

GARRARD COUNTY WATER ASSOCIATION

2020 WATER SYSTEM IMPROVEMENTS

PRELIMINARY ENGINEERING REPORT

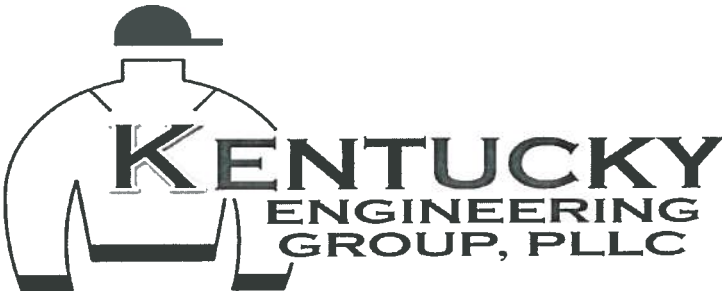


GARRARD COUNTY WATER ASSOCIATION

315 Lexington Road

Lancaster, KY 40444

August 2020



GARRARD COUNTY WATER ASSOCIATION PRELIMINARY ENGINEERING REPORT 2020 WATER SYSTEM IMPROVEMENTS

I. GENERAL

The Garrard County Water Association (GCWA) was formed in the late 1960's. The existing system consists of approximately 400 miles of water lines with 6 functioning water storage tanks and 6 booster pump stations that serve approximately 5,533 customers in Garrard County.

II. PROJECT PLANNING AREA

A. Location

The GCWA is located in Central Kentucky in Garrard County. With the exception of the City of Lancaster, the GCWA serves the majority of Garrard County along with a few customers in Lincoln, Madison and Rockcastle Counties. A map of the GCWA's service area is located at the end of this report.

The topography of Garrard County is a dissected upland with a gently rolling to hilly topography. The topography becomes more rugged near the deep valleys of the Kentucky River, which marks the northern boundary, and the Dix River, which forms the northwestern boundary. A nearly flat, slightly karstic, upland plain occupies part of northwestern Garrard County between U.S. 27 and Herrington Lake. Elsewhere, except locally in the vicinity of Lancaster, flat areas are rare. Local reliefs along the Kentucky River exceed 300 feet. Local reliefs along Herrington Lake are generally between 150 and 200 feet.

B. Environmental Resources

The major environmental features in the area are primarily gently rolling to hilly terrain. The gradual undulating terrain is the reason for a relatively few number of water storage tanks and pump stations. Water pressures range from below 30 psi to over 180 psi in sections of the system. Many of the hollows are in floodplains in particular along the Kentucky and Dix River. No known historic sites are noted in the planning area.

C. Growth Areas and Population Trends

A quick review of the census information shows a fairly significant increase in the population over the next twenty years. Since the establishment of the GCWA the population of Garrard County has continued to grow, in particular the northern

portion of the county. The water system has had rapid growth over the past 20 years because of numerous line extension projects. The population projections for Garrard County are shown below.

	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>
Population	16,912	19,122	20,954	22,255	23,123

III. EXISTING FACILITIES

A. Location Map

A map of the county showing the extent of the water system is located at the end of this report.

B. History

The GCWA system was originally built in the late 1960's. The GCWA purchases the majority of its water from the City of Lancaster. Numerous water line extension projects have been developed over the past 40 years to establish the current GCWA customer base which serves approximately 95% of Garrard County.

C. Condition of Facilities

The GCWA system is in good to fair condition and work continues to improve the older, undersized sections of the GCWA.

Several of the original water mains in the GCWA system are class 160 PVC pipe and/or asbestos cement (AC) which has been a problematic source for line breaks and excessive maintenance industry wide. GCWA has experienced numerous line breaks which results in inadequate service to its customers and increased water loss. Several customers experience underserved water supply/pressure due to the excessive line breaks; in particular the northwestern and northern portion of the system which has experienced the most growth and the southern portion of the system which is some of the oldest sections of the system.

D. Financial Status

Annual audits will be submitted to Rural Development as required by the RD bond issue. A customer breakdown will be provided in the Summary Addendum.

As with the majority of utilities across the country, the GCWA has seen its operating expenses rise over the past several years. Fuel and health insurance are the expenses that have seen the largest increase. Because the GCWA covers a vast geographic area, the fuel cost has had a tremendous impact on cash flow. Also, the

recent COVID-19 pandemic has caused a substantial amount of lost revenue for the GCWA due to customers not paying their bill.

IV. NEED FOR THE PROJECT

A. Health and Safety

The proposed project to upgrade the water mains, extend service to unserved customers and provide one (1) new water tank for adequate storage and improved pressure will help to improve overall water quality. Improving storage capacity and hydraulic pressure by installing a new water storage tank to replace an existing undersized water storage tank will improve service to customers in the southeastern portion of Garrard County. Water turnover/water age by eliminating dead ends by looping some of the existing water lines will improve the quality of water for residents in these particular areas and also provide alternatives for service during emergency outages. Also, replacing existing class 160 and/or AC water mains with new class 200/class 250 water mains will drastically reduce the number of water main breaks in these areas, thus improving service to those customers and reducing water loss.

Some of the families living in the project areas currently rely on hauled water and cisterns for their drinking water. Most cisterns do not provide ample quantity and require the families to purchase water several times a month. This exposes some families to poor quality water and limits the amount of water available to them. Several residents in the various areas covered by this project have petitioned the GCWA for water service.

The proposed project will help to improve the overall service from a water quality and reliability standpoint to the GCWA customers.

B. System O&M

Upgrading water mains and replacing one water storage tank will reduce the amount of operation and maintenance budget required for the GCWA system. It will also improve the GCWA system by looping portions of the system that currently are dead-end lines.

V. ALTERNATIVES CONSIDERED

The only alternative considered for the water main upgrade was to do nothing in which case GCWA would continue to experience excessive maintenance cost to repair the class 160 water lines.

VI. PROPOSED ALTERNATIVE

The proposed project is to upgrade the existing class 160 and/or AC water mains that serve the multiple portions of the GCWA system, replace the existing Gabbard water storage tank and extend water lines to serve new customers.

The KY 152 (US 27 to Buena Vista Church) and KY 52 portions of the project will replace problematic class 160 PVC water line with class 200 or class 250 water line.

The Eastland Acres portion of the project will replace AC water line with new class 200 water line. Research has shown the health risk of exposure to asbestos cement water line.

The US 27 (Mt Hebron to Canoe Creek), Ky 1131 to Nina Ridge Road and Profit Road Extension portions of the project will help to loop the existing GCWA system and eliminate dead end sections of the water lines. The Profit Road Extension will also connect a section of the water system that has experienced periodic low pressure to a higher pressure zone, thus improving service to customers in this area.

The Narrow Gap, Profit Road, Paper Mill Road, Sugar Creek Road, Bell Lane, Starnes Road, Boone Creek and Ham Hill portions of the project will extend water service to approximately 17 new customers.

Lastly, the project will include the addition of a new Gabbard water storage tank that will replace the existing Gabbard tank. The increased tank capacity at a higher elevation will increase hydraulic pressure thus improving service to the customers in this area.

Each of the items listed above will help to improve the overall service from a water quality and reliability standpoint to the GCWA customers.

Hydraulically the project takes advantage of elevations to reduce long-term pumping costs while also improving pressures to underserved areas.

The total project cost is shown on the detailed engineer estimate located at the end of the report. Included as part of the project will be for GCWA to purchase and install approximately 1,000 automatic radio read meters. GCWA has experienced trouble finding personnel to manual read existing meters.

It is expected that the GCWA will institute a rate increase with this project. The proposed rates and additional financial data will be presented in the Summary Addendum to the Preliminary Engineering Report that follows this report.

VII. PROPOSED PROJECT SCHEDULE

The proposed project schedule is:

1. Secure Letter of Conditions from USDA RD – October 2020
2. Secure Land/Easement/Encroachment Permits – January 2021
3. Division of Water Submittal – August 2020
4. Advertise for Bids – February 2021
5. Contract Award/Initiate Construction – April 2021
6. Substantial Completion – December 2021
7. Final Completion/Initiation of Operation – January 2022



Preliminary Project Cost Estimate

Project : **GARRARD COUNTY WATER ASSOCIATION**
 Date : **11/09/18** Job No. :
 Revised : **04/03/20** Est. By: **RCC**

