

2021 WATER SYSTEM IMPROVEMENTS

WATER MAIN AND PUMP STATIONS

PRELIMINARY ENGINEERING REPORT

FOR

ROWAN WATER, INC.

March, 2021



222 East Main Street, Ste. 1 • Georgetown, KY 40324

SECTION 1 PROJECT PLANNING

1.01 LOCATION

Rowan Water, Inc. (RWI) is a water association that serves all of Rowan County, outside the city limits of Morehead, the northern portion of Elliott County, the western tip of Carter County, the northern edge of Morgan County and the southern portion of Fleming County.

This project is mostly defined with the replacement and relocation of the existing 4" water main at the intersection of KY 1274 and KY 519 due to the severe slippage of the existing ground. Other items include the installation of a new pump station on KY 32 in order to provide larger volumes of water to the suction side of the existing KY 32 pump station. Increased growth in this area has strained the volume/pressures on the suction side of the station. Also included, is a new pump station to replace the existing aged US 60 pump station and to relocate it in a more favorable location for RWI to access. New VFD's will be installed in the existing KY 32 station for smoother and more efficient operation. Topographic maps are attached to this Preliminary Engineering Report as **Appendix A**.

1.02 ENVIRONMENTAL RESOURCES PRESENT

The major environmental features within the proposed area feature a minimum number of landforms and topographic changes as most of the areas are mountainous with flat areas along the streams in the individual hollows. Several of the hollows are in floodplains due to the numerous creeks located in the valleys. An environmental review will be required of the project.

1.03 POPULATION TRENDS

The 2010 population for Rowan County was 23,333. The Kentucky State Data Center projects the County population to grow continuously over the next thirty years. By 2040 the population is estimated to be 28,982. The projections from the Kentucky State Data Center for the next twenty years are:

2020	2025	2030	2035	2040
24,879	25,809	26,953	28,023	28,982

In 1987 RWI had a customer base of approximately 2,022 customers. The customers have grown to approximately 7300 today. The majority of the customers are residential with the balance being commercial customers. Rowan Water has two wholesale customers, Fleming County Water Association and the City of Olive Hill.



1.04 COMMUNITY ENGAGEMENT

Rowan Water, Inc. monthly board meetings are open to the public for open dialogue with the community. This project will also have an advertised public meeting that will encourage participation by the community for feedback on the project. This public meeting will be able to address concerns, funding and revenue strategies, and to address the needs of the project for public benefit.

SECTION 2 EXISTING FACILITIES

2.01 LOCATION

Rowan Water, Inc. is located in eastern Kentucky with the county seat being the City of Morehead. A system map of the project showing the extent of the 2021 Water System Improvements is located at the end of this report (**Appendix A**).

2.02 HISTORY

RWI was established in 1968. Major expansions and renovations of its system were done in 1991, 1992, 1998, 2001, 2004, 2007, 2012, 2016, and 2018. RWI purchases one hundred percent of its water from the Morehead Utility Plant Board. All expansions and renovations were on its distribution system, including storage tanks and radio read meters.

2.03 CONDITION OF EXISTING FACILITIES

The existing system is in relatively good shape. More recently Rowan Water, Inc. replaced an aging standpipe tank on 3-C Trail with a new 150,000-gallon elevated tank. Rehabilitation work was also completed on the following tanks: Sawmill, Rock Fork, Pond Lick, Frank Johnson and Maxey Flats. A new pump station replaced an aging facility on 3-C Trail as well as updates to the Old Hilda and Sawmill pump stations. Therefore, most all of the water storage facilities and pump stations have been updated except for the US 60 and KY 32 stations. Most recently in 2020, RWI completed the 100 percent replacement of all their manual read meters with new radio read meters.

The pipe in the distribution system is in fairly good order as RWI reports a water loss of between 25 and 30 percent. This despite over 600 miles of water main in five counties serving more than 7,300 customers. Most of this pipe is in a mountainous and rocky terrain.

2.04 FINANCIAL STATUS OF ANY EXISTING FACILITIES

RWI submits an annual audit and PSC report to Rural Development and the Kentucky Public Service Commission.

