Memorandum

To: Dave Corlis., Town Manager

From: Matthew Hayes, P.E., Technical Engineering Manager

Thru: Mark Marlowe, P.E., Director of Castle Rock Water

Roy Gallea, P.E., Engineering Manager
Matthew Hayes, P.E., Technical Engineering Manager

Title: **Update on Artificial Intelligence (AI) Leak Detection, Equipment and Services Acquisition Agreement with Digital Underground Solutions**
[Cobblestone Ranch subdivision]

Executive Summary

The purpose of this memo is to provide Town Council with an update on an equipment and services agreement (***Attachment A***) approved by the Town Manager with Digital Water Solutions for leak detection technology using acoustical loggers installed on fire hydrants. The technology uses the data from the acoustical loggers to identify and locate water leaks in the distribution system. The initial implementation of this technology will be used as a pilot study in the Cobblestone Ranch subdivision. The cost for the initial phase of this project is $89,444 including $79,705 for eight permanent loggers for fire hydrants and $9,739 for software and training. Staff also requested a town managed contingency of $8,900.

History of Past Town Council, Boards & Commissions, or Other Discussions

Castle Rock Water (CRW) staff presented the AI leak detection initiative to CRW Commission on October 30, 2024. CRW Commission was very supportive of the pilot project.

Discussion

Castle Rock Water (CRW) is evaluating the use of AI technology for leak detection. Staff met with several vendors to evaluate their leak detection technology. Each vendor provided a demonstration of the capabilities of their technology. Staff determined that the Digital Water Solutions' solution was the best fit for CRW's goals. The technology uses pressure/acoustic sensors installed on hydrants within the distribution system. These sensors listen for the acoustic signature of leaks in the distribution system. Using multiple sensors, the AI technology can identify the magnitude and location of the leak within tens of feet. These leaks can be identified before they surface and repaired in a proactive manner. This technology will also allow us to incorporate our advanced metering infrastructure (AMI)

and supervisory control and data acquisition (SCADA) data to create district meter zones to track water balances and use within specific areas of the distribution system.

The goal of this software is to help reduce real water loss seen within the distribution system and ultimately capture lost revenue of produced water from these losses. CRW's annual real losses from leaks in our distribution system range from 133.3 million gallons or 409.3 AF to 240.0 million gallons or 736.8 AF over the last five years. The value of this water is $410,770 to $643,070 based on an average sales price of $3.08 per thousand gallons. Reducing these water losses also helps to reduce the amount of water supply CRW has to develop to meet future demands. A rough cost for development of renewable water supplies is $50,000 per acre foot (AF) over and above the lost revenue. Based on the annual losses, this would theoretically result in $20M to $36M in additional renewable water supplies needed to offset these losses. This project will allow CRW to evaluate the potential of this technology for use across the whole distribution system to save water supplies, ensure revenues for all water produced, use the supplies more efficiently, and reduce future water supply purchases.

Staff Recommendation

Staff recommended approval of a services agreement with Digital Water Solutions for AI hydrant leak detection, and the Town Manager approved the agreement. The cost for the first phase of the project is $89,444, plus a 10% Town managed contingency of $8,900 for a total authorization of $98,344. Funds were authorized from the 2024 Distribution System Upgrades Account, 210-4275-442-75-38.

Attachments

Attachment A: Services Agreement –Digital Water Solutions
Attachment B: Location Map