ITEM NO.	SUMMARY OF: 2020 Water System Improvements Base Bid	QUANTITY		COST PER UNIT	TOTAL COST
		NO. OF UNITS	UNIT MEAS.		
GABBARD WATER STORAGE TANK					
1	50,000 Gallon Water Storage Tank	1	LS	\$ 300,000.00	\$ 300,000
2	Misc Site Improvements	1	LS	\$ 50,000.00	\$ 50,000
3	4" Class 200 SDR 21 PVC	5,000	LF	\$ 15.00	\$ 75,000
4	Access Road	1	LS	\$ 20,000.00	\$ 20,000
5	Tank Demolition	1	LS	\$ 20,000.00	\$ 20,000
6	Pump station Demolition	1	LS	\$ 10,000.00	\$ 10,000
Sub Total					\$ 475,000
KY 152 WATER LINE REPLACEMENT (27 to Buena Vista Church)					
1	6" Class 200 SDR 21 PVC	15,500	LF	\$ 18.00	\$ 279,000
2	Creek Crossing	260	LF	\$ 150.00	\$ 39,000
3	Road Bore	100	LF	\$ 150.00	\$ 15,000
4	Reconnect Customer Services	60	EA	\$ 1,000.00	\$ 60,000
5	Connect to Existing Water Line	9	EA	\$ 2,500.00	\$ 22,500
6	Blowoff Hydrant	4	EA	\$ 2,000.00	\$ 8,000
Sub Total					\$ 423,500
EASTLAND ACRES AC WATER LINE REPLACEMENT					
1	8" Class 200 SDR 21 PVC	5,000	LF	\$ 20.00	\$ 100,000
2	Road Bore	40	LF	\$ 150.00	\$ 6,000
3	Reconnect Customer Services	40	EA	\$ 1,000.00	\$ 40,000
4	Connect to Existing Water Line	5	EA	\$ 2,500.00	\$ 12,500
5	Flush Hydrant	3	EA	\$ 4,000.00	\$ 12,000
6	Pavement Replacement	400	LF	\$ 50.00	\$ 20,000
Sub Total					\$ 190,500
NARROW GAP WATER LINE EXTENSION					
1	3" Class 200 SDR 21 PVC	3,400	LF	\$ 15.00	\$ 51,000
2	Customer Services	2	EA	\$ 1,000.00	\$ 2,000
3	Creek Crossing	250	LF	\$ 150.00	\$ 37,500
4	Connect to Existing Water Line	1	EA	\$ 2,500.00	\$ 2,500
5	Blowoff Hydrant	1	EA	\$ 2,000.00	\$ 2,000
Sub Total					\$ 95,000
HARMONS LICK					
1	4" Class 200 SDR 21 PVC	4,000	LF	\$ 15.00	\$ 60,000
2	Customer Services	1	EA	\$ 1,000.00	\$ 1,000
3	Road Bore	100	LF	\$ 150.00	\$ 15,000
4	Connect to Existing Water Line	2	EA	\$ 2,500.00	\$ 5,000
5	Blowoff Hydrant	2	EA	\$ 2,000.00	\$ 4,000

		Sub Total					\$ 85,000
PROFIT ROAD WATER LINE EXTENSION							
1	4" Class 200 SDR 21 PVC	5,600	LF	\$ 15.00			\$ 84,000
2	Customer Services	3	EA	\$ 1,000.00			\$ 3,000
3	Creek Crossing	200	LF	\$ 150.00			\$ 30,000
4	Road Bore	30	LF	\$ 150.00			\$ 4,500
5	Connect to Existing Water Line	2	EA	\$ 2,500.00			\$ 5,000
6	Blowoff Hydrant	1	EA	\$ 2,000.00			\$ 2,000
		Sub Total					\$ 128,500
1131 TO NINA RIDGE WATER LINE EXTENSION							
1	3" Class 200 SDR 21 PVC	3,800	LF	\$ 15.00			\$ 57,000
2	Customer Services	3	EA	\$ 1,000.00			\$ 3,000
3	Creek Crossing	100	LF	\$ 150.00			\$ 15,000
4	Connect to Existing Water Line	2	EA	\$ 2,000.00			\$ 4,000
5	Blowoff Hydrant	2	EA	\$ 2,000.00			\$ 4,000
		Sub Total					\$ 83,000
PAPER MILL ROAD WATER LINE EXTENSION							
1	3" Class 200 SDR 21 PVC	1,300	LF	\$ 15.00			\$ 19,500
2	Customer Services	3	EA	\$ 1,000.00			\$ 3,000
3	Creek Crossing	500	LF	\$ 150.00			\$ 75,000
4	Connect to Existing Water Line	1	EA	\$ 2,500.00			\$ 2,500
5	Blowoff Hydrant	1	EA	\$ 2,000.00			\$ 2,000
		Sub Total					\$ 102,000
BELL LANE WATER LINE EXTENSION							
1	3" Class 200 SDR 21 PVC	4,000	LF	\$ 15.00			\$ 60,000
2	Customer Services	3	EA	\$ 1,000.00			\$ 3,000
3	Gas Line Crossing	200	LF	\$ 100.00			\$ 20,000
4	Road Crossing / Pavement Replacement	20	LF	\$ 50.00			\$ 1,000
5	Connect to Existing Water Line	1	EA	\$ 2,500.00			\$ 2,500
6	Blowoff Hydrant	1	EA	\$ 2,000.00			\$ 2,000
		Sub Total					\$ 88,500
HAM HILL WATER LINE EXTENSION							
1	3" Class 200 SDR 21 PVC	2,300	LF	\$ 15.00			\$ 34,500
2	Customer Services	3	EA	\$ 1,000.00			\$ 3,000
3	Connect to Existing Water Line	1	EA	\$ 2,500.00			\$ 2,500
4	Blowoff Hydrant	1	EA	\$ 2,000.00			\$ 2,000
		Sub Total					\$ 42,000
AUTOMATIC RADIO READ METERS							
1	AMRs	1,000	EA	\$ 250.00			\$ 250,000
		Sub Total					\$ 250,000
SUBTOTAL AMOUNT							
							\$ 1,963,000.00
10% CONTINGENCY							
							\$ 190,000.00

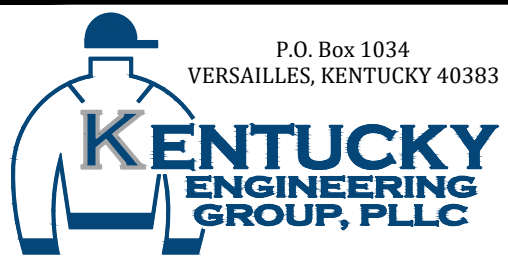
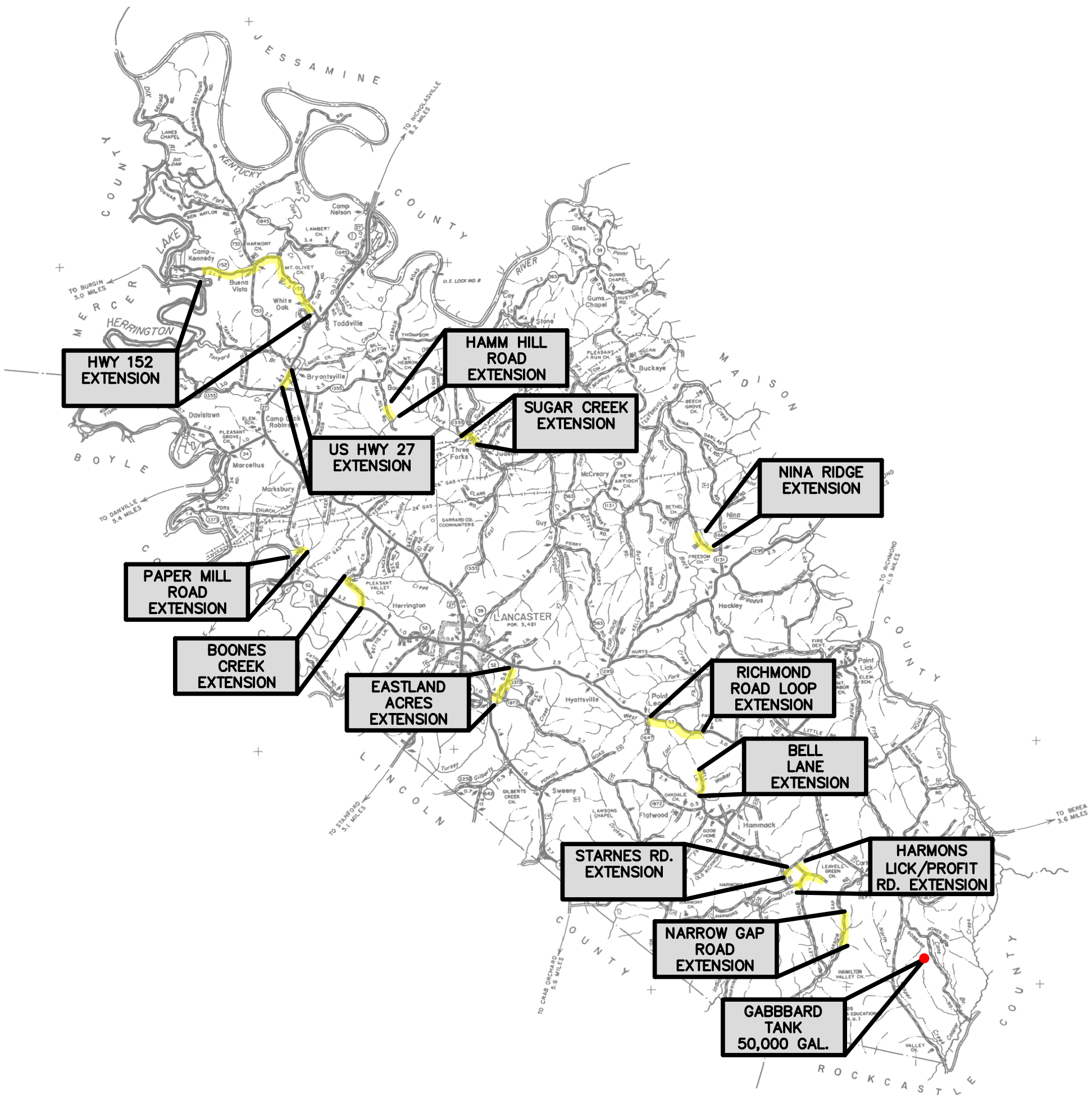
	ENGINEERING DESIGN	7.69%		\$ 195,000.00
	RESIDENT INSPECTION	4.64%		\$ 92,000.00
	LEGAL AND ADMINISTRATION			\$ 10,000.00
	LAND & RIGHTS			\$ 10,000.00
	ADDITIONAL SERVICES			\$ 40,000.00
	TOTAL ESTIMATED PROJECT COST			\$ 2,500,000.00