Information regarding current rate structure, O&M cost, and user data will be compiled in the Summary Addendum to the PER.

2.05 WATER/ENERGY AUDITS

RWI has not had a water energy audit completed, but the recently built new pump station on 3-C Trail and the addition of Variable Frequency Drives to the existing Old Hilda and Sawmill pump stations and soon to be US 60 and KY 32 stations will continue to provide energy cost savings by the way the VFD's ramp up and down with the demand for service. The installation of drive-by meters has reduced the gasoline consumption and the wear and tear on all of the meter reading vehicles significantly.

SECTION 3 NEED FOR PROJECT

3.01 HEALTH, SANITATION, AND SECURITY

The need for this project is to address some pertinent concerns within the system that need to be addressed in short order. The 6000 LF water main relocation at the intersection of KY 1274 and KY 519 is a high priority as the hillside where the water main goes across country has been slipping for a few years, and all efforts to keep the line in service have been temporary in nature. The only solution to this problem is to relocate the water main around the slip. This will help to reduce the outages, and boil water advisories to this area of customers. The US 60 pump station replacement is needed as this pump station is aged and needs extensive rehabilitation. Since this station is located behind an existing house, it has been determined to move this station to a better location with more practical accessibility. The addition of a new pump station on KY 32 is to provide a greater volume of water to this area. The continued growth of customers in the Elliottville and 3-C Trail area has challenged RWI to keep the pressures above the minimum on the suction side of the KY 32 (Christy Creek) pump station. The addition of new VFD's to the existing KY 32 station will allow the station to run smoother as demands change and will be more energy efficient.

The proposed project will help to improve the overall service from a water quality and reliability standpoint to the Rowan Water, Inc. customers.

3.02 AGING INFRASTRUCTURE

With the exception of the KY 32 and US 60 pump stations, most all of the pump stations have been rehabilitated or updated in the last several years and the distribution system serves all of the customers in the county that are remotely feasible. The following tanks were rehabilitated in the 2016 project: Johnson, Maxey Flats, Rock Fork, Pond Lick, and Sawmill. The 3-C standpipe tank was replaced with a larger 150,000-gallon elevated tank in 2016 as well. The most recent project had RWI replacing all of the aged meters in the system with new radio read meters. The distribution system as a whole is in fairly good order with a few exceptions that will be taken care of with this new project.

3.03 REASONABLE GROWTH

Rowan Water has seen an approximate 260 percent growth in customers over the past 30 years. In the year 2020, Rowan Water, Inc. set over 140 new water meters, which is the most they had set in the past several years. With the population projected to continue to increase over the next 20 years, it is reasonable to expect that Rowan

Water's customer base will continue to increase and capital improvements to the system must be updated.



SECTION 4 ALTERNATIVES CONSIDERED

4.01 Description

Alternatives considered included using directional drill in the same location of the slip at the intersection of KY 1274 and KY 519 and attempt to get below the slippage. This would have entailed a geotechnical investigation and it was felt that due to the large trees that are toppling that this could be a dangerous proposition. It was determined the directional drill would be a riskier proposition, therefore the determination was made to relocate around the slip and install the new water main on the state right of way. The low-pressure issue on the suction side of the KY 32 pump station could have been addressed by enlarging the water main on KY 32 from a 8" water main to a 12" water main back to the master meter provided by the City of Morehead, but this would not be cost efficient.

4.02 Design Criteria

The design criteria that will be used on the project include hydraulic analysis of the existing system to determine that adequate pressures, and water loss are realized and analyzed throughout the distribution system along with examining flushing velocities. By properly sizing the distribution mains to be installed, RWI will provide improved service to its customer base while also maintaining potable water of high quality.

4.03 Map

Topo maps of the project, showing the water main relocation/replacement on KY 1274, KY 32 water main upgrade, location of the new US 60 booster pump station is located at the end of this report (**Appendix B**).

4.04 Environmental Impacts

An environmental report detailing the potential impacts of the project may be undertaken with this project. Once the report is finalized any potential impacts will be taken into consideration and any necessary remediation measures will be taken to avoid any negative impact to the environment.

