PRELIMINARY ENGINEERING REPORT

East – West Interconnect Project Phase 2 – Contract No. 4 Salt River Water Pumping Station

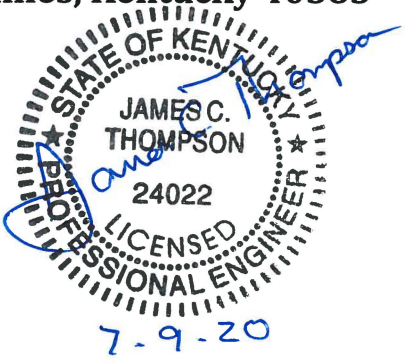
Grayson County Water District

Leitchfield, Kentucky

Kentucky Engineering Group, PLLC

P.O. Box 1034

Versailles, Kentucky 40383



July, 2020

KEG Project No. 19019

GRAYSON COUNTY WATER DISTRICT
PRELIMINARY ENGINEERING REPORT
EAST/WEST INTERCONNECT PHASE 2 – Contract No. 4 - SALT RIVER WATER PUMPING STATION

I. GENERAL

The Grayson County Water District (GCWD) was formed by a group of visionaries with the idea of safe affordable drinking water for the rural areas of Grayson County in 1969. Fiscal Court passed a resolution officially creating the Grayson County Water District and in 1974 the district began providing water to the county.

The early stages of the District were more centered on the nucleolus of the City of Leitchfield which was where the District purchased the water it delivered to its customers. The first lines had been placed east of Leitchfield to Clarkson and towards Big Clifty, west towards Millwood and south towards Shrewsbury. Early records show that at the close of the year 1976 the District had 357 services, and 22 miles of line. The average customer had grown to use 2,449 gallons of water each month at a cost of $9.82. The Water District had assets of $576,390.00 and annual sales of $51,554.

Today the Water District has over 6,900 services, 563 miles of main water line, approximately 44 miles of service line, eight water storage tanks, seven booster pump stations, and 14 pressure regulator stations. The residential customer usage is now 3170 gallons per month at a cost of $34.49. The Water District now has assets of $22,882,081 and annual sales of $3,460,578.00.

For more than thirty years the Water District purchased all its water from Leitchfield Utilities, with rapid growth and expansion it became necessary for the Water District to secure a larger water source and the decision was made to build a water treatment plant of their own. In early 2000, the Board began plans for a water plant and in July 2002 they began treating approximately 60% of the water needed for the customers of the Grayson County Water District. Contracts are still in place today with Leitchfield Utilities for up to 950,000 gallons of water per day, and the Water District can treat up to 2,100,000 gallons of water per day for a total available 3,050,000 gallons per day.

Today purchased water from Leitchfield Utilities serves GCWD's customers in the eastern part of Grayson County, Brandenburg Rd, and Annetta Rd. areas. The remaining areas of the County are served by its own plant. The Water District has an average daily consumption of 1,100,000 gallons per day and peak daily consumption of 1,800,000. The Water District also has connections with Butler County, Edmonson County, Ohio County and Hardin County Water District 2, for emergency back-up use. Approximately half of the current consumption, 550,000 to

900,000 gallons per day, is purchased from the Leitchfield Utilities and the rest is served by the District's own Water Treatment Plant.

II. PROJECT PLANNING AREA

A. Location

The GCWD is in west central Kentucky in Grayson County. Except for the City of Leitchfield, the GCWD serves the majority of Grayson County. A map of the GCWD's service area is located at the end of this report.

"Grayson County occupies an upland area that includes parts of the Mississippian Plateaus Region west of the Dripping Springs Escarpment and the eastern edge of the Western Kentucky Coal Field. Much of the area is characterized by flat-topped, sandstone-capped ridges. This flat appearance is broken by occasional knobs and ridges rising above the general plateau level and valleys incised 150 to 200 feet into the upland. Karst features such as sinking streams, sinkholes, and springs are present locally in the eastern part of the county.

