**

Annual Average Day: 10 hours (42% of capacity)  
Maximum Month Average Day: 12 hours (50% of capacity)  
Maximum Day: 18 hours (75% of capacity)

**Henson Creek Hydro Pneumatic Pump Station:**

Annual Average Day: 5.5 hours (23% of capacity)  
Maximum Month Average Day: 6.6 hours (28% of capacity)  
Maximum Day: 10 hours (42% of capacity)

### **Crossroads Pump Station:**

Annual Average Day: 11 hours (46% of capacity)

Maximum Month Average Day: 13 hours (55% of capacity)

Maximum Day: 20 hours (84% of capacity)

**2.3.4 Distribution System:** The East Casey County Water District water distribution system carries a large volume of water through its network of lines. The current distribution system network totals around 570 miles of water distribution lines ranging from 3-inch to 10-inch diameter. The distribution system is in good operating condition and few major capital expenses are anticipated in the near future. The system is presently operating within the State Division of Water and Federal Safe Drinking Water Standards.

## **2.4 Financial Status of Existing Facilities**

The financial status of the East Casey County Water District is summarized in the 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 the utility from 2019.

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 utilities most recent financial statements.

## **3.0 NEED FOR PROJECT**

### **3.1 Health, Sanitation, and Security**

This project will consist of replacing two underground pump stations, Walnut Hill and Henson Creek, with above ground pump stations, rehabilitating one booster pump station, Shugars Hill, and an existing water storage tank, constructing a 200,000 gallon elevated water storage tank, purchasing 1,000 automatic read water meters and six SCADA units, and installing five 8" insertion valves. If funds remain, the existing underground Crossroads Pump Station will be replaced with an above ground pump station as Alternative #1. As mentioned in previous sections, the existing pump stations have been in service prior to the significant growth that ECCWD has seen since its creation and are undersized for the demand needed in their respective areas of the system at the present time. The replacement of these aging pump stations will ensure that the District 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 the ECCWD water system.

### **3.2 Aging Infrastructure**

The existing Shugars Hill, Walnut Hill, and Crossroads booster pump stations as well as the Henson Creek hydro pneumatic sump station have performed well over the years; however they have reached the end of their usable lives due to the increased demand across the system in recent years. The existing Nubbin Tank will need to be repainted



and a mixing system will be added along with an elevated water storage tank being constructed alongside the existing tank. ECCWD will also replace 1,000 existing manual read water meters with new Hersey Hot Rod AMR meters to stay compliant with Kentucky Public Service Commission regulations. This project will give East Casey County Water District a more efficient and reliable system that can easily sustain future growth throughout Casey County.

### **3.3 Reasonable Growth**

A detailed computer based hydraulic model has been developed for the East Casey County Water District and has been updated over several years to reflect current system conditions. The replacement of four pump stations, addition of a water storage tank, and the rehabilitation of another water storage tank would allow for the area of eastern Casey 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, after completion of the project, providing an approximation to the year 2042. The population and water usage growth pattern was graphed, and is shown in Figure 2 in the Appendix. According to the graph, the population of Casey County will be approximately 17,400 people by the year 2042. The East Casey County Water District has a current customer base of approximately 4,780 with an average usage of about 0.91 MGD. Assuming the same population growth pattern of approximately 0.19 percent per year applies, a customer base of approximately 5,000 would require roughly 0.95 MGD by the year 2042. This is an increase of approximately 4 percent over the current demand.

## **4.0 ALTERNATIVES CONSIDERED**

### **4.1 Description**

After consulting with the client, 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 (1) the proposed plan outlined in this report (water storage tank and pump station addition/replacement/rehabilitation), or (2) reduce the project to exclude the new telemetry units and the tank repainting and mixing system installation. This second alternative would involve procuring the funding for the above-mentioned items at a later date. The final alternative that could be chosen is not technical in nature but is an option the client is facing. This alternative is to simply not do the project and continue the current practice of repairing the problematic pump stations when they occur (reactive maintenance). This has been a substantial cost for the client due in part to labor needed to repair these facilities. 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 the client.

## 4.2 Design Criteria

Both technically feasible designs must be able to supply the current customer load of approximately 4,780 with the ability to withstand the growth determined in section 3.3 of this report. The current average daily demand for water through the entire system is approximately 0.91 MGD, with a total of 0.52 MGD passing through the pump stations being replaced and upgraded in this project. With a growth rate of approximately 0.19 percent per year, the average daily demand is estimated to grow to 0.95 MGD, with approximately 0.59 MGD passing through the pump stations in this project. The design criteria for each pump station in this project is shown below:

**Shugars Hill Pump Station: 0.36 MGD or 250 GPM**

**Walnut Hill Pump Station: 0.45 MGD or 310 GPM**

**Henson Creek Hydro Pneumatic Pump Station: 0.06 MGD or 45 GPM**

**Crossroads Pump Station: 0.22 MGD or 150 GPM**

Due to the small population growth rate in Casey County, design capacities of each pump station will only increase marginally. The Walnut Hill and Crossroads Pump Station capacities will be increased by 25% of their existing flow rates, while the Henson Creek and Shugars Hill Pump Stations will be sized based on existing hydraulic capabilities.

## 4.3 Map

Figure 4 in the Appendix shows the locations of the water storage tank and pump station sites that will be replaced or rehabilitated if either alternative is implemented. The rehabilitated water storage tank that will be excluded in Alternative 2 is located directly next of the new water storage tank.