4.05 Land Requirements

Land requirements associated with this project will include the need for easements and encroachment permits, both public and private, for the installation of the replacement water mains. In some areas the existing easements may be utilized. Those easements

and permits will be obtained prior to any construction beginning. The new US 60 pump station will be installed on new purchased property with the new 32 pump station located on property currently owned by Rowan Water, Inc.

4.06 Potential Construction Problems

Potential problems can occur anytime the replacement of existing water mains is undertaken. Working closely to existing water lines could cause some unexpected outages if RWI does not have command of where the existing line is located. These problems are considered during the design of the project and all precautions are taken to limit this potential risk.

4.07 Cost Estimates

A preliminary project cost estimate is included at the end of this report (**Appendix C**).

SECTION 5 SELECTION OF AN ALTERNATIVE

5.01 Life Cycle Cost Analysis

In the selection of the preferred alternative for this project the life cycle cost of the materials to be utilized has been considered. The main material to be utilized is the water main. The water main will be of PVC material and the reconnected service line will be HDPE class 250 material. Recent studies estimate a service life of both the HDPE and the PVC up to one hundred years. In addition, the new pump station and the existing KY 32 pump station will utilize Variable Frequency Drives which should reduce electrical costs as much as thirty percent and also provide flexibility to the system if the storage tanks to which they pump, need to be removed from service for any reason. This length of service life and VFD's provides for lower operating and maintenance costs to be realized by RWI.

5.02 Non-Monetary Factors

The non-monetary factors considered are the ability to provide reliable service to the existing customer base. With the replacement water mains, the existing customer base will have improved service and a higher quality product due to the elimination of problematic water lines. The new pump station is desperately needed in this project to provide consistency and reliability to the entirety of the water distribution system.

SECTION 6 PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

6.01 Preliminary Project Design

The proposed project consists of a wide variety of capital improvements that will enhance the operation of Rowan Water, Inc. in the years to come. Approximately 6000 LF of new 4" PVC water main that will replace the problematic water main that is currently in a slip area. The new water main will be installed around the slip area so that this will no longer be a concern for RWI. Also included will be a new pump station that will be located at the Rowan Water office site that shall provide much needed volume to the Elliottville and 3-C area via the KY 32 (Christy Creek) pump station. This area has seen increased new services over the years and is now starting to expose lower pressure issues on the suction side of the station. The KY 32 station will also be updated with new Variable Frequency Drives (VFD's) to provide a more efficient mode of running these pumps and can be interacted to run at specific times. This will save RWI on the power costs to operate the pumps. In addition, this project will include the replacement of the US 60 pump station. The current station is aged and needs updating. Since it is currently located in the backyard of an existing property owner, RWI has chosen to build a new station in a location that is much more feasible for access.

Additionally, should project funds be available the project might include the purchase of general day to day equipment such as a back hoe, portable generator; water line locator with ground penetrating radar, trailer; backup laptop computer; tank inspections, tank maintenance and other miscellaneous tools to maintain the water distribution system in a professional and timely manner.

6.02 Project Schedule

The proposed project schedule is:

1. Secure Letter of Conditions from USDA RD – June, 2021
2. Secure Land/Easement/Encroachment Permits – May, 2021
3. Division of Water Submittal – June, 2021
4. Advertise for Bids – August, 2021
5. Contract Award/Initiate Construction – November, 2021
6. Substantial Completion – May, 2022
7. Final Completion/Initiation of Operation – June, 2022

6.03 Permit Requirements

The project will include the need for Division of Water Approval and other potential permits to be identified within the environmental report.

