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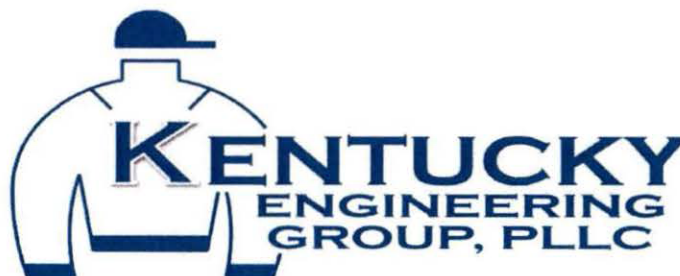
OCT 17 2018

PUBLIC SERVICE
COMMISSION

BRACKEN COUNTY WATER DISTRICT
WATER SYSTEM IMPROVEMENTS
PRELIMINARY ENGINEERING REPORT



BRACKEN COUNTY WATER DISTRICT
1324 Brooksville Germantown Road
Brooksville, KY 41004
October 2016



BRACKEN COUNTY WATER DISTRICT PRELIMINARY ENGINEERING REPORT WATER SYSTEM IMPROVEMENTS

I. GENERAL

The Bracken County Water District (BCWD) was formed in 1960. The existing system consists of approximately 340 miles of water lines with 4 functioning water storage tanks and 3 booster pump stations that serve approximately 2,492 customers in Bracken County.

II. PROJECT PLANNING AREA

A. Location

The BCWD is located in Northern Kentucky in Bracken County. With the exception of the Cities of Augusta and Brooksville, the BCWD serves the majority of Bracken County along with a few customers in Mason, Pendleton and Robertson Counties.

The topography of Bracken County is moderately to well dissected, but some of the ridges are flat-topped, particularly northwest of Germantown in the eastern part of the county. Local reliefs of 150 to 200 feet are common near the small streams. Greatest local reliefs are along the Ohio Valley in the northern part of the county, where uplands are 300 to 400 feet above the river. The highest elevations in Bracken County are found along the drainage divide between Licking River and the small creeks that flow directly into the Ohio. Elevations of 940 to 980 feet are common there; 980 feet is the highest recorded in the county.

B. Environmental Resources

The major environmental features in the area feature a variety of landforms and topographic change from extremely steep to relatively flat. The gradual undulating terrain is the reason for a relatively few number of water storage tanks and pump stations. Water pressures range from 30 psi to over 185 psi in sections of the system. Many of the hollows are in floodplains in particular along the Ohio River and along the Licking River along the southern boundary of the county. 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 BCWD the population of Bracken County has continued to grow. The water system has had

growth over the past 20 years because of numerous line extension projects. The population projections for Bracken County are shown below.

	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>
Population	8,488	8,744	8,810	8,672

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 BCWD system was originally built in the 1960's. The BCWD purchases the majority of its water from the City of Augusta. Numerous water line extension projects have been developed over the past 50 years to establish the current BCWD customer base which serves approximately 97% of Bracken County.

C. Condition of Facilities

BCWD currently purchases an average of 400,000 gallons a day from the City of Augusta. The system is in good to fair condition and work continues to improve the older, undersized sections of the BCWD.

Several of the original transmission water mains that connect to the City of Augusta water system and transport the majority of the BCWD water to its customers are undersized. During periods of peak demand BCWD struggles to keep certain water storage tanks adequately supplied and customers can experience underserved water supply/pressure; in particular the southwestern and northwestern 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 BCWD 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 BCWD covers a vast geographic area, the fuel cost has had a tremendous impact on cash flow.

IV. NEED FOR THE PROJECT

A. Health and Safety

The proposed project to upgrade approximately 9.3 miles of distribution mains, replace approximately 23 miles of asbestos cement distribution mains and replace approximately 150 customer service meters will help to improve overall water quality. Improving water turnover/water age by eliminating older, problematic distribution mains and removing 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.

Many of the families living in the project areas currently rely on asbestos cement distribution water mains. Due to the age and material of these mains there are many breaks that have to be repaired and create issues for these households related to water quality and continuity of service. This exposes some families to poor quality water and limits the amount of water available to them.

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

B. System O&M

By upgrading approximately 9.3 miles of distribution mains the BCWD will reduce their pumping costs and therefore reduce the amount of operation and maintenance budget required for the BCWD system. It will also enable the BCWD to transmit more water to its distribution system.