## 4.4 Environmental Impacts

The environmental impacts of this project are minimal, as the area has been previously disturbed. However, there are differences in impacts between the two alternatives. Alternative 1 will replace all the pump stations and tank addition 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 two separate time periods. The environmental impact of Alternative 2 would be greater, due to the necessity of two 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 pump station/tank right-of-way.

## 4.5 Land Requirements

The land where construction 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. Locations for each of the pump station and tank sites are to be on easements that will be acquired by the District prior to construction.

#### 4.6 Potential Construction Problems

Both alternatives would face similar construction issues. The pump stations that are to be replaced may cause minimal traffic concerns depending on workspace in the right-of-way. Utilizing flaggers, there could be daily lane closures if construction occurs too close to the road 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 pump stations and storage tanks are to be constructed will be minimal and due to the construction on existing right-of-way, tree removal is not a likely concern. Both alternatives have been analyzed and there are no other foreseeable construction issues beyond these which have been addressed.

#### 4.7 Sustainability Considerations

For sustainability considerations, both alternatives would utilize variable frequency drives (VFD) in their pump station design, when feasible. VFDs has many advantages over similar pump station designs. Some of these advantages include energy efficiency (both in manufacturing effort as well as pumping costs for owner), as well as reduction of surging upon pump shutdown. With this product's performance and advantages, ECCWD and its potable water customers will be well served for many years to come.

#### 4.8 Cost Estimates

Table 1 shown below contains the following breakdown of costs associated with the project if Alternative 1 (pump station replacements and tank construction) is chosen. The primary costs considered were land & rights fees, engineering fees, project construction, contingency, environmental, as well as other miscellaneous costs. Figure 5 in the Appendix shows a detailed Engineer's Opinion of Probable Cost & Estimated User Rate Impact for Alternative 1.

<b>Category</b>	<b>Cost</b>
Construction	\$1,490,000
Contingency	151,000
Land and Rights	10,000
Engineering	133,800
Inspection	67,100
Bond Counsel	14,700
Local Counsel	5,400
Preliminary Engineering Report	10,000
Environmental Report	8,000
Geotechnical Report	10,000
Capitalized Interest	20,000
<b>Total Project Cost</b>	<b>\$1,920,000</b>

Table 2 shown below contains the following breakdown of costs associated with the project if Alternative 2 (reduced project) is chosen. The primary costs considered were land & rights 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 2.

<b>Table 2: Cost Estimate of Alternative 2</b>	
<b>Category</b>	<b>Cost</b>
Construction	\$1,225,000
Contingency	122,200
Land and Rights	10,000
Engineering	105,100
Inspection	57,700
Bond Counsel	14,000
Local Counsel	5,000
Preliminary Engineering Report	10,000
Environmental Report	8,000
Geotechnical Report	10,000
Capitalized Interest	15,000
<b>Total Project Cost</b>	<b>\$1,582,000</b>

## **5.0 SELECTION OF AN ALTERNATIVE**

### **5.1 Life Cycle Cost Analysis**

Tables 3 and 4 on the following pages 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 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 2019 O&M values by 5 percent per year for 3 years due to inflation. The same formula was used for the maintenance category with a slight change. For both alternatives, the utilities were reduced by 20 percent in 2022 due to the full project completion. For Alternative 1, the line upkeep and water purchases stayed at the 2021 projections due to project completion. Tables 3 and 4 are the expected values for the first year of operation (2022) for Alternative 1 and 2, respectively.

**Table 3: Alternative 1 Life Cycle Cost Analysis**

<b>Capital Expense</b>		\$1,920,000
<b>Annual O&amp;M</b>		
Water Purchases	\$1,068,213	
Salaries	\$251,789	
Employee Benefits	\$308,892	
Taxes	\$23,605	
Office Expense & Postage	\$40,334	
Insurance	\$30,921	
Transportation Expense	\$29,521	
Line Upkeep	\$50,810	
Contract Labor	\$16,732	
Utilities & Telephone	\$84,310	
Legal & Professional	\$37,015	
Miscellaneous	\$28,475	
Regulatory Commission Expenses	\$3,320	
Total O & M Cost	<u>\$1,973,937</u>	
USPW Factor	x 18.99	
Present Worth; Annual O&M		\$37,485,064
<b>Salvage Value</b>		
Existing Facilities	\$8,893,993	
Proposed Improvements	<u>894,000</u>	
Total Salvage Value	\$9,787,993	
SPPW Factor	x 0.91	
Present Worth; Salvage		\$8,907,074
<b>Net Present Value:</b>		<b>\$30,497,990</b>

**Table 4: Alternative 2 Life Cycle Cost Analysis**

<b>Capital Expense</b>		\$1,582,000
<b>Annual O&amp;M</b>		
Water Purchases	\$1,125,853	
Salaries	\$251,789	
Employee Benefits	\$308,892	
Taxes	\$23,605	
Office Expense & Postage	\$40,334	
Insurance	\$30,921	
Transportation Expense	\$29,521	
Line Upkeep	\$64,989	
Contract Labor	\$16,732	
Utilities & Telephone	\$84,310	
Legal & Professional	\$37,015	
Miscellaneous	\$28,475	
Regulatory Commission Expenses	\$3,320	
Total O & M Cost	<u>\$2,045,756</u>	
USPW Factor	x 18.99	
Present Worth; Annual O&M		\$38,848,906
<b>Salvage Value</b>		
Existing Facilities	\$8,893,993	
Proposed Improvements	<u>735,000</u>	
Total Salvage Value	\$9,628,993	
SPPW Factor	x 0.91	
Present Worth; Salvage		\$8,762,384
<b>Net Present Value:</b>		<b>\$31,668,523</b>

## Notes and Equations Used in Life Cycle Cost Analysis:

*Interest Rate (i) = 0.5%*

*Planning Period (n) = 20 years*

*Estimated Maintenance for Alternative 1 = (Existing Maintenance x 1.02<sup>4</sup>) x 0.80*

*Estimated Maintenance for Alternative 2 = Existing Maintenance x 1.02<sup>4</sup>*

*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.*

*Net Present Value = Capital + (USPW \* Total O&M) – (SPPW \* Total Salvage Value)*

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

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

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

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

## 5.2 Non-Monetary Factors

There were 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.