6.04 Total Project Cost Estimate (Engineer's Opinion of Probable Cost)

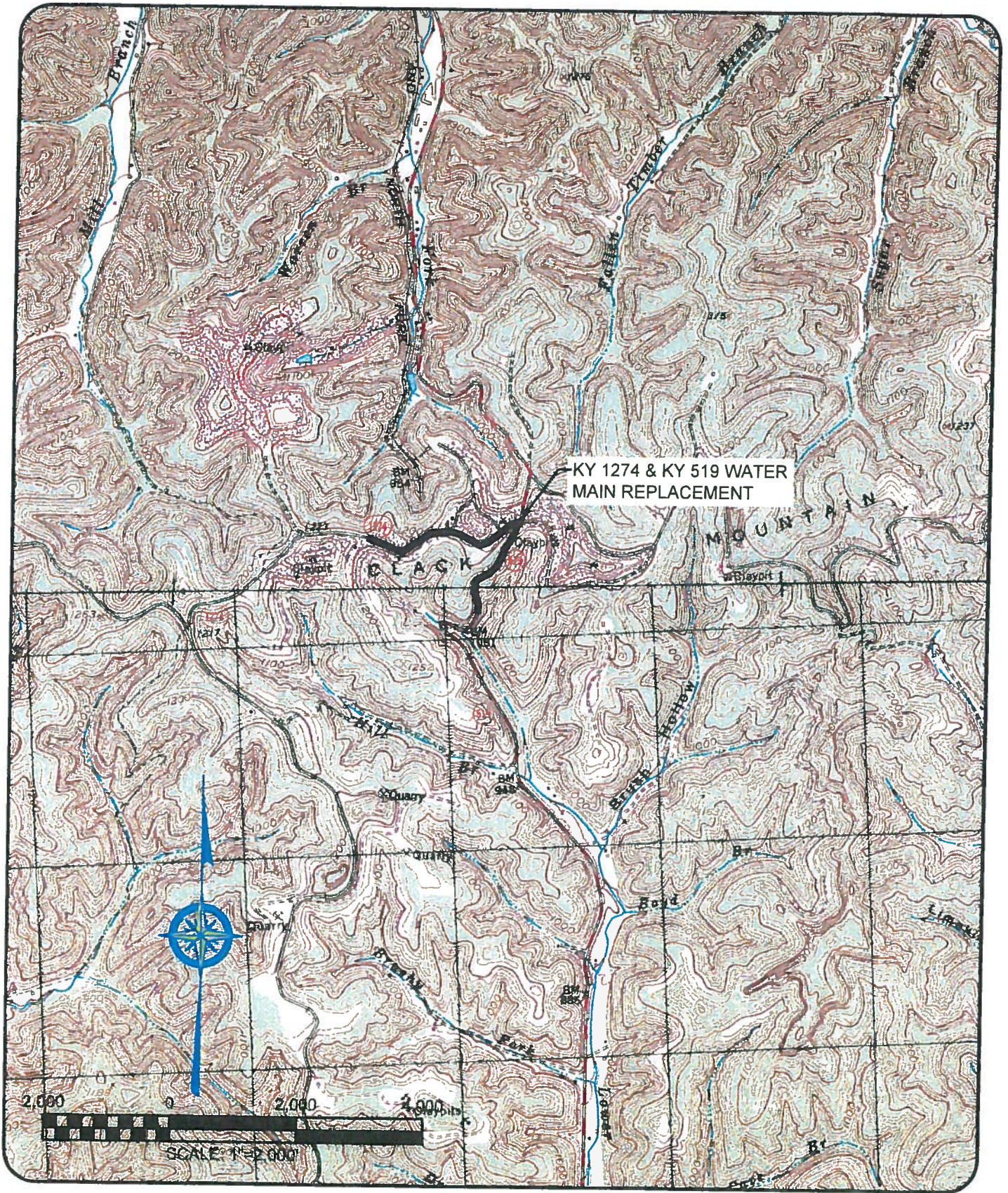
A preliminary project cost estimate is included at the end of this report (**Appendix C**).

6.05 Annual Operating Budget

A Summary Addendum will be prepared for the project which will examine Rowan Water's current and future financial position. Included within the Summary Addendum will be an analysis of RWI's current income, annual O & M costs, current and future debt repayments and current reserves. This Summary Addendum will propose a suggested rate for RWI in order to meet its current and future debt obligations.