Preliminary Project Cost Estimate

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 Date : **11/09/18** Job No. :
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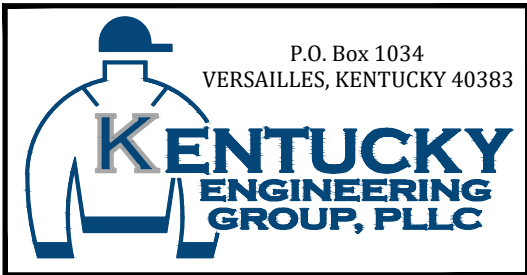
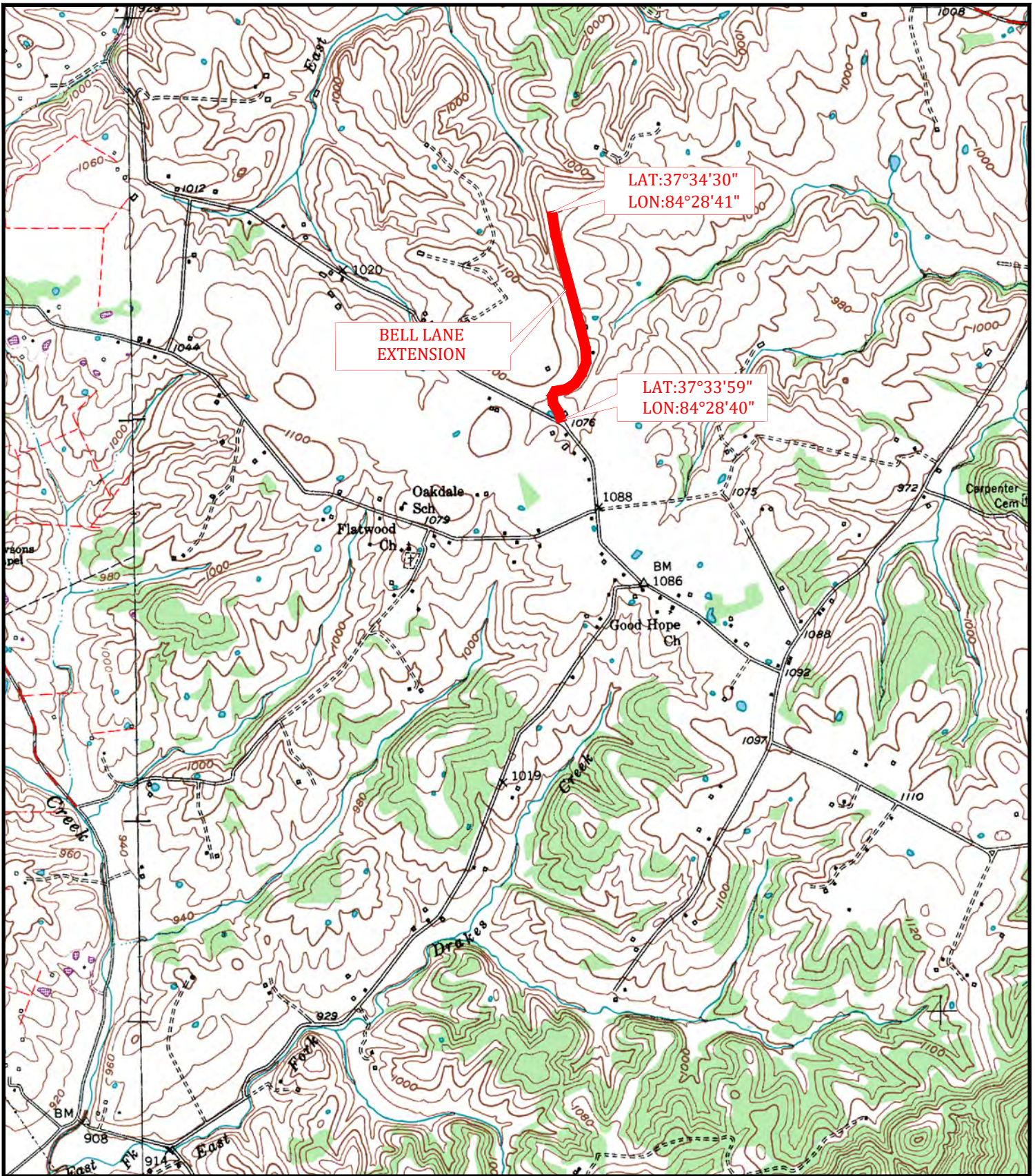
ITEM NO.	SUMMARY OF: 2020 Water System Improvements Additive Alternates	QUANTITY		COST PER UNIT	TOTAL COST
		NO. OF UNITS	UNIT MEAS.		
SUGAR CREEK ROAD (THREE FORKS AREA)					
1	3" Class 200 SDR 21 PVC	2,500	LF	\$ 15.00	\$ 37,500
2	Customer Services	4	EA	\$ 1,000.00	\$ 4,000
3	Directional Bore Creek Crossing	600	LF	\$ 150.00	\$ 90,000
4	Connect to Existing Water Line	1	EA	\$ 2,500.00	\$ 2,500
5	Blowoff Hydrant	1	EA	\$ 2,000.00	\$ 2,000
	Sub Total				\$ 136,000
US 27 (Mt Hebron to Canoe Creek) WATER LINE EXTENSION					
1	6" Class 200 SDR 21 PVC	3,600	LF	\$ 18.00	\$ 64,800
2	Road Bore	80	LF	\$ 150.00	\$ 12,000
3	Reconnect Customer Services	2	EA	\$ 1,000.00	\$ 2,000
4	Connect to Existing Water Line	2	EA	\$ 2,500.00	\$ 5,000
5	Blowoff Hydrant	2	EA	\$ 2,000.00	\$ 4,000
	Sub Total				\$ 87,800
BOONES CREEK (Pleasant Valley Church to 52) WL EXT					
1	4" Class 200 SDR 21 PVC	4,500	LF	\$ 15.00	\$ 67,500
2	Road Bore	60	LF	\$ 150.00	\$ 9,000
2	Directional Bore Creek Crossing	300	LF	\$ 150.00	\$ 45,000
3	Reconnect Customer Services	4	EA	\$ 1,000.00	\$ 4,000
4	Connect to Existing Water Line	2	EA	\$ 2,500.00	\$ 5,000
5	Blowoff Hydrant	2	EA	\$ 2,000.00	\$ 4,000
	Sub Total				\$ 134,500
STARNES ROAD					
1	4" Class 200 SDR 21 PVC	1,700	LF	\$ 15.00	\$ 25,500
2	Customer Services	2	EA	\$ 900.00	\$ 1,800
3	Road Bore	40	LF	\$ 150.00	\$ 6,000
4	Connect to Existing Water Line	2	EA	\$ 2,500.00	\$ 5,000
5	Blowoff Hydrant	1	EA	\$ 2,000.00	\$ 2,000
	Sub Total				\$ 40,300
KY 52 CL 160 WL REPLACEMENT (RICHMOND RD LOOP)					
1	6" Class 200 SDR 21 PVC	9,200	LF	\$ 18.00	\$ 165,600
2	Creek Crossing	410	LF	\$ 150.00	\$ 61,500
3	Road Bore	110	LF	\$ 150.00	\$ 16,500
4	Reconnect Customer Services	20	EA	\$ 1,000.00	\$ 20,000
5	Connect to Existing Water Line	5	EA	\$ 2,500.00	\$ 12,500
6	Blowoff Hydrant	3	EA	\$ 2,000.00	\$ 6,000
	Sub Total				\$ 282,100
	SUBTOTAL AMOUNT				\$ 680,700.00
	10% CONTINGENCY				\$ 69,000.00
	ENGINEERING DESIGN	9.50%			\$ -
	RESIDENT INSPECTION	6.48%			\$ 45,000.00
	LEGAL AND ADMINISTRATION				\$ 2,000.00
	ADDITIONAL SERVICES				\$ 5,000.00
	TOTAL ESTIMATED PROJECT COST				\$ 801,700.00