## 6.0 PROPOSED PROJECT

### 6.1 Preliminary Project Design

It is upon recommendation of the project engineer that Alternative 1 (water storage tank and pump station replacement) 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:

**6.1.1 Project Layout:** This project will consist of upgrading the Shugars Hill Pump Station, replacing the Walnut Hill and Henson Creek Hydro-Pneumatic Pump Station with a new above ground pump stations, constructing a 200,000 gallon elevated tank, repainting the existing Nubbin Tank and adding a mixing system, 1,000 Hersey Hot Rod AMRs, six telemetry units, and five 8" insert valves. If funds remain at the completion of the project, the existing underground Crossroads Pump Station will be replaced with a new above ground pump station. The four pump stations have performed well over the years but have reached the end of their usable lives due to increased demands in these areas of the system. All upgraded pump stations will be equipped with telemetry communications to allow for the District to save on operational costs of these pump stations. With these new and upgraded stations, East Casey County Water District will now be able to reliably and efficiently provide water across the system for the foreseeable future without issue.

## 6.2 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.

<b>Task</b>	<b>Estimated Date</b>
Environmental Review Submittal	October 1, 2020
Bid Opening	March 1, 2020
Construction Start	July 1, 2020
Construction Completion	December 1, 2020

## 6.3 Permit Requirements

Table 6 shown on the following page 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.

<b>Agency</b>	<b>Permit or Approval</b>
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

## 6.4 Total Project Cost Estimate

Table 7 shown below is a summarized version of the Engineer's Opinion of Probable Cost for the recommended alternative as described above. A detailed Opinion of Probable Cost is included in the Appendix as Figure 6.

<b>Category</b>	<b>Cost</b>
Construction	\$1,490,000
Contingency	151,000
Land and Rights	10,000
Engineering	133,800
Inspection	67,100
Bond Counsel	14,700
Local Counsel	5,400
Preliminary Engineering Report	10,000
Environmental Report	8,000
Geotechnical Report	10,000
Capitalized Interest	20,000
<b>Total Project Cost</b>	<b>\$1,920,000</b>



## 6.5 Excess Funding Disbursement

Any remaining funds leftover after the project has been substantially completed will be used to fund any or all of the following items as needed or deemed most appropriate by the East Casey County Water District: replacement of the existing underground Crossroads Pump Station with a new above ground pump station, additional AMR water meters. A site map of the additive pump station replacement is attached in Figure 4 in the Appendix.

## 6.6 Annual Operating Budget

Table 8 shown on the following page is a summarized version of the Existing Operating Budget for Year Ending 2019 and proposed operation and maintenance costs upon project completion. The full Existing Operating Budget for Year Ending 2019 is included in the Appendix as Figure 3.

<b>Table 8: Annual Operation &amp; Maintenance Cost</b>		
<b>Category</b>	<b>Existing</b>	<b>Proposed</b>
Water Purchases	\$961,635	\$1,068,213
Salaries	\$253,713	\$251,789
Employee Benefits	\$240,725	\$308,892
Taxes	\$22,554	\$23,605
Office Expense & Postage	\$40,325	\$40,334
Insurance	\$30,987	\$30,921
Transportation Expense	\$27,246	\$29,521
Line Upkeep	\$60,659	\$50,810
Contract Labor	\$26,498	\$16,732
Utilities & Telephone	\$102,691	\$84,310
Legal & Professional	\$28,104	\$37,015
Miscellaneous	\$24,272	\$28,475
Regulatory Commission Expenses	\$3,344	\$3,320
<b>Total Operation &amp; Maintenance Cost</b>	<b>\$1,822,753</b>	<b>\$1,973,937</b>