V. ALTERNATIVES CONSIDERED

Alternatives considered included replacing asbestos cement distribution mains with like size distribution mains but this does not provide BCWD with any hydraulic improvements which in turn help to reduce operation and maintenance expenses. An additional alternative considered was to only replace the lines as they deteriorate to the point of not functioning. This is cost prohibitive for the BCWD and does not benefit the customers by providing a safe, dependable, high quality product.

VI. PROPOSED ALTERNATIVE

The proposed project is to upgrade approximately 9.3 miles of distribution mains, replace approximately 23 miles of asbestos cement distribution mains and replace approximately 150 customer service meters. The upgrade of distribution mains occurs primarily in the central portion of the BCWD distribution system in the

vicinity of the city of Brooksville. These upgrades allow for the BCWD to hydraulically flow water to all areas of their system in an efficient manner during normal operations and it also provides alternative feeds during emergency situations.

The areas in which distribution main sizes will be increased include Bluegrass Road, located east, northeast of Brooksville, an area along Highway 22, located in the northwest section of the BCWD system, an area near Powersville, which is located southwest of the city of Brooksville, an area north of Brooksville, located between Highway 8 and Highway 9 and an area along Highway 165, which is just south of Powersville. As previously discussed these areas are all centrally located near the city of Brooksville and the BCWD will be able to flow water efficiently throughout all areas of its system.

Additionally, the project will replace approximately 23 miles of asbestos cement distribution main. There are eleven different areas in which this distribution main will be replaced which are scattered throughout the entire distribution system. Some of the communities where this replacement will take place include Chatham, Powersville, Foster, Frogtown, Bladeston, Johnsville, Lenoxburg, and near Augusta. Additionally, there will be distribution main replaced along Highway 22, Highway 1011, Bluegrass Road, and Old Highway 19.

The project will also include replacing approximately 500 feet of an 8" PVC cross country transmission main. This section of distribution main is located in an area that has seen repeated leaks due to the topography in which it is located. As a main feed to the distribution system any problems that occur present problems for the entire distribution system.

Lastly, the project will include the replacement of approximately 150 customer service meters with radio read meters. The replacement of these meters will create efficiencies for the BCWD in reading meters, detecting leaks, and providing improved service to its customers.

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

A summary of the proposed project is as follows:

	Approximate Year in Service	Approximate Age (in years)
Upgrade of 9.3 miles of distribution main	Highway 22	1962
	Bluegrass Road	1962
	HWY 165 to Belmont Road	1962
	Highway 1011	1962
	Asbury Road to Dutch Ridge	1962
	Shoftstall Road	1984

Replacement of approximately 23 miles of AC water main	Highway 22	1963
	Highway 1011	1963
	Highway 1019	1964
	Highway 1159	1964
	Highway 1109	1963
	Old Hwy 19	1964
	Highway 10	1964

Hydraulically the project takes advantage of elevations to reduce long-term pumping costs while also improving water quality and maintaining adequate pressure in all areas of the distribution system.

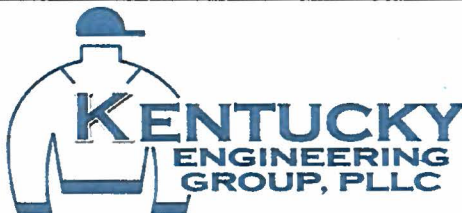
The total project cost is shown on the detailed engineer estimate located at the end of the report.

It is expected that the BCWD 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 – February 2017
2. Secure Land/Easement/Encroachment Permits – March 2017
3. Division of Water Submittal – March 2017
4. Advertise for Bids – May 2017
5. Contract Award/Initiate Construction – July 2017
6. Substantial Completion – July 2018
7. Final Completion/Initiation of Operation – August 2018