The highest elevations are found in the eastern part of the county, and the elevations of the upland ridges gradually decline to the west. The highest point in the county is on Buzzard Ridge, about 3 1/2 miles southwest of Millerstown, where an elevation of 963 feet is recorded. Slopes between streams and the adjacent plateau in the head waters areas are generally steep, in some places precipitous, reflecting resistant rock units capping the uplands.

The Rough River and its tributaries form the northern boundary of Grayson County. The lowest elevation is approximately 395 feet, at the point where the Rough River leaves the county. Rough River Lake, a flood-control facility on the Rough River, has a normal pool elevation of 495 feet and a flood-pool elevation of 524 feet.

Nolin Lake on the Nolin River marks part of the southern border of the county. It has a normal pool elevation of 515 feet and a flood-pool elevation of 560 feet. Leitchfield, the county seat, has an elevation at the courthouse of approximately 750 feet. The elevations of other communities are Big Clifty, 752 feet; Caneyville, 490 feet; Clarkson, 730 feet; Millerstown, 589 feet; Millwood, 673 feet; Peonia, 778 feet; Shrewsbury, 660 feet; and Spring Lick, 460 feet." *Information sourced from http://www.uky.edu/KGS/water/library/gwatlas/Grayson/Topography.htm*

B. Environmental Resources

The only component of this project is the rehabilitation of the Salt River Pump Station. All work is on the existing pump station site owned by the GCWD and the highway bore and water main to connect the station to the system is on right of way. Since all the project is at the Salt River pump station site and on right of way few

adverse environmental impacts are anticipated. No known historic sites are noted at this site.

C. Growth Areas and Population Trends

A quick review of the census information shows a consistent increase in the population over the last forty years. Since the establishment of the GCWD, the population of Grayson County has continued to grow at roughly 1.12% per year, with the largest growth in the 1970s and 1990s. The GCWD has outpaced population growth with an average growth of 7.9% over roughly the same period. In large part by expanding the service area of the District through capital improvement projects. The population projections for Grayson County are shown below.

Population:

1970	1980	1990	2000	2010	2020* Est
16,445	20,854	21,050	24,053	25,746	28,800

III. EXISTING FACILITIES

A. Location Map

A map of the county showing the location of the Salt River Pump Station is located at the end of this report.

B. History

The GCWD system was originally formed in the mid 1970's. Originally GCWD purchased all its water from the City of Leitchfield, Kentucky. Numerous water line extension and infrastructure projects have been developed over the past 40 years to establish the current GCWD customer base which serves approximately 98% of Grayson County. This includes the construction of GCWD's own Water Treatment Plant facility capable of producing 2.1 MGD of treated water to its customers.

C. Condition of Facilities

GCWD currently purchases an average of 550,000 to 900,000 gallons a day from the Leitchfield Utilities. However, recent water quality issues with purchased water have been unsatisfactory and unacceptable. This has forced GCWD to investigate and pursue options on improving distribution of water from its own plant. The WTP has ample capacity to replace purchased water with the construction of key East/West interconnects with GCWD's system. The rehabilitation of the Salt River Pump Station is a key component of the GCWD's future ability to serve more of its customer base with water produced at its own WTP. The existing pump station is approximately 25 years old. It operates an average of 19.5 hours per day.

D. Financial Status

As with most utilities across the country, the GCWD continues to see operating expenses rise. Major contributing factors include fuel, pension, and health insurance expenses. These tend to be the expenses that have seen the largest increase over recent years. Because the GCWD 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 consists of:

Rehabilitation of the Salt River pump station; VFD's will be installed to assist with energy efficiency. The Station will be designed to be fed from either of two sources, meaning if one source in unavailable the other can be used with no interruption in service. Rehabilitation will involve the construction of a new above ground pump station. The existing pump station is below ground and dangerous to operators entering the confined space.