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

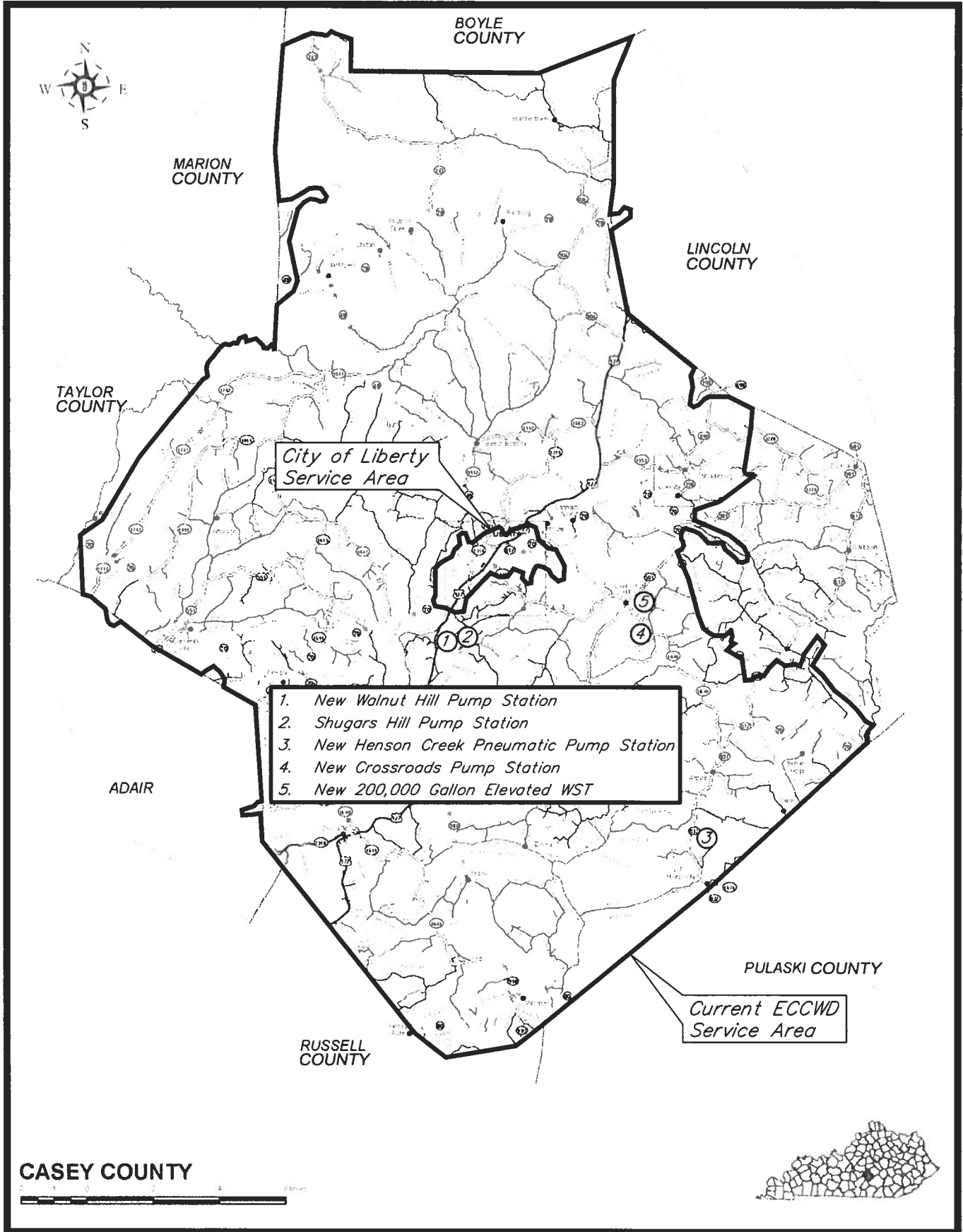
It is the conclusion and recommendation of this report that the East Casey County Water District implement the project as described in the Proposed Project section of this report. It is further recommended that ECCWD proceed with its applications for project funding assistance.

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 4.03% 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