APPENDIX A PROJECT TOPO MAPS





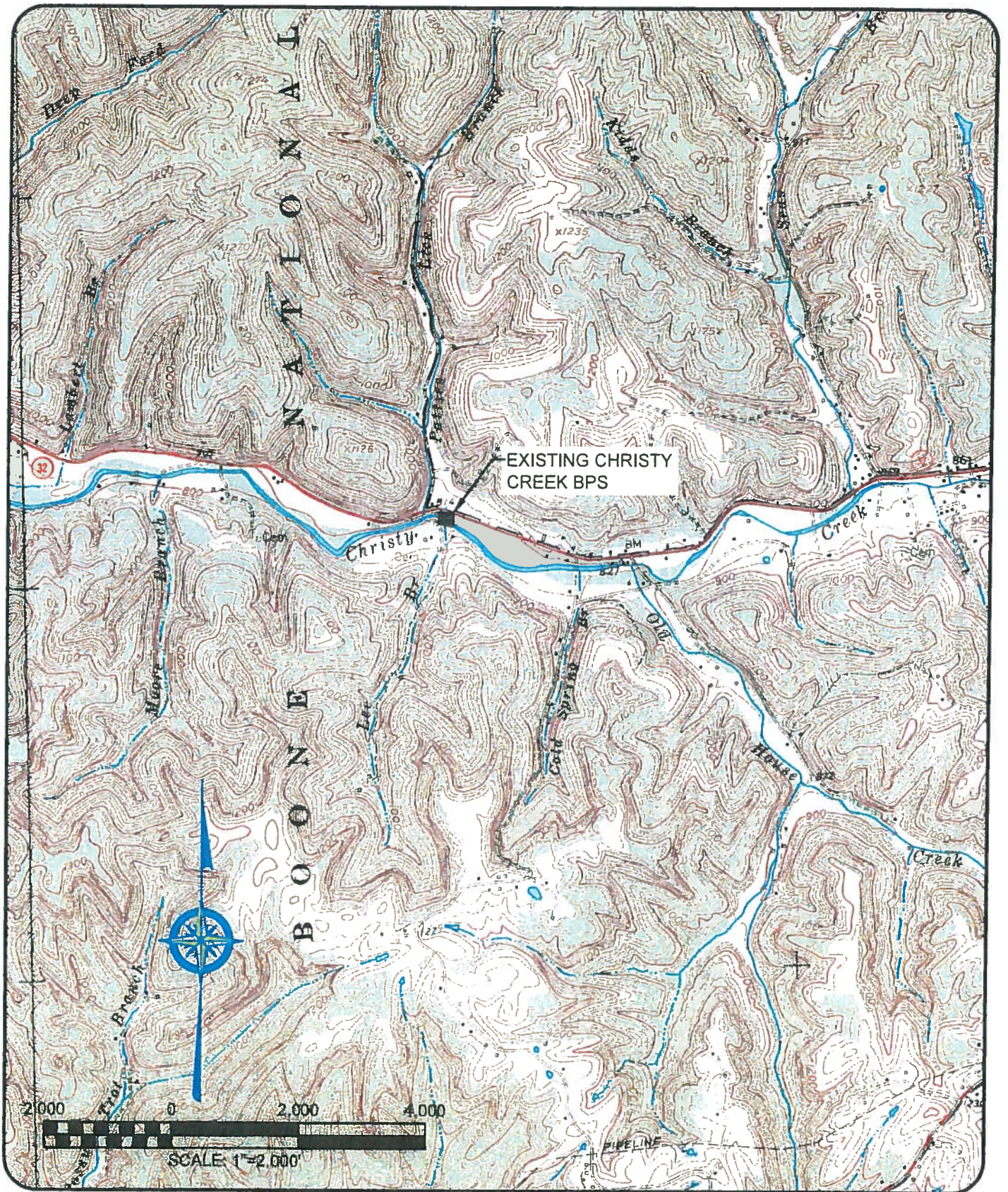
222 East Main Street Ste. 1 • Georgetown KY 40324