GARRARD COUNTY WATER ASSOCIATION
2020 WATER SYSTEM IMPROVEMENTS
AUGUST, 2020

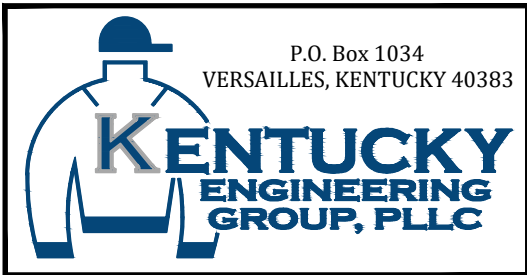
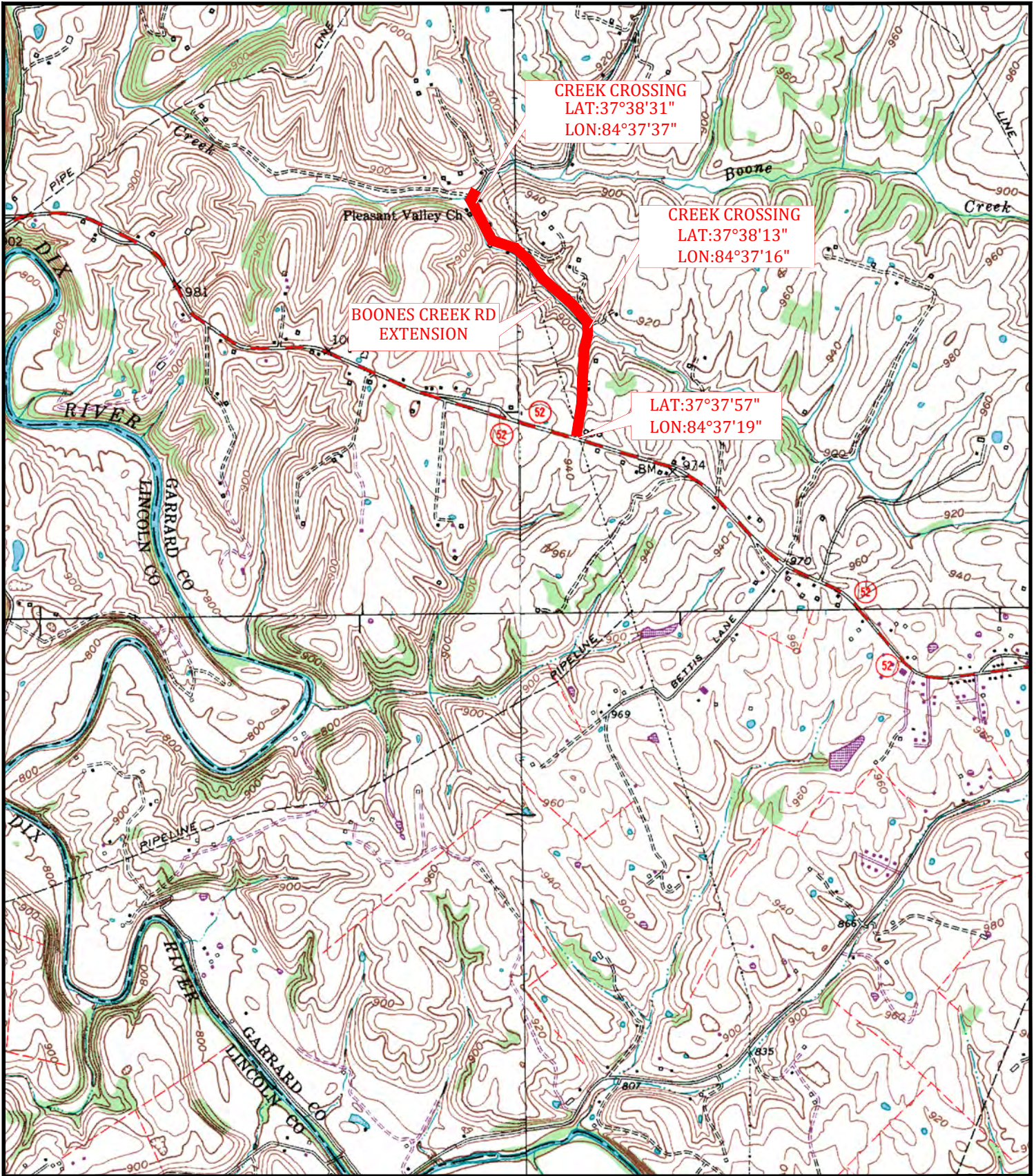
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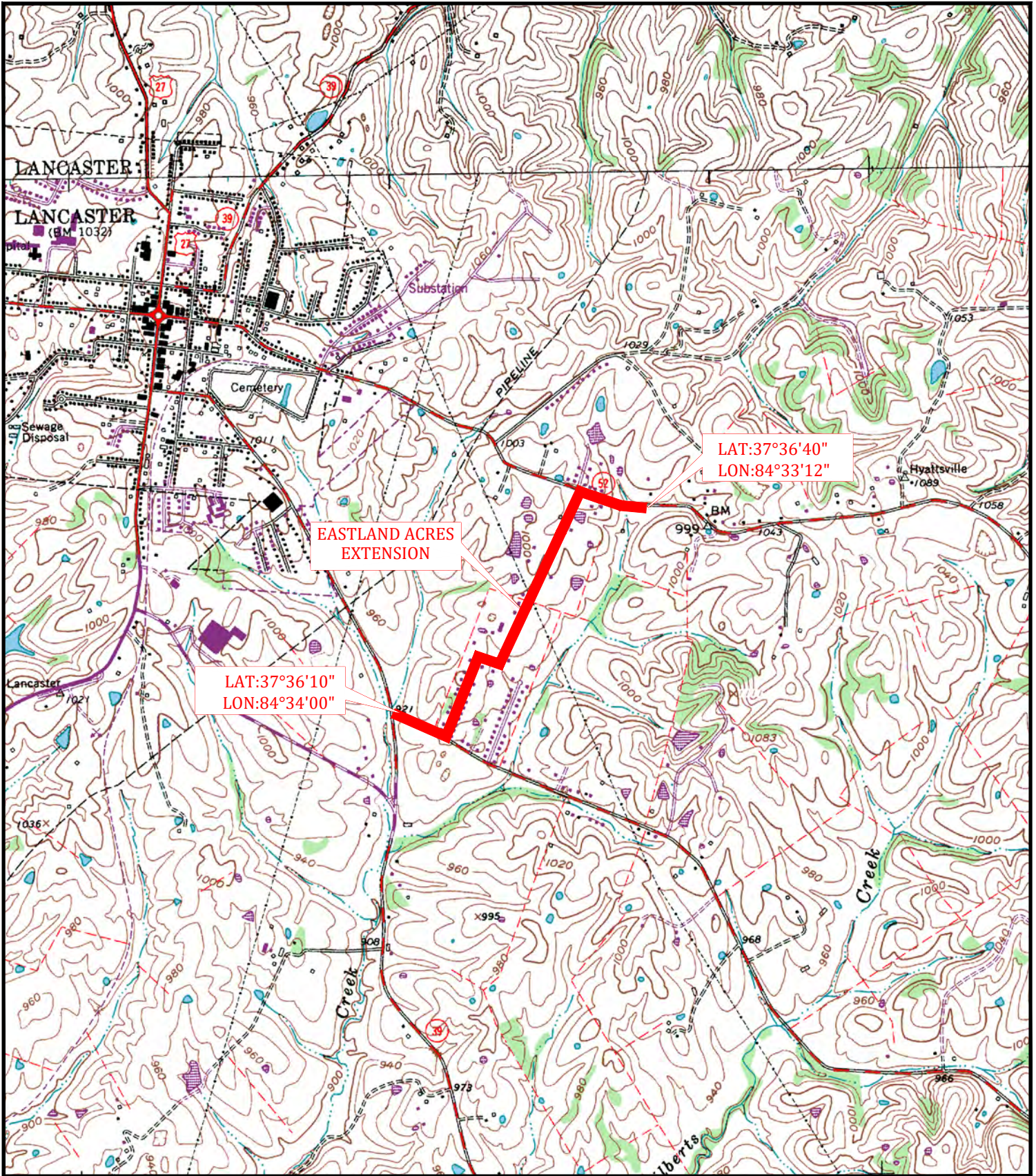
**BELL LANE
WATER MAIN EXTENSION**
FOR THE
GARRARD COUNTY WATER ASSOCIATION
GARRARD COUNTY, KENTUCKY