N:\P\2018132\Misc\County Map-Service Area.dwg, 8/21/2020 3:11:16 PM, PTH

CASEY COUNTY

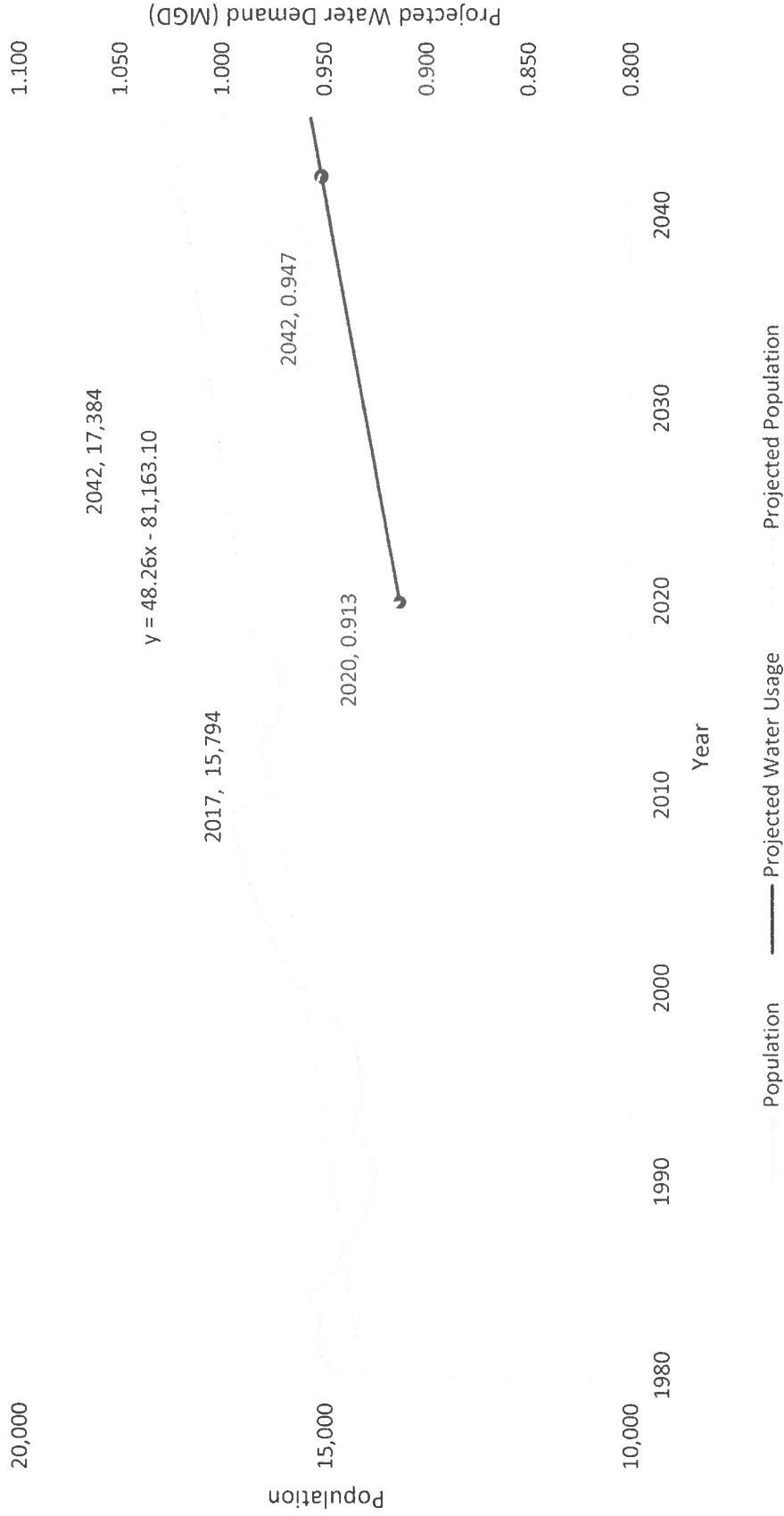


**KENVIRONS, INC.**  
FRANKFORT, KENTUCKY

**FIGURE 1**  
**EAST CASEY COUNTY WATER DISTRICT**  
**LOCATION MAP**

## FIGURE 2

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



## FIGURE 3



**EAST CASEY COUNTY WATER DISTRICT**  
**Existing Operating Budget**  
**For Year Ending 2019**

**REVENUE REQUIREMENTS**

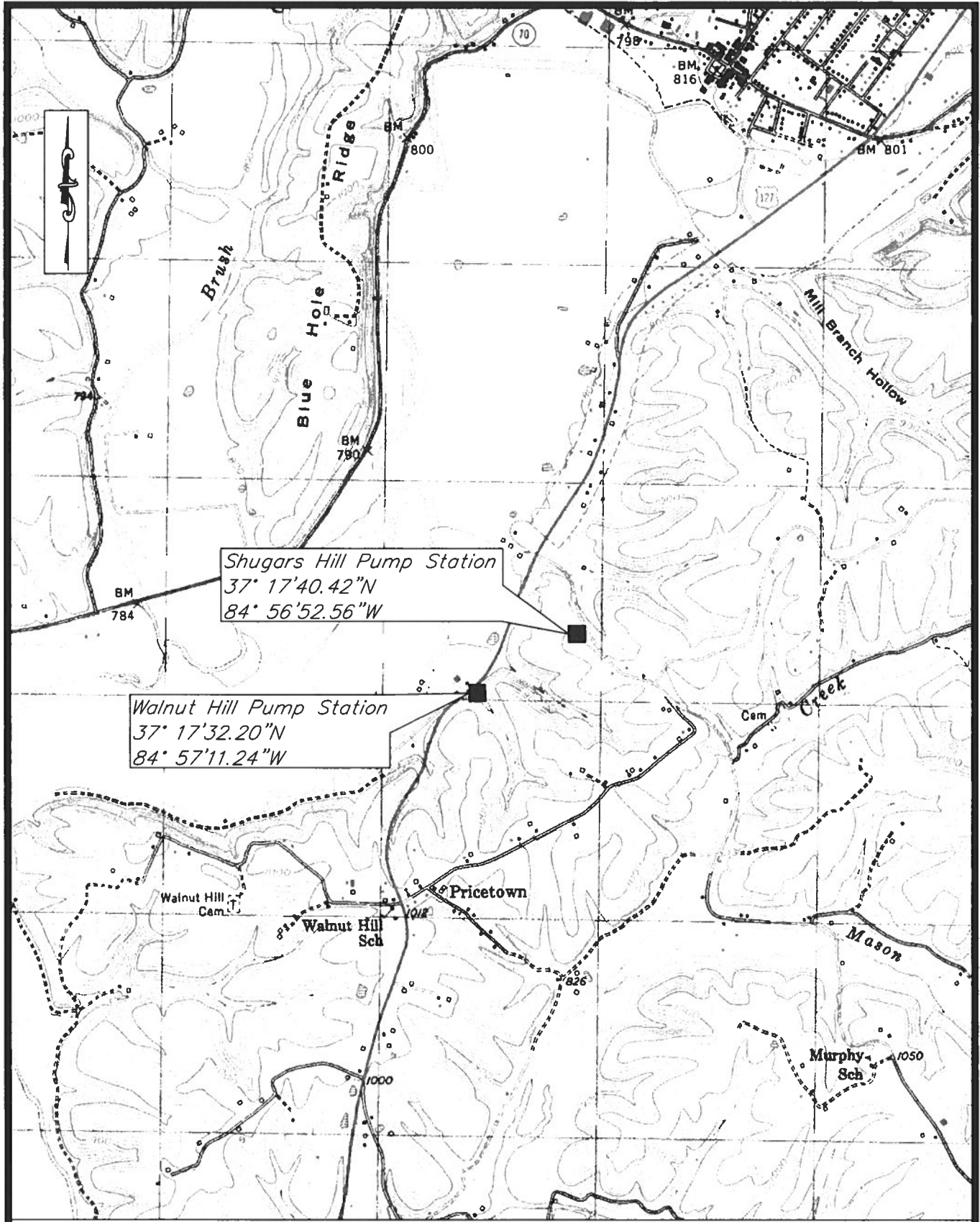
Operation & Maintenance Expenses			
Water Purchases	\$	961,635.00	
Salaries	\$	253,713.00	
Employee Benefits	\$	240,725.00	
Taxes	\$	22,554.00	
Office Expense & Postage	\$	40,325.00	
Insurance	\$	30,987.00	
Transportation Expense	\$	27,246.00	
Line Upkeep	\$	60,659.00	
Contract Labor	\$	26,498.00	
Utilities & Telephone	\$	102,691.00	
Legal & Professional	\$	28,104.00	
Miscellaneous	\$	24,272.00	
Regulatory Commission Expenses	\$	3,344.00	
			<u>\$ 1,822,753.00</u>
Debt Service			
Annual Principal & Interest	\$	253,816.00	
			\$ 253,816.00
Debt Service Coverage, Reserve, & Service Fees			
RD	\$	8,898.00	
			\$ 8,898.00
Other			
Short-Term Assets	\$	-	
			\$ -
<b>TOTAL REVENUE REQUIREMENTS</b>			<u><b>\$ 2,085,467.00</b></u>

