

**GRAYSON COUNTY WATER DISTRICT
PRELIMINARY ENGINEERING REPORT
EAST/WEST INTERCONNECT PROJECT - PHASE 2**

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 3,150 gallons per month at a cost of \$34.32. 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 major components of this project involve improvements to the water treatment plant, replacing existing lines and looping of lines and extending one new line. Since much of the project is at the water treatment plant and on existing facilities few adverse environmental impacts are anticipated. No known historic sites are noted at this time in the planning area.

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 extent of the water system 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.

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 to upgrade the existing water distribution system will help to improve overall water quality for residents in these particular areas. Due to previous water quality issues with the purchased water these improvements will provide residents in the eastern area of Grayson County water from the District's water treatment plant as opposed to the District purchasing water from the City of Leitchfield. These improvements will ensure residents will be provided with safe/reliable drinking water. The proposed project will help to improve the overall service from a water quality and reliability standpoint to the GCWD customers. Improvements at the water treatment plant will address regulatory compliance and operator safety.

The proposed project consists of:

- Upgrade high service pumps
- Add a 3rd GAC vessel
- The 40% of its customer base that relies on water from the City of Leitchfield will be changed over to water from the GCWD WTP. This will eliminate the chronic problem with THM's with the City's water.
- Water lines will be replaced or constructed on: Salt River Road – due to the existing line being too small for the demand; KY 259 North – necessary to make connection with GCWD water source; Duff Road – due to the existing line being too small for the demand; Bypass – new line to serve currently unserved area; and cross country – new line to make connection to the GCWD water source.
- Looping of water lines to improve water quality on KY 259, Bypass, and cross country from KY 259 North to KY 54.
- Installation of security fencing at the WTP and installation of security cameras and a radio intercom at the WTP.

B. System O&M

The proposed project will enable the GCWD to move all its customers over to its water instead of purchasing water from Leitchfield which has had THM problems that have not been resolved. The water lines to be replaced and looped are necessary to make connections with the GCWD water connection, replace too small line for demand and improve water quality.

V. ALTERNATIVES CONSIDERED

The only alternative for the interconnect project Phase 2 is no change to the current distribution system. There are approximately 40 percent of the GCWD customer base that are currently served by Leitchfield Utilities. These improvements are needed to move them to the GCWD WTP source.

VI. PROPOSED ALTERNATIVE

The proposed project consists of:

- Upgrade high service pumps
- Add a 3rd GAC vessel
- Change over the remaining 40 percent of the customers to GCWD water.
- Water lines will be replaced or constructed on: Salt River Road, KY 259 North, Duff Road and cross country from KY 259 North to KY 54.
- Installation of security fencing at the WTP and installation of security cameras and a radio intercom at the WTP.

Mapping of these locations are included on attached exhibits to this report.

The total project cost is shown on the detailed Preliminary Project Cost Estimate located at the end of the report.

It is expected that the GCWA will not institute a rate increase with this project.

VII. PROPOSED PROJECT SCHEDULE

The proposed project schedule is:

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| 1. Environmental Review | April 1, 2021 |
| 2. Secure Land/Easement/Encroachment Permits | June 1, 2021 |
| 3. Advertise for Bids (multiple contracts) | June 1, 2021 |
| 4. Contract Award/Initiate Construction | September 1, 2021 |
| 5. Substantial Completion | August 1, 2022 |
| 6. Final Completion/Initiation of Operation | October 1, 2022 |