2021 WATER SYSTEM
IMPROVEMENTS
FOR
ROWAN WATER, INC.

Project No.
20020

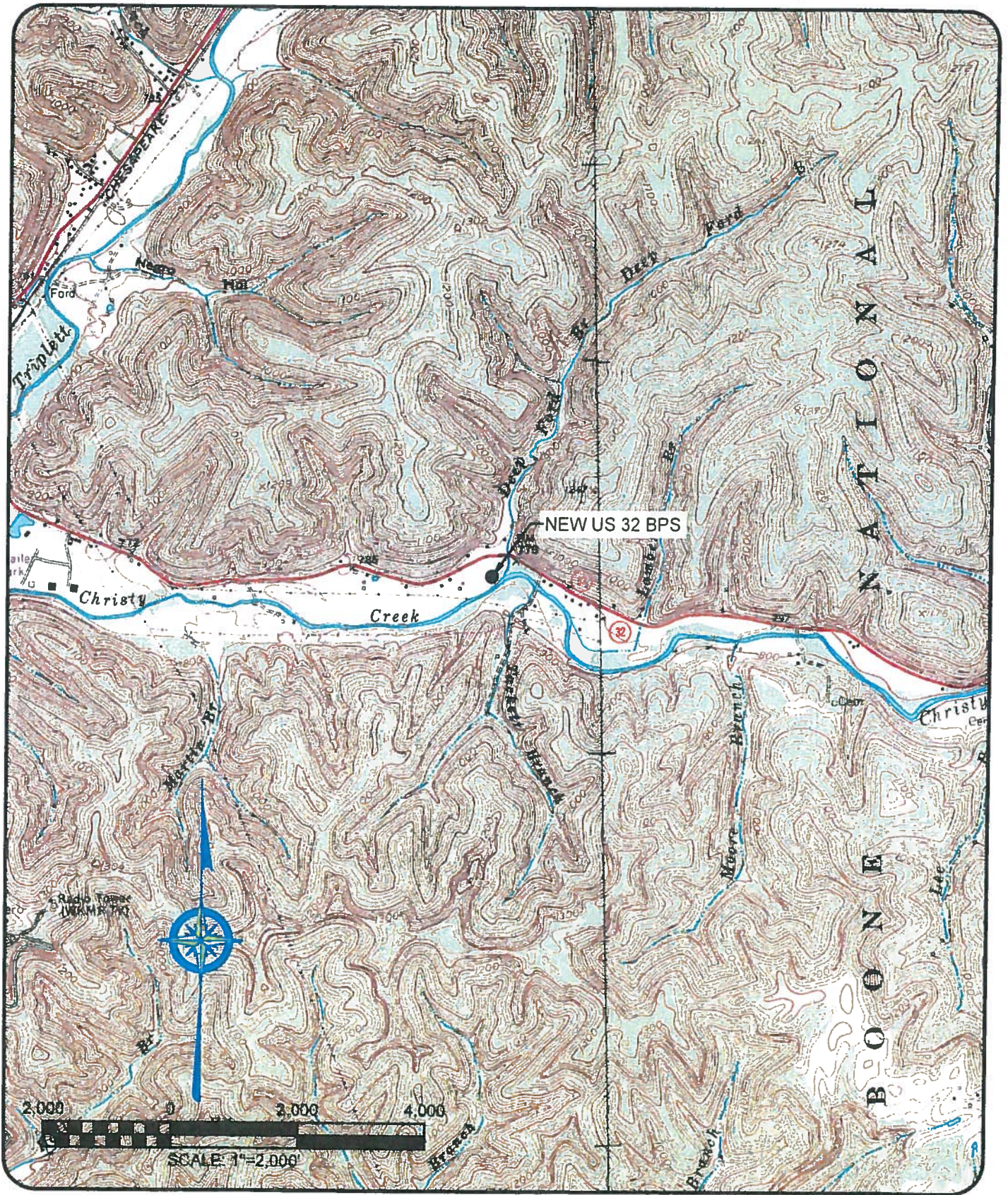
Date
01/2021

Dwg. No.
1



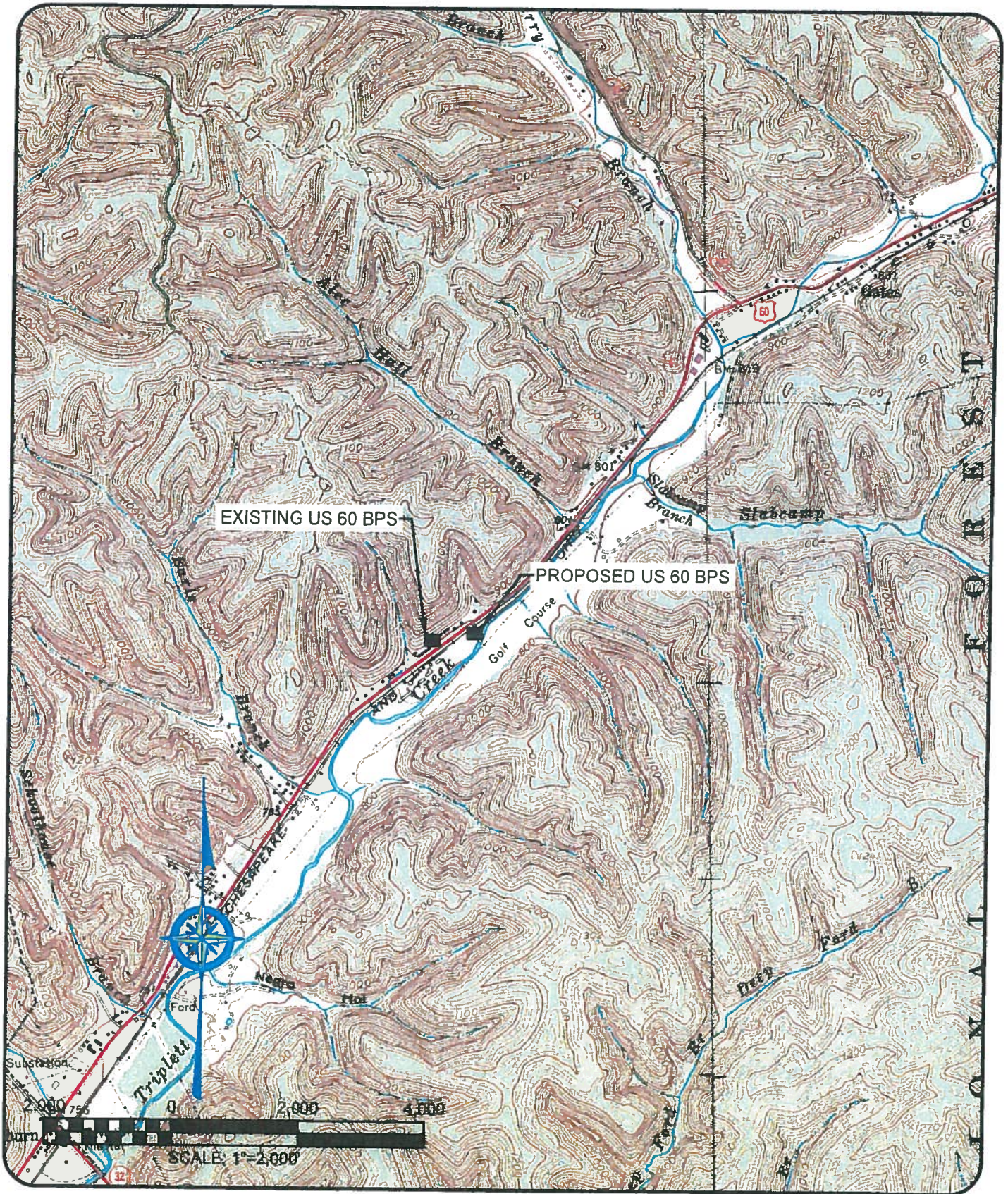
2021 WATER SYSTEM
 IMPROVEMENTS
 FOR
 ROWAN WATER, INC.

Project No. 20020
Date 01/2021
Dwg. No. 4



2021 WATER SYSTEM
IMPROVEMENTS
FOR
ROWAN WATER, INC.

Project No. 20020
Date 01/2021
Dwg. No. 3



2021 WATER SYSTEM
 IMPROVEMENTS
 FOR
 ROWAN WATER, INC.

Project No. 20020
Date 01/2021
Dwg. No. 2

APPENDIX B SYSTEM WIDE MAP



APPENDIX C PRELIMINARY PROJECT COST ESTIMATE