**UTILITY INCOME**

Operating Revenues			
Water Sales	\$	1,746,231.00	
Late Charges	\$	46,200.00	
Other Revenue	\$	26,155.00	
			<u>\$ 1,818,586.00</u>
Non-Operating Revenues (Expenses)			
Interest Income	\$	21,520.00	
Gain on Sale of Fixed Asset	\$	-	
Tap Fees	\$	39,890.00	
Other	\$	8,662.00	
			<u>\$ 70,072.00</u>
<b>TOTAL UTILITY INCOME</b>			<u><b>\$ 1,888,658.00</b></u>

## FIGURE 4

N:\P\2018132\Misc\Walnut Hill PS Topo.dwg, 9/1/2020 4:47:38 PM, DWG To PDF.pc3



**LIBERTY, KY QUADRANGLE**

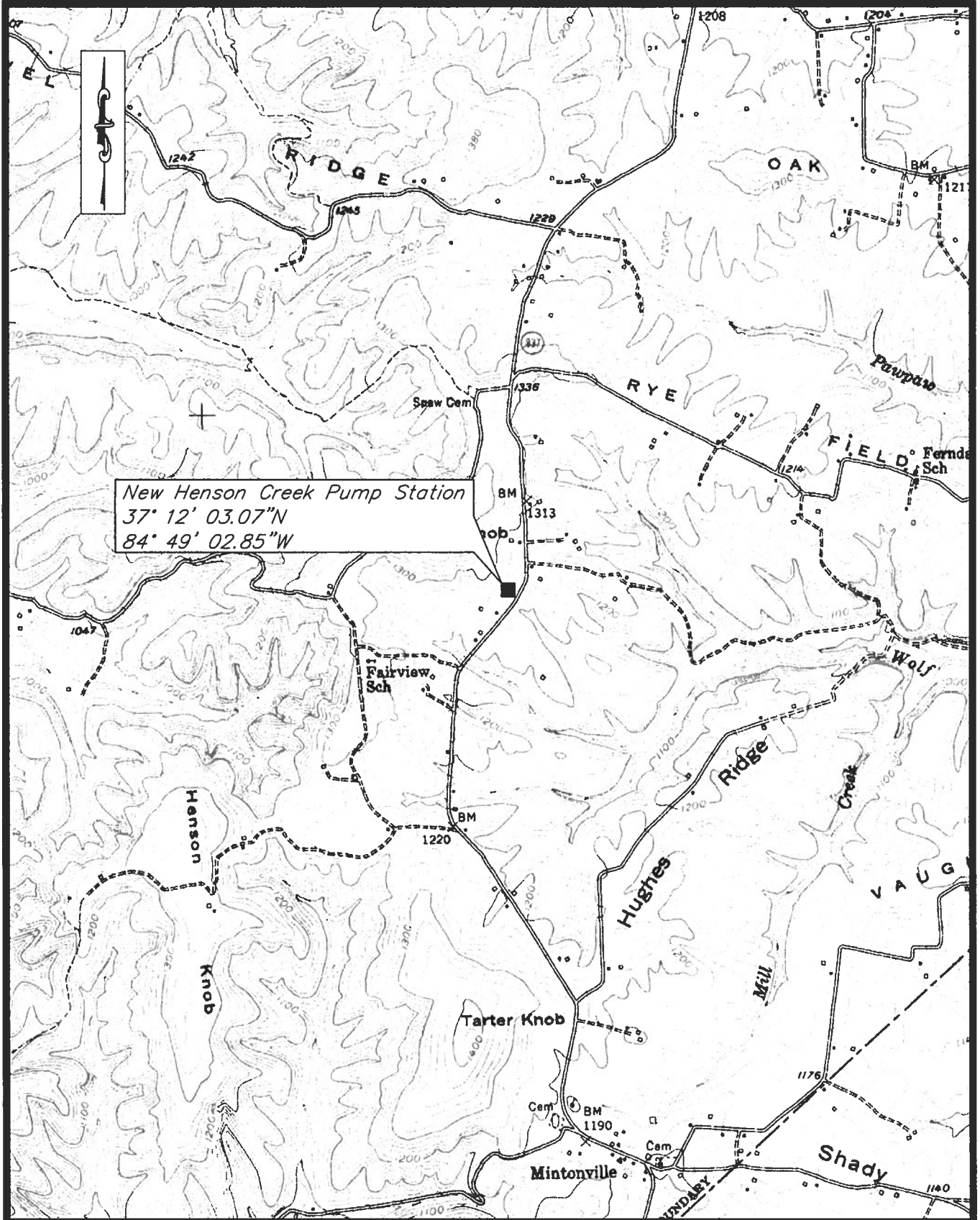


**KENVIRONS, INC.**  
FRANKFORT, KENTUCKY

Project: 2018132  
Checked By: BRW  
Date: 8/17/2020  
Scale: 1"=2,000'