<div></div>		Preliminary Project Cost Estimate				
		Project : BRACKEN COUNTY WATER DISTRICT				
		Date : 08/08/16		Job No. :		
		Revised : 09/29/16		Est. By: PBR		
ITEM NO.	SUMMARY OF: 2016 Water System Improvements	QUANTITY		COST PER UNIT		TOTAL COST
		NO. OF UNITS	UNIT MEAS.			
AC WATER MAIN REPLACEMENT						
	Chatham to near Germantown					
1	4" Class 200, SDR 21 PVC	28,500	LF	\$ 20.00		\$ 570,000.00
2	Customer Reconnects	23	EA	\$ 600.00		\$ 13,800.00
	Sub Total					\$ 583,800.00
HWY 22						
1	4" Class 200, SDR 21 PVC (Replace with 6")	4,000	LF	\$ 25.00		\$ 100,000.00
2	6" Class 200, SDR 21 PVC	19,000	LF	\$ 25.00		\$ 475,000.00
3	8" Class 200, SDR 21 PVC	2,000	LF	\$ 30.00		\$ 60,000.00
4	6" D.I.P.	400	LF	\$ 50.00		\$ 20,000.00
5	Customer Reconnects	41	EA	\$ 600.00		\$ 24,600.00
	Sub Total					\$ 679,600.00
Bluegrass Rd						
1	6" Class 200, SDR 21 PVC (Replace with 8")	17000	LF	\$ 30.00		\$ 510,000.00
2	Customer Reconnects	20	EA	\$ 600.00		\$ 12,000.00
	Sub Total					\$ 522,000.00
Section near Powersville						
1	6" Class 200, SDR 21 PVC (Replace with 8")	7500	LF	\$ 30.00		\$ 225,000.00
2	Customer Reconnects	20	EA	\$ 600.00		\$ 12,000.00
	Sub Total					\$ 237,000.00
HWY 1011						
1	4" Class 200, SDR 21 PVC	12500	LF	\$ 20.00		\$ 250,000.00
2	4" Class 200, SDR 21 PVC (Replace with 6")	6000	LF	\$ 25.00		\$ 150,000.00
3	Customer Reconnects	32	EA	\$ 600.00		\$ 19,200.00
	Sub Total					\$ 419,200.00
HWY 1019 to Foster						
1	4" Class 200, SDR 21 PVC	23000	LF	\$ 20.00		\$ 460,000.00
2	4" D.I.P.	400	LF	\$ 40.00		\$ 16,000.00
3	Customer Reconnects	30	EA	\$ 600.00		\$ 18,000.00
	Sub Total					\$ 494,000.00
Frogtown						
1	8" Class 200, SDR 21 PVC	800	LF	\$ 25.00		\$ 20,000.00
2	8" D.I.P.	400	LF	\$ 60.00		\$ 24,000.00
3	Customer Reconnects	4	EA	\$ 600.00		\$ 2,400.00
	Sub Total					\$ 46,400.00
HWY 1159 - Bladeston						
1	4" Class 200, SDR 21 PVC	1500	LF	\$ 20.00		\$ 30,000.00
2	Customer Reconnects	8	EA	\$ 600.00		\$ 4,800.00
	Sub Total					\$ 34,800.00
Old HWY 19 from Augusta						
1	6" Class 200, SDR 21 PVC	3300	LF	\$ 25.00		\$ 82,500.00
2	Customer Reconnects	6	EA	\$ 600.00		\$ 3,600.00
	Sub Total					\$ 86,100.00
HWY 1109 - Johnsville						
1	6" Class 200, SDR 21 PVC	1000	LF	\$ 25.00		\$ 25,000.00
2	Customer Reconnects	5	EA	\$ 600.00		\$ 3,000.00
	Sub Total					\$ 28,000.00
HWY 10 - Lenoxburg						
1	6" Class 200, SDR 21 PVC	1300	LF	\$ 25.00		\$ 32,500.00
2	Customer Reconnects	7	EA	\$ 600.00		\$ 4,200.00
	Sub Total					\$ 36,700.00
MISCELLANEOUS SYSTEM IMPROVEMENTS						
1	Water Main Replacement 8" cross country	500	LF	\$ 35.00		\$ 17,500.00
2	Increase Line Size from Asbury to Dutch Ridge (to 6")	7200	LF	\$ 25.00		\$ 180,000.00
3	Increase Line Size from HWY 165 to Belmont (to 6")	8500	LF	\$ 25.00		\$ 212,500.00
4	Replace Customer Meter Set	130	EA	\$ 1,200.00		\$ 156,000.00
	Sub Total					\$ 566,000.00
SUBTOTAL AMOUNT						
10% CONST. CONTINGENCY						
ENGINEERING DESIGN			6.99%			\$ 260,800.00
RESIDENT INSPECTION			3.78%			\$ 141,100.00
LEGAL AND ADMINISTRATION						\$ 10,000.00
ADDITIONAL SERVICES						\$ 50,000.00
TOTAL ESTIMATED CONSTRUCTION COST						

