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To: PWW&SB -John Young

From: Stephen H. King, P.E. BCEE – Associate Vice President

Prichard Water Distribution System Storage Tank Evaluation

The Prichard Water Works and Sewer Board (PWW&SB) requested that Hazen and Sawyer (Hazen) evaluate different alternatives to improve existing tank operations in the water distribution system.

Several of the tanks are due for repairs and rehabilitation, but PWW&SB first wanted to determine if any would need to be replaced for hydraulic reasons or any can be removed without affecting current level of service.

For this evaluation, Hazen used the water distribution model previously calibrated in 2020. This model requires updates to improve its accuracy. However, the model is suitable for conducting a high-level analysis provided further verification is completed before any projects proceed. When evaluating each of the scenarios, a minimum pressure requirement of 40 psi was used. Available fire flow and tank turnover were also considered in each evaluation.

The existing water distribution system is divided into a high-pressure zone (High Zone) in the west and a low-pressure zone (Low Zone) in the east. Both zones are supplied by the Mobile Area Water and Sewer System (MAWSS). The High Zone contains one elevated storage tank, while the Low Zone contains three elevated tanks and one standpipe tank.

Due to the higher supply head coming from the MAWSS supplies to the Low Zone, three of the tanks (with lower overflow level) remain submerged. At times this causes the tanks to overflow, which results in water loss. Also, the inability of water in these tanks to cycle on a regular basis can cause water age issues. Various alternatives were evaluated to resolve these issues, including the addition of pump stations to help force water out of the existing tanks, replacing the existing tanks with larger ground or elevated tanks, and the creation of a new medium pressure zone supplied by Anderson Road tank to allow for better control of system pressure and improve the turnover at the three submerged tanks with a lower supply head in the Low Zone. The evaluation also considered the option of removing one tank as the Low

Zone as this zone has 1MG surplus storage according to a storage analysis of the water distribution system completed in 2020. Per the model results, removing one tank in the Low Zone will have no adverse impact on the system pressure and available fire flow comparing to existing system. In addition to the above alternatives, installation of control valves with SCADA at major supply points is recommended for improved management and control of the supply from MAWSS.

The 2020 storage analysis of the water distribution system showed that the High Zone requires 1 million gallon (MG) of storage to provide equalization for the system, fire flow, and emergency supply. However, the High Zone currently only has 0.25 MG of storage. The proposed solution for the High Zone is to replace the existing elevated tank with a larger tank that would provide the required 1 MG of storage.