**EAST CASEY COUNTY WATER DISTRICT**  
**2020 WATER SYSTEM IMPROVEMENTS**  
**CASEY COUNTY, KENTUCKY**

N:\P\2018132\Misc\Henson Creek PS Topo.dwg, 9/1/2020 4:48:59 PM, DWG To PDF.pc3



New Henson Creek Pump Station  
 37° 12' 03.07"N  
 84° 49' 02.85"W

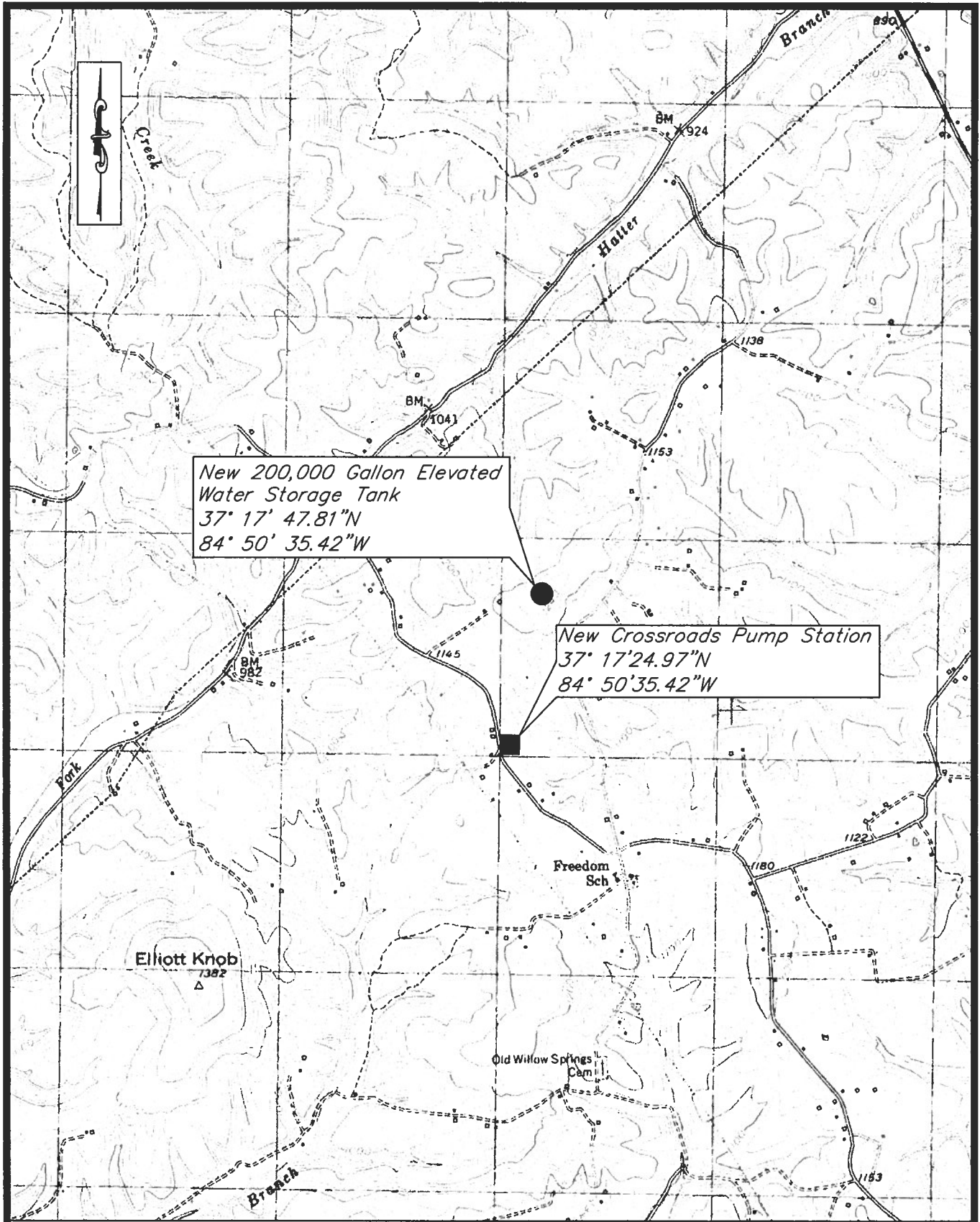
MINTONVILLE, KY QUADRANGLE



**KENVIRONS**  
 Civil & Environmental Engineers

Project: 2018132  
 Checked By: BRW  
 Date: 8/17/2020  
 Scale: 1"=2,000'

**EAST CASEY COUNTY WATER DISTRICT  
 2020 WATER SYSTEM IMPROVEMENTS  
 CASEY COUNTY, KENTUCKY**



New 200,000 Gallon Elevated  
Water Storage Tank  
37° 17' 47.81"N  
84° 50' 35.42"W