Project No. 19014
Date JUNE, 2020
Dwg. No.
Sheet 1



**BOONES CREEK ROAD
WATER MAIN EXTENSION**
FOR THE
GARRARD COUNTY WATER ASSOCIATION
GARRARD COUNTY, KENTUCKY

Project No. 19014
Date JUNE, 2020
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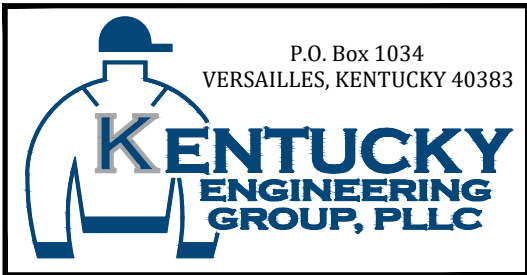
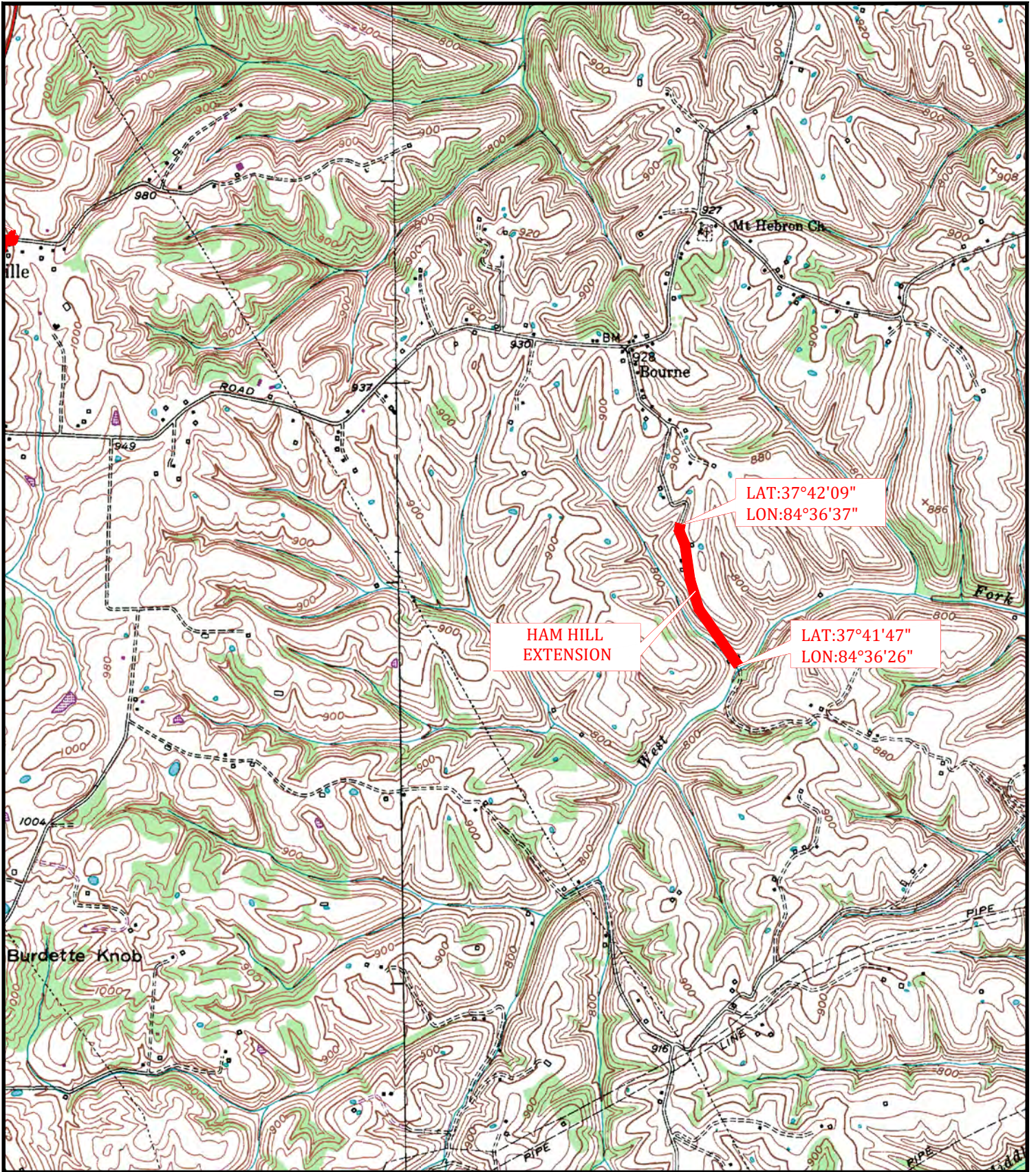


P.O. Box 1034
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KENTUCKY
ENGINEERING
GROUP, PLLC

**EASTLAND ACRES
WATER MAIN EXTENSION**
FOR THE
GARRARD COUNTY WATER ASSOCIATION
GARRARD COUNTY, KENTUCKY

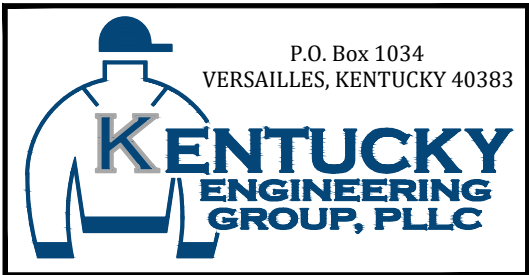
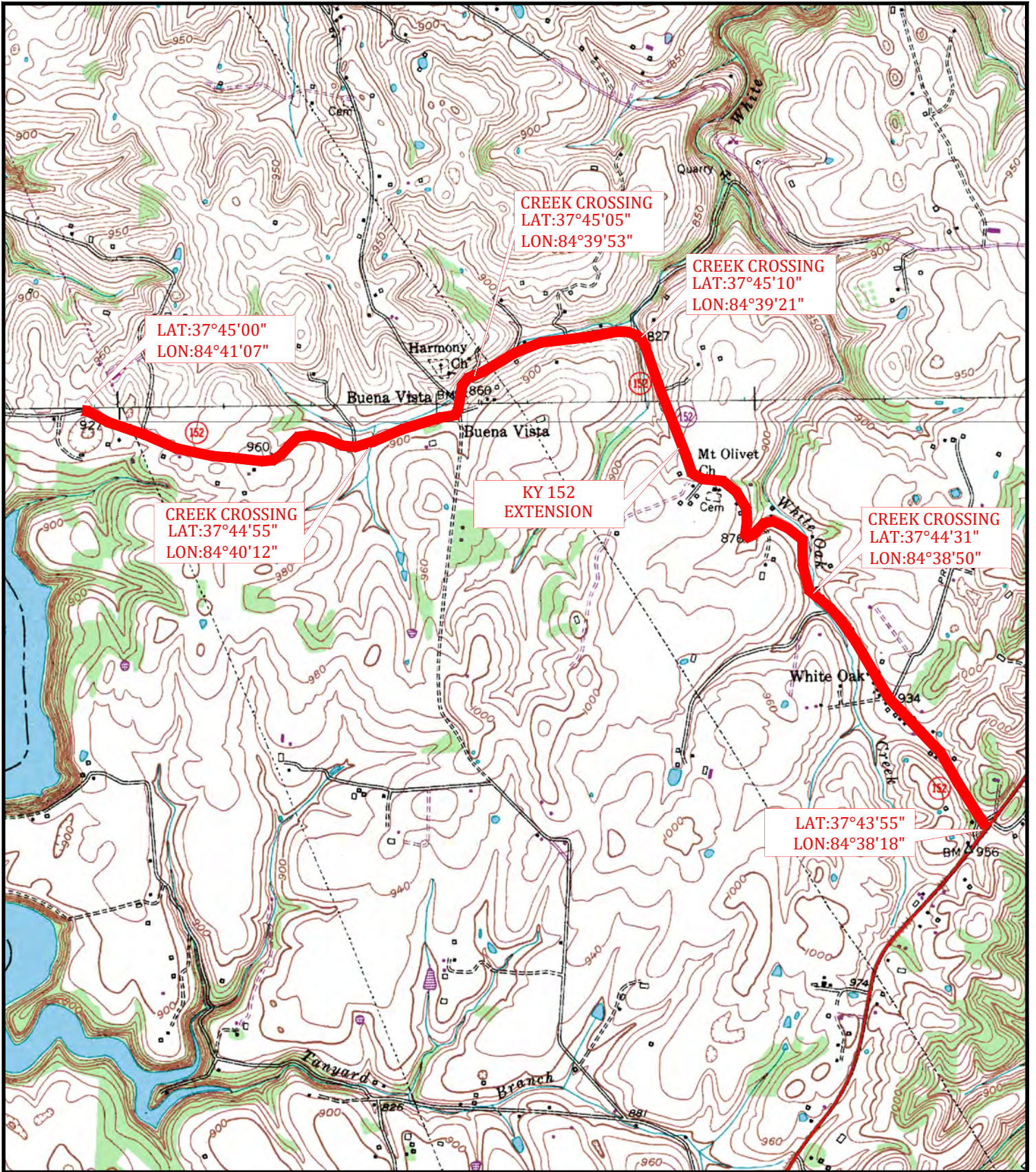
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HAM HILL WATER MAIN EXTENSION

