



September 29, 2017

Hon. Kevin Neal, Judge Executive
Marshall County Fiscal Court
1101 Main Street
Benton, KY 42025

**Re: Engineering Services Proposal
Oak Level Water System Field Evaluation Services
Benton, Marshall County, KY**

Judge Neal:

Thank you for the opportunity to prepare this engineering services proposal for yours and the Fiscal Court's review. In preparing this proposal, RIVERCREST Engineering, Inc. (RIVERCREST) has reviewed the project history, mapping, and data collected by our staff since our research began on the project earlier this year. The following provides an outline of the engineering field services and associated fees proposed for the field evaluation/investigations for the Oak Level Tank project.

BACKGROUND

Earlier this year, RIVERCREST completed a baseline hydraulic evaluation study for the City of Benton's water system, combined with the Oak Level water transmission and storage tank improvements projects. This evaluation included an evaluation of Benton's water system both prior to, and following the installation of the improvements completed from 2008 to 2012. For this effort, RIVERCREST staff prepared a hydraulic model, using a water modeling software package called InfoWater, developed by InnoVize, which runs on top of the ArcGIS platform. Upon completion of the base model, our staff met with representatives of the City's water system to discuss known system pressures and flow demands throughout the system. This information was used to qualify the results of our computer model versus field measured data.

As a result of RIVERCREST's evaluations, we discovered water system inefficiencies west of the new hospital complex along KY 348 (Symsonia Highway) and KY 408 (Oak Level Road). In general, we identified multiple areas within this western portion of the water system where the field measured pressures varied by as much as 40-psi from the model. Based on these results, we have concluded that conditions exist within the existing infrastructure that are causing lower system pressures to occur. As a result, water flows are being impeded to the new water tank site, which are hindering the water systems' capacity to serve customers and to fill the tank.

PROPOSED SCOPE OF WORK

As previously discussed, we have reviewed available record drawings for the West Marshall Water system and Benton's water system west of the Parkway. Based on these reviews, RIVERCREST has prepared system planning and evaluation mapping, indicating the locations of known system hydrants, isolation valves, air relief valves, and the new Oak Level tank. This mapping will be used as the basis for the field evaluations described below. The purpose and scope of this field study will be to locate and operate all system valves, check and monitor pressures at system hydrants, check and monitor pressures

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at the Oak Level tank location, and locate/exercise air relief valves within the system. RIVERCREST's engineering staff will be on site, periodically, to assist with the initiating of field work and for system trouble-shooting, as needed.

Our approach to this evaluation would generally flow in this fashion:

- 1) Beginning just north of the hospital on Old Symsonia Road and working west to Lynn Nelson Road
 - 2) Lynn Nelson Road from Symsonia Hwy to Oak Level
 - 3) Ivey Road from Symsonia Hwy to Oak Level
 - 4) West on Symsonia Hwy from Lynn Nelson to Arant Road
 - 5) West on Oak Level from Lynn Nelson to new Tank
- A) RIVERCREST field staff will team with a member of City of Benton water staff to check the static water pressures (using City supplied pressure gauges) at each known hydrant location (including the new tank location) to establish a baseline for system pressures and to check for noticeable pressure drops, which may indicate water line restrictions (i.e. air pockets, main breaks, partially closed valves, etc.) System water demands will impact the data collected, so we will log all testing times and try to replicate these for follow up testing.
- B) RIVERCREST field staff will team with City of Benton water staff to review/inspect the former water booster pump station location and old West Marshall Meter pit location (near Lynn Nelson Road). The purpose of these inspections will be to evaluate water flow and pressures thru these areas to check for line restrictions (primarily from line size changes associated with line bypasses and typical meter installation practices).
- C) RIVERCREST field staff will team with City of Benton water staff to locate and map system isolation valves and operate to ensure these are in the fully open position – noting all findings. City of Benton staff should operate all valves as it's their system.
- If significant issues or possible issues are noted during each of the tasks performed in "A" thru "C", follow up pressure tests will be performed at the adjacent hydrant locations to check for system impacts resulting from the opening of valves or removal of lines restrictions.
- D) RIVERCREST field staff will team with City of Benton water staff to locate and map system air relief valves. Each valve should be checked for functionality/condition. If the valve is not functional, this will be noted and the valve will be evaluated for replacement or elimination. This work to be performed by a 3rd party contractor under the supervision of City of Benton staff or representative/Rivercrest.
- If issues or system improvements are noted during each of the tasks performed in "D", follow up pressure tests will be performed at the adjacent hydrant locations to check for system impacts resulting from the opening of valves or removal of lines restrictions.

SCHEDULE

RIVERCREST assumes that our field technician will be on site an estimated 6 hours per day (5 days per week), and working directly with City of Benton Water staff to complete the above noted operations. Our schedule for completion of this work assumes that City staff will be available on regular intervals to work with our field technician for the performance of these tasks in a timely manner. Following completion of the noted field services, RIVERCREST's engineering staff will compile and evaluate the data for preparation of a report for the Fiscal Court. The report will include all findings, as well as recommendations for follow up testing and/or remedial action measures. We estimate that the engineering services for the project as described herein can begin immediately, and can be completed on the general timeframe as noted below:

Field Evaluations	4 weeks
Engineering Report of Findings	2 weeks

PROPOSED FEE

Our proposed fee is divided into Hourly work descriptions for the field evaluation and report preparation work as noted below:

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|--|--------------------|
| • Field Evaluations (Est. 125 Hours) | \$9,375.00 |
| • Data Analysis & Report Preparation (Est. 40 hours) | \$4,600.00 |
| Total Estimated Fee | \$13,975.00 |

Once you have had an opportunity to review our proposal, please contact me or Brian to discuss any concerns or questions you may have. If the Court is agreeable to starting this work in accordance with this proposal, please sign below, and return to us. As we are currently working under a professional engineering services agreement with the Marshall County Fiscal Court, we understand that we will continue to operate under this agreement for the duration of this project.

Sincerely,
RIVERCREST ENGINEERING, INC.



Charles D. McCann II, P.E.
Project Manager

APPROVED BY:

Hon. Kevin Neal, Judge Executive
Marshall County Fiscal Court