New Crossroads Pump Station  
37° 17' 24.97"N  
84° 50' 35.42"W

YOSEMITE, KY QUADRANGLE



**KENVIRONS, INC.**  
FRANKFORT, KENTUCKY

Project: 2018132  
Checked By: BRW  
Date: 8/18/2020  
Scale: 1"=2,000'

**EAST CASEY COUNTY WATER DISTRICT**  
**2020 WATER SYSTEM IMPROVEMENTS**  
**CASEY COUNTY, KENTUCKY**

## FIGURE 5

# East Casey County Water District

## Alternative #1 (Water System Improvements)

### Opinion of Probable Cost

September 1, 2020

Item No.	Item Description	Unit	Quantity	Unit Price	Item Price
1	Shugars Hill Pump Station Upgrade	LS	1	\$85,000.00	\$85,000.00
2	Walnut Hill Pump Station	LS	1	170,000.00	170,000.00
3	Henson Creek Hydro Pneumatic Pump Station	LS	1	130,000.00	130,000.00
4	Repaint Existing Nubbin Tank/w Mixing System	LS	1	220,000.00	220,000.00
5	200,000 Gallon Elevated Tank	LS	1	600,000.00	600,000.00
6	Hersey Hot Rod AMR	EA	1,000	190.00	190,000.00
7	Telemetry Units	EA	6	7,500.00	45,000.00
8	8" Insert Valve	EA	5	10,000.00	50,000.00
<b>Total Construction Cost</b>					<b>\$1,490,000.00</b>

Construction Cost	\$1,490,000.00
Contingency	151,000.00
Engineering Design	133,800.00
Resident Inspection	67,100.00
Environmental	8,000.00
Preliminary Engineering Report	10,000.00
Geotechnical Report	10,000.00
Local Counsel	5,400.00
Bond Counsel	14,700.00
Land & Rights	10,000.00
Capitalized Interest	20,000.00
<b>TOTAL PROJECT COST</b>	<b>1,920,000.00</b>

## Estimated User Rate Impact

### FUNDING:

RD Loan (75%)	\$1,440,000.00
RD Grant (25%)	\$480,000.00
<b>TOTAL PROJECT FUNDING</b>	<b>\$1,920,000.00</b>

### REVENUE REQUIREMENT:

RD Annual Principal & Interest Payment	\$48,135
Loan Coverage @ 10%	\$4,814
Depreciation/Short Lived Assets	\$36,000
<b>Total Annual Expense</b>	<b>\$88,949</b>

Number of Existing Customers	5,200
Additional Revenue Per Bill	\$1.43

	Current Rates	Proposed Rates
First 2,000 Gallons	\$24.22	\$25.65
Next 1,500 Gallons	\$7.70	\$7.70
Next 1,500 Gallons	\$6.87	\$6.87
Next 1,500 Gallons	\$5.78	\$5.78
All Over 7,500 Gallons	\$4.57	\$4.57

Cost for 4,000 gallons	\$35.36	\$36.78
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**Percent Increase                      4.03%**

## FIGURE 6



# East Casey County Water District

## Alternative #2 (Reduced Project)

### Opinion of Probable Cost

September 1, 2020

Item No.	Item Description	Unit	Quantity	Unit Price	Item Price
1	Shugars Hill Pump Station Upgrade	LS	1	\$85,000.00	\$85,000.00
2	Walnut Hill Pump Station	LS	1	170,000.00	170,000.00
3	Henson Creek Hydro Pneumatic Pump Station	LS	1	130,000.00	130,000.00
4	200,000 Gallon Elevated Tank	LS	1	600,000.00	600,000.00
5	Hersey Hot Rod AMR	EA	1,000	190.00	190,000.00
6	8" Insert Valve	EA	5	10,000.00	50,000.00
<b>Total Construction Cost</b>					<b>\$1,225,000.00</b>

Construction Cost	\$1,225,000.00
Contingency	122,200.00
Engineering Design	105,100.00
Resident Inspection	57,700.00
Environmental	8,000.00
Preliminary Engineering Report	10,000.00
Geotechnical Report	10,000.00
Local Counsel	5,000.00
Bond Counsel	14,000.00
Land & Rights	10,000.00
Capitalized Interest	15,000.00
<b>TOTAL PROJECT COST</b>	<b>1,582,000.00</b>

## Estimated User Rate Impact

### FUNDING:

RD Loan (75%)	\$1,187,000.00
RD Grant (25%)	\$396,000.00
<b>TOTAL PROJECT FUNDING</b>	<b>\$1,583,000.00</b>

### REVENUE REQUIREMENT:

RD Annual Principal & Interest Payment	\$39,678
Loan Coverage @ 10%	\$3,968
Depreciation/Short Lived Assets	\$29,675
<b>Total Annual Expense</b>	<b>\$73,321</b>

Number of Existing Customers	5,200
Additional Revenue Per Bill	\$1.18

	Current Rates	Proposed Rates
First 2,000 Gallons	\$24.22	\$25.40
Next 1,500 Gallons	\$7.70	\$7.70
Next 1,500 Gallons	\$6.87	\$6.87
Next 1,500 Gallons	\$5.78	\$5.78
All Over 7,500 Gallons	\$4.57	\$4.57
 Cost for 4,000 gallons	 \$35.36	 \$36.53

**Percent Increase                      3.32%**