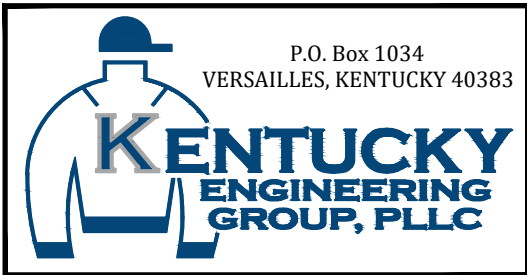
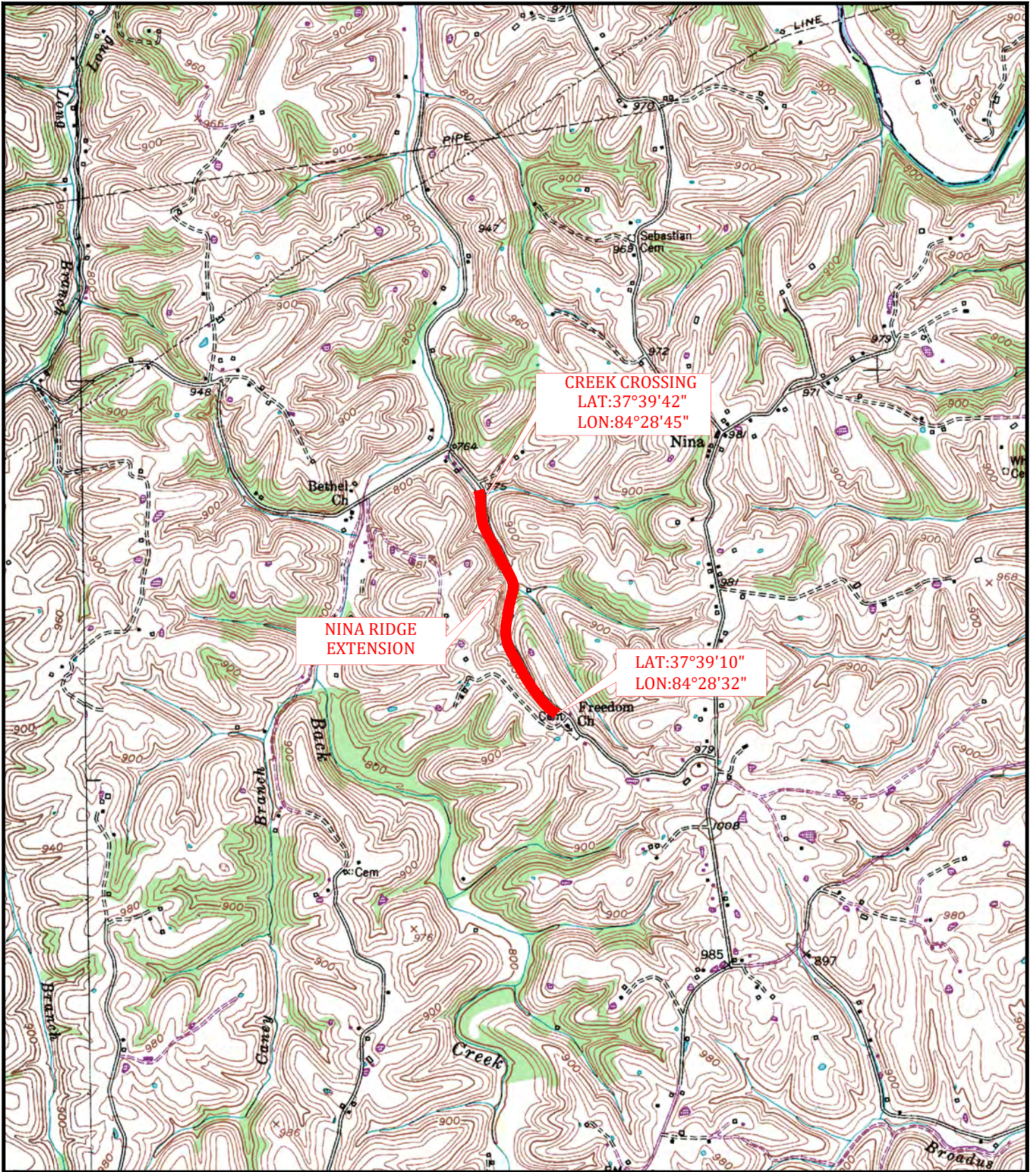
FOR THE
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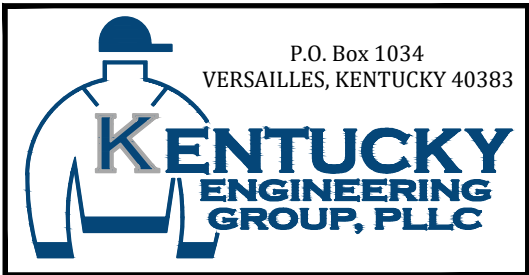
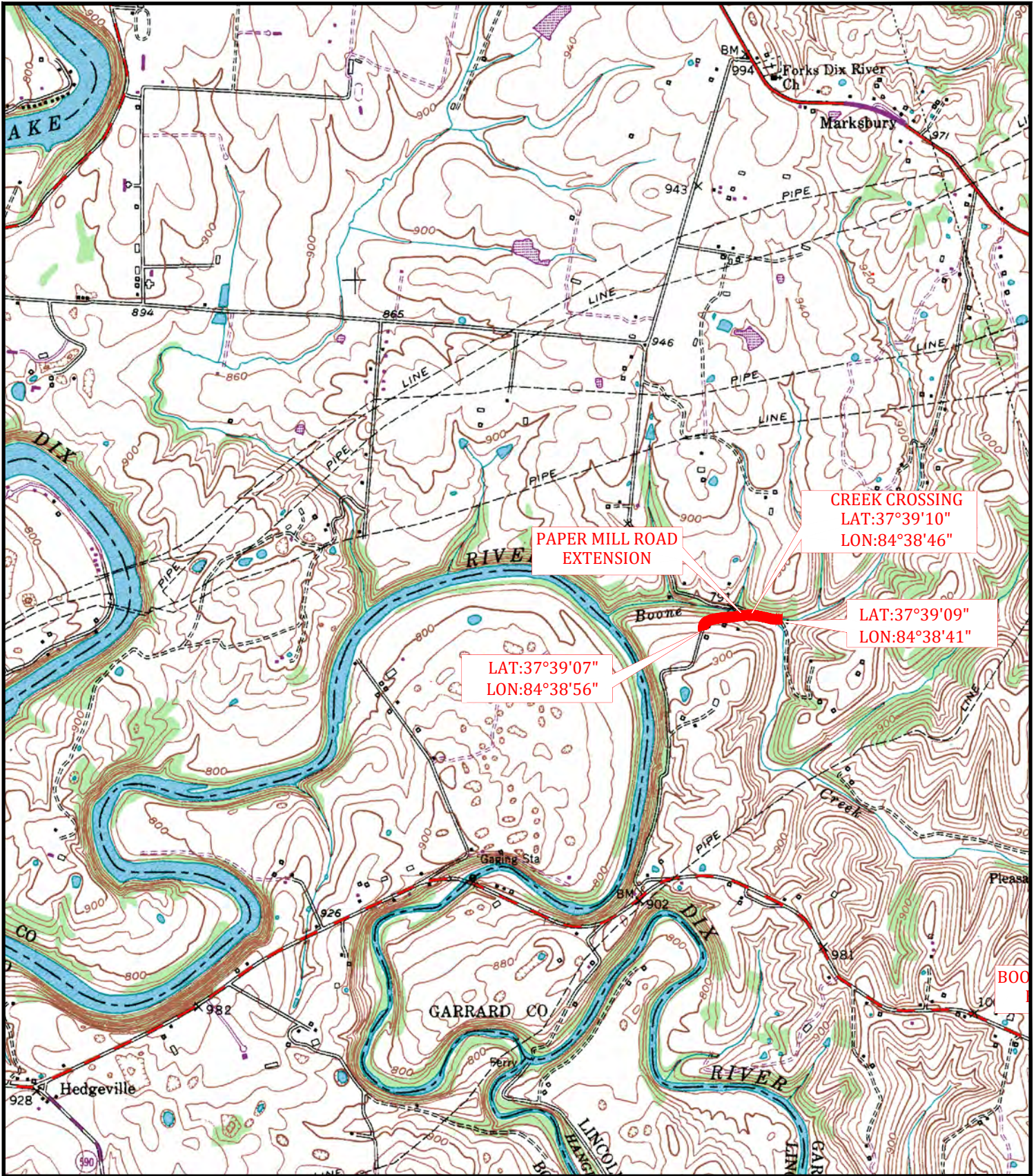
KY 152
WATER MAIN EXTENSION
FOR THE
GARRARD COUNTY WATER ASSOCIATION
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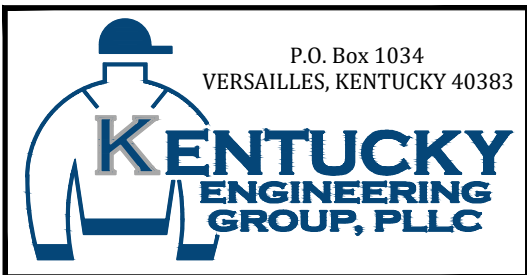
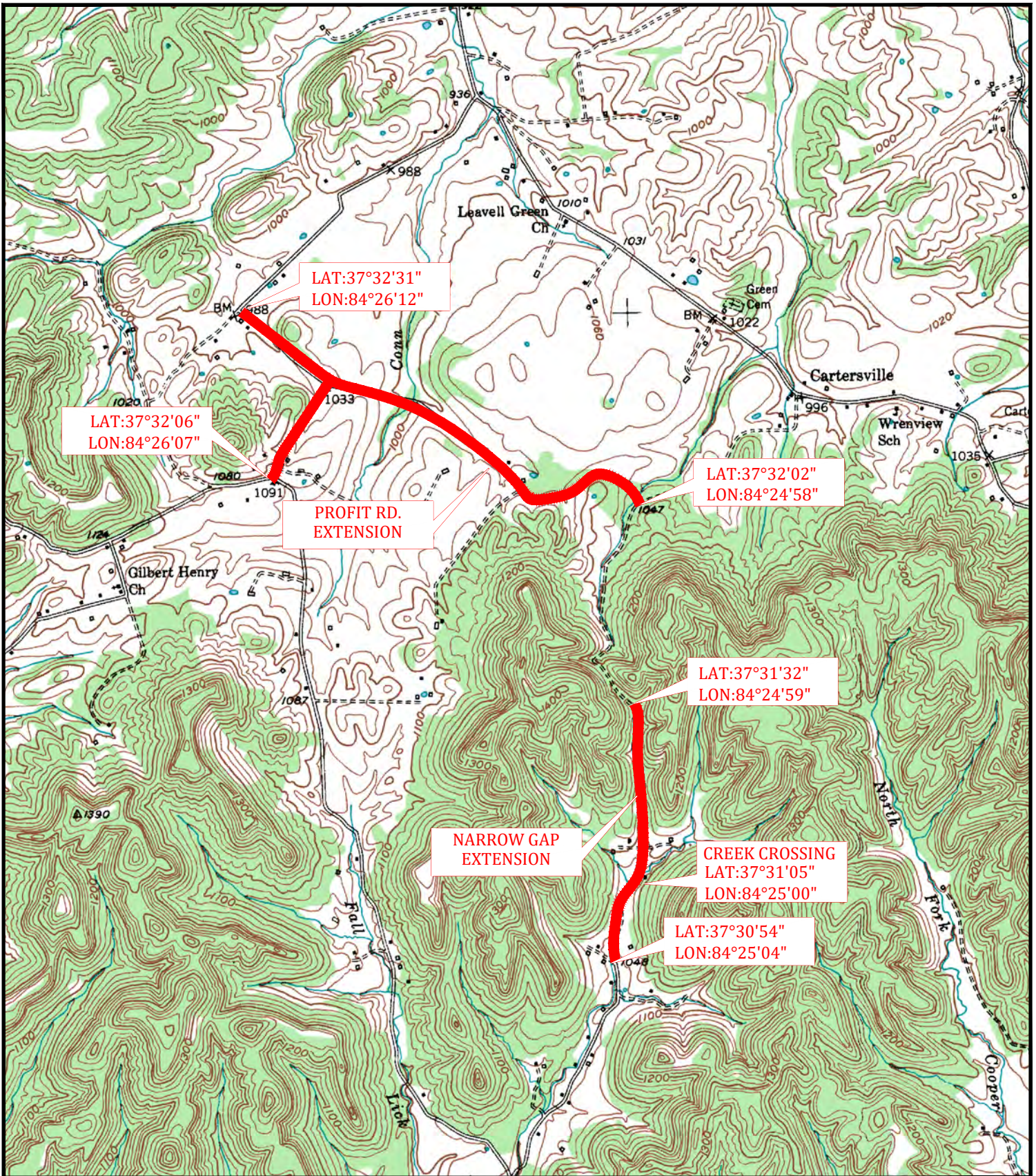
**NINA RIDGE
WATER MAIN EXTENSION**
FOR THE
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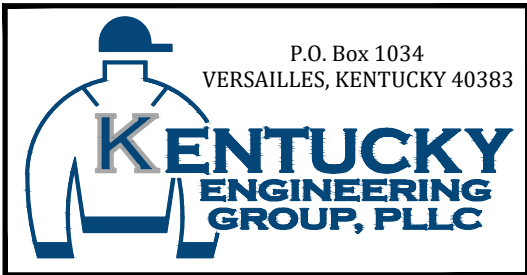