B. System O&M

The proposed project will enable the GCWD to move more water to existing customers and to be in a position to move more customers over to water treated at its WTP after the completion of the East/West Connector Phase 2 project in the future. The Station will have the ability to move water from either source in the event of any type of interruption. The existing Salt River pump station has been in service approximately 25 years. It needs major rehabilitation to serve GCWD for another 25 years. The Salt River pump station averages pumping approximately 297 GPM; with VFD's it is estimated that the station could pump up to a maximum of 700 GPM. Currently, the monthly electric expense for the station is an average of $341.24. The District would expect a savings of fifteen percent (15%) with the VFD's.

V. ALTERNATIVES CONSIDERED

Possible alternatives for the rehabilitation of the Salt River Pump Station include:

1. Do Nothing – continue working with the restrictions of the pump station.
2. Rebuild the pump station within the existing structure. This would be still underground and would limit the size of the pump and motors due to their physical size.
3. Construct a new pump station at an alternate site. This would require additional water line work and a higher class of pipe.

Should there be funds remaining after the bidding of the project, GCWD would consider the following additions to the project:

1. Replacement of the High Service Pumps at the WTP
2. UV Disinfection Redundancy at the WTP
3. Expansion of their telemetry system

VI. PROPOSED ALTERNATIVE

The proposed project consists of:

- Rehabilitation of the Salt River pump station and installation of VFD's. Relocating the entire facility to an above ground structure with larger motors; allowing the GCWD to pump more water more efficiently.
- Construction of a highway bore and approximately 60 linear feet of 12-inch water main from the Salt River Pump Station.
- Upgrade of telemetry/SCADA at the Salt River Pump Station

The total project cost is shown on the detailed Preliminary Project Cost Estimate located at the end of the report. The project has been designed and is currently at the Kentucky Division of Water for approval.

It is expected that the GCWD will not require a rate increase with this project. This because the GCWD will be paying off a Kentucky Rural Water Finance loan in 2021 around the same time that this project will be completed.

VII. PROPOSED PROJECT SCHEDULE

The proposed project schedule is:

1. RD Application Submittal	July 2020
2. Environmental Review	August 2020
3. Advertise for Bids	October 2020
4. Contract Award/Initiate Construction	November 2020
5. Substantial Completion	April 2021
6. Final Completion/Initiation of Operation	May 2021

KENTUCKY ENGINEERING GROUP, PLLC

Preliminary Project Cost Estimate

Project : Grayson County Water District
East- West Interconnect Project - Phase 2
Contract No. 4 - Salt River Water Pumping Station

Date : 07/08/20 **Job No. :** 19019
Revised : **Est. By:** RET

ITEM NO.	SUMMARY OF: Contract No. 4 - Salt River Water Pumping Station	QUANTITY NO. OF UNITS	UNIT MEAS.	COST PER UNIT		TOTAL COST
1	Built-In-Place Water Pumping Station	1	LS	$ 400,000.00		$ 400,000.00
2	Highway Bore w/20" Steel Casing Pipe	40	LF	$ 300.00		$ 12,000.00
3	12" Class 250, SDR 17 PVC Water Main	60	LF	$ 50.00		$ 3,000.00
4	12" PVC Water Main Cap w/Concrete Blocking	1	LS	$ 2,500.00		$ 2,500.00
5	Telemetry/SCADA	1	LS	$ 12,500.00		$ 12,500.00
	SUBTOTAL AMOUNT					$ 430,000.00
	10% CONST. CONTINGENCY					$ 43,000.00
	ENGINEERING DESIGN		10.58%			$ 45,490.00
	RESIDENT INSPECTION		7.82%			$ 33,600.00
	LEGAL AND ADMINISTRATION					$ 5,000.00
	PRELIMINARY ENGINEERING REPORT					$ 7,500.00
	ENVIRONMENTAL					$ 2,500.00
	TOTAL ESTIMATED CONSTRUCTION COST					$ 567,090.00