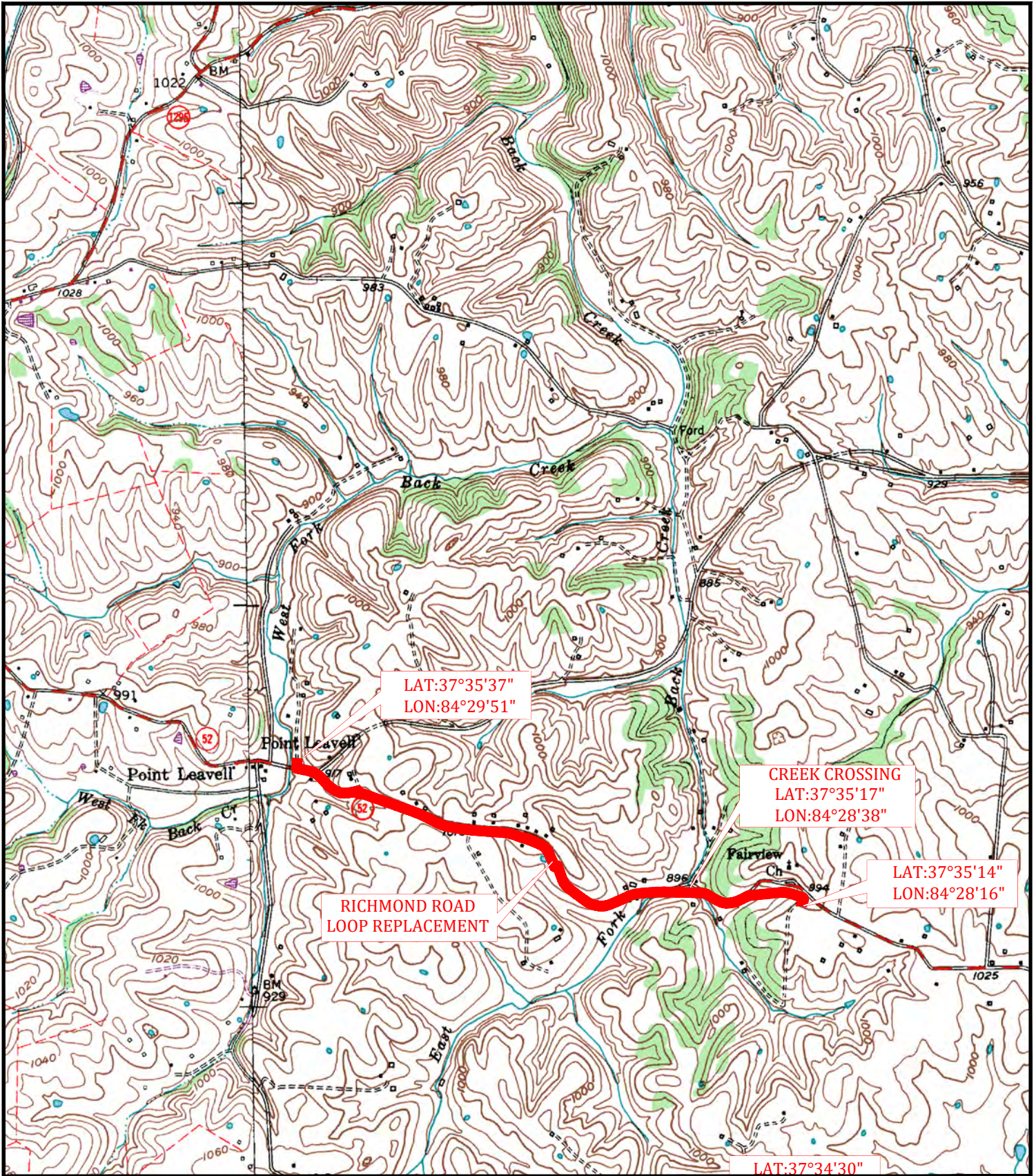
**PAPER MILL ROAD
WATER MAIN EXTENSION**
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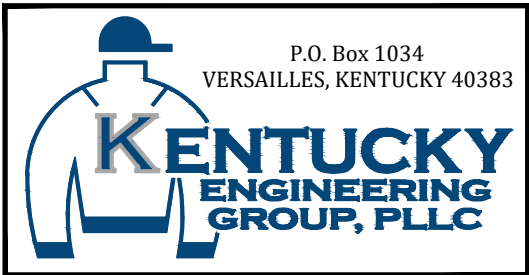
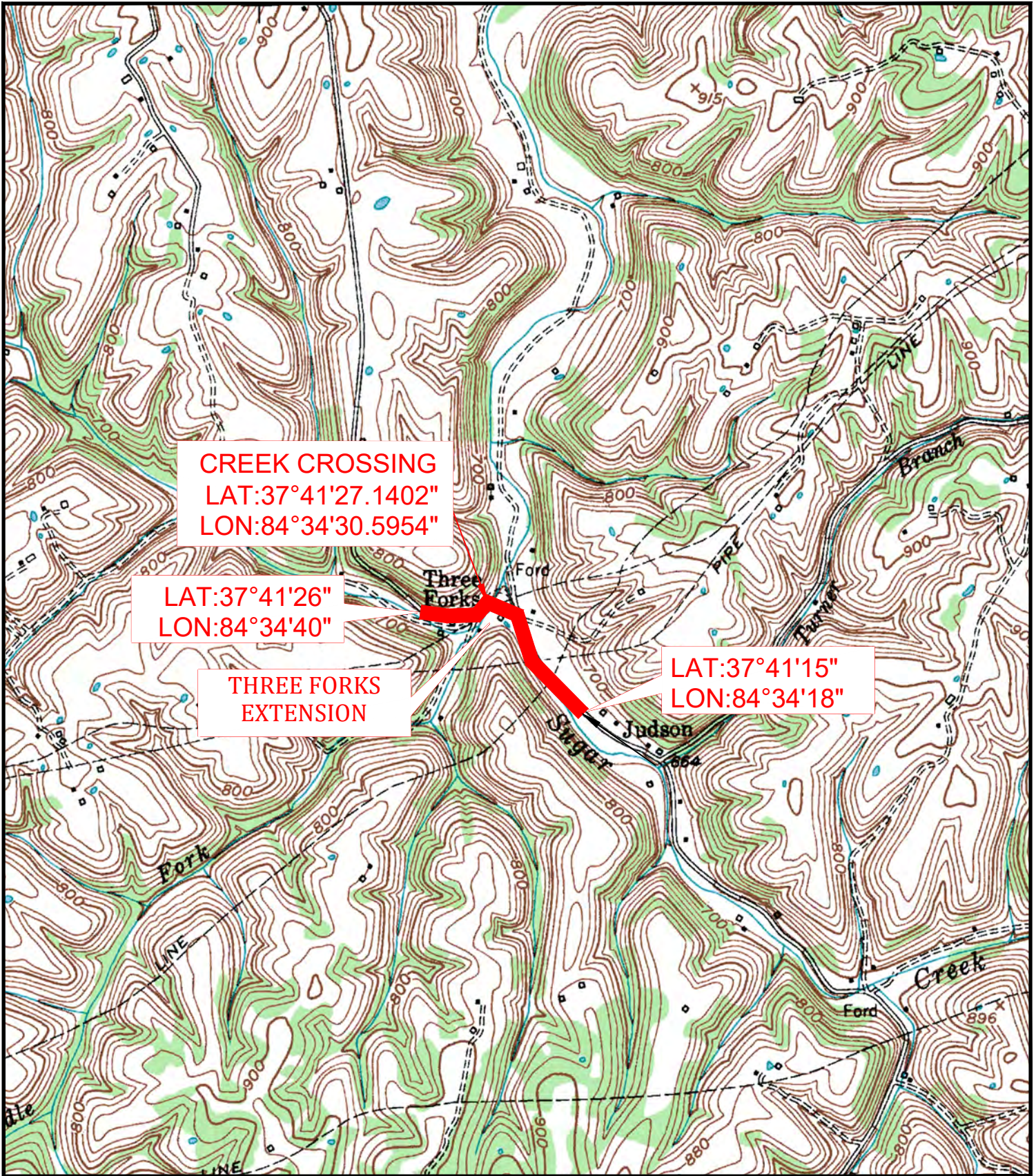
**PROFIT RD. & NARROW GAP
WATER MAIN EXTENSION**
FOR THE
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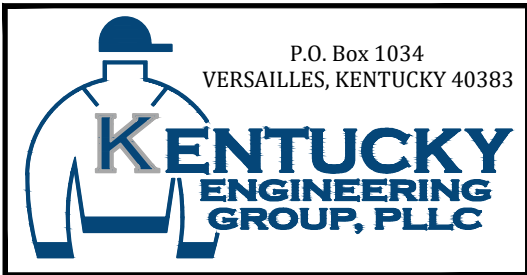
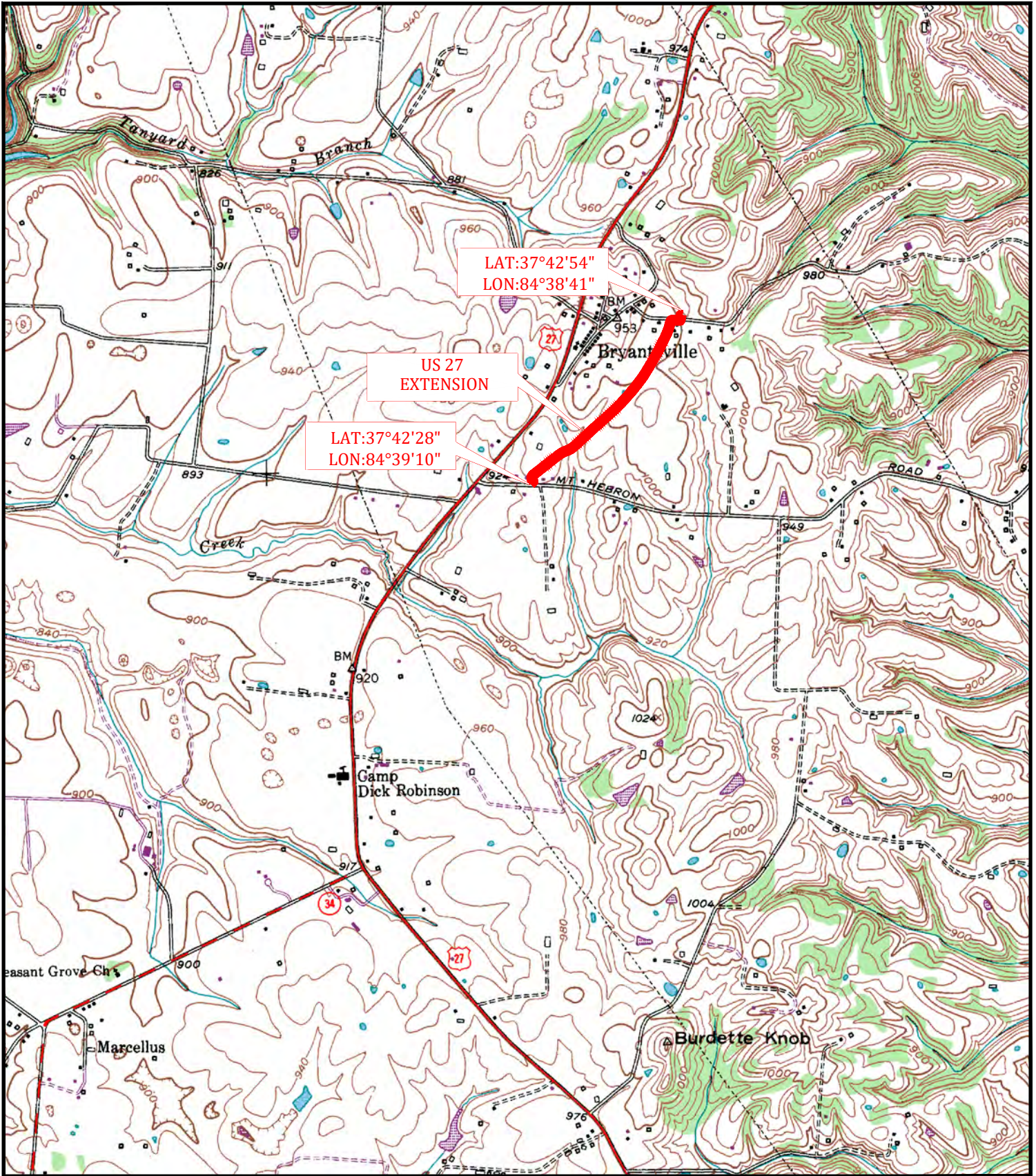
**RICHMOND ROAD LOOP
WATER MAIN REPLACEMENT**
FOR THE
GARRARD COUNTY WATER ASSOCIATION
GARRARD COUNTY, KENTUCKY

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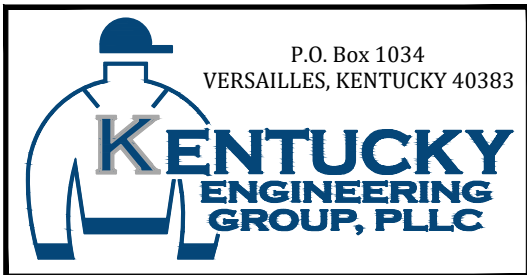
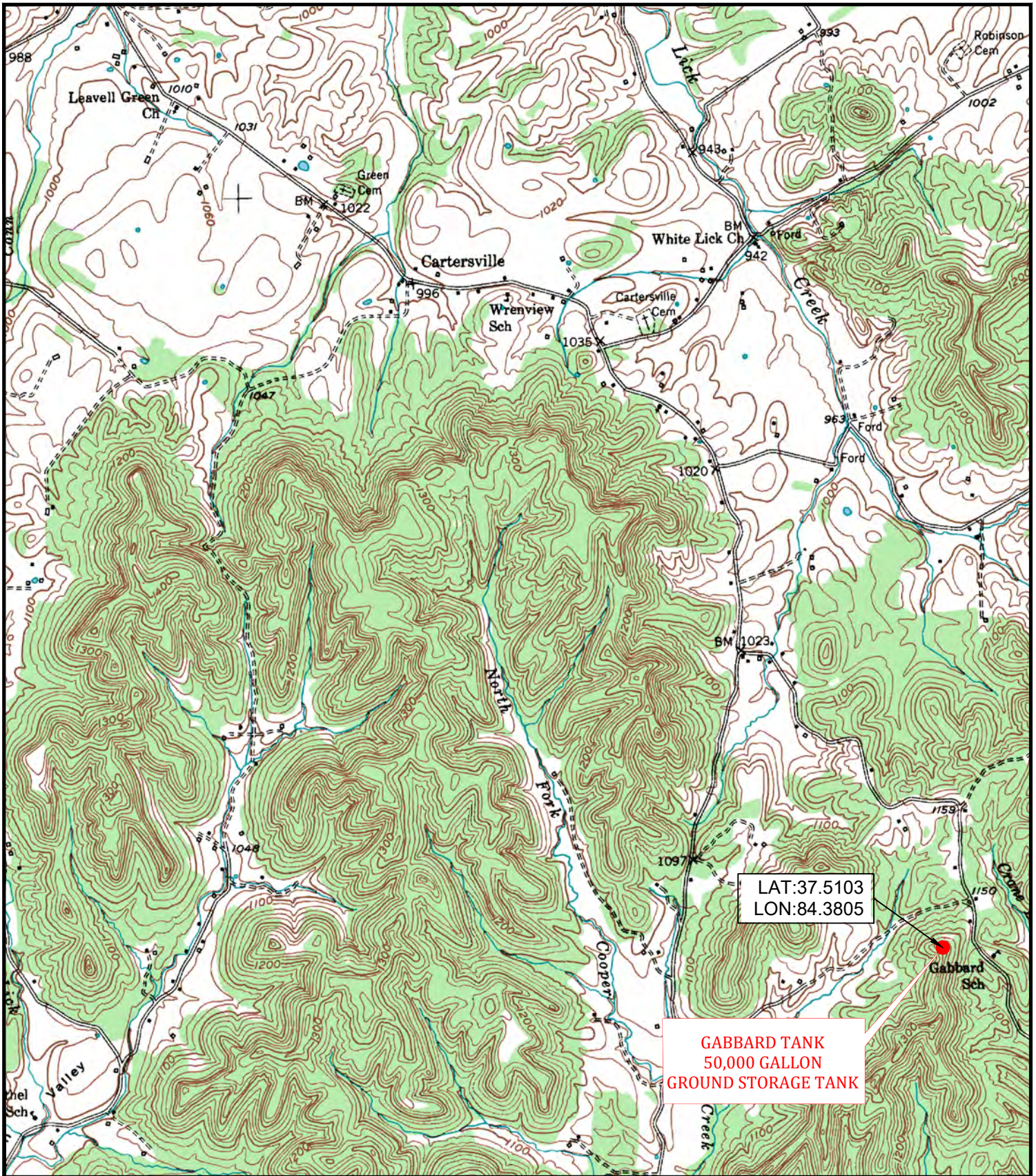
**THREE FORKS
WATER MAIN EXTENSION**
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**US 27 (MT. HEBRON TO CANOE
CREEK) WATER MAIN EXTENSION
FOR THE
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GARRARD COUNTY, KENTUCKY**

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2020 WATER SYSTEM
IMPROVEMENTS
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