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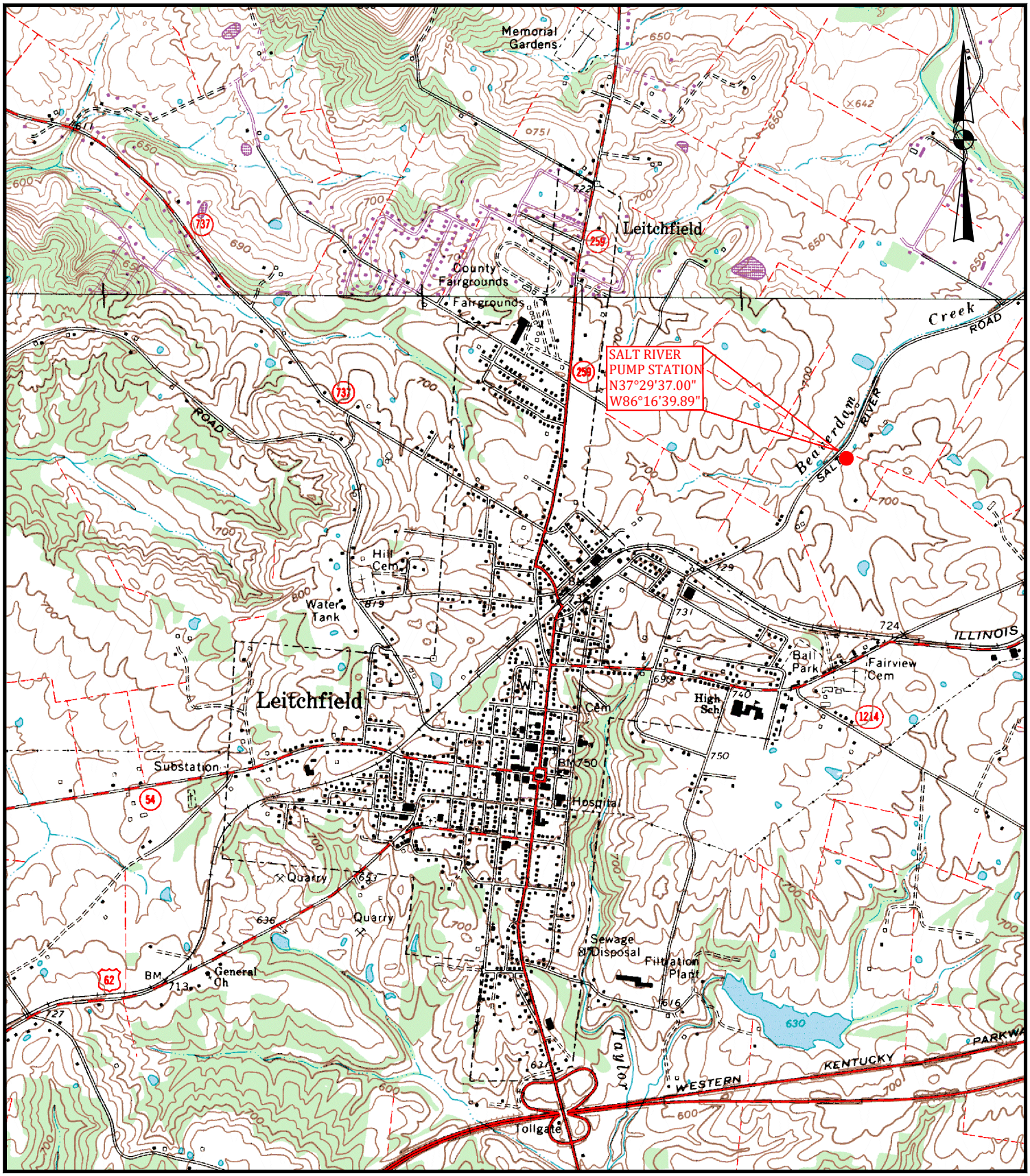

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SALT RIVER PUMP STATION

FOR THE
GRAYSON COUNTY WATER ASSOCIATION
GRAYSON COUNTY, KENTUCKY

Project No.	19019
Date	MAY 2020
Dwg. No.	
Sheet	USGS1