DES MOINES WATER WORKS
Board of Water Works Trustees

Des Moines Water Works
Water You Can Trust for Life

2201 George Flagg Parkway | Des Moines, Iowa 50321-1190 | (515) 283-8700 | www.dmww.com

MEMORANDUM

DATE: May 29, 2020

TO: Ted Corrigan, CEO and General Manager

FROM: Michael J. McCurnin, P.E., Director of Engineering Services

SUBJECT: Gallery Valve Vault Rehabilitation

The gallery system at Des Moines Water Works (DMWW) is an extremely valuable component of the broad water treatment system at the Fleur Drive Water Treatment Plant (FDWTP). It brings value and benefit each and every day it remains in operation. Constructed in sections between 1884 and 1931, the gallery is presently 3 miles in length and runs adjacent to the Raccoon River within Water Works' park. Most elements are 48" in diameter and 24"in length. These pipe sections have been installed to create a horizontal water collection system that ranges in depth between 30' and 40'. Present-day yield from the system can be as high as 30 million gallons per day.

Until the mid-1900s, the gallery was the sole source of raw water for the FDWTP and the community it served. River water and groundwater both flow naturally into the gallery pipe sections. Conveniently, the sands and gravels that comprise the river alluvium naturally filter the water before it enters the piping system. This natural filtration certainly brought initial benefit to the community as the treatment plant had limited treatment techniques (no pre-sedimentation, no softening, and no filtration) in the early 1900s. More than one hundred years later, the gallery continues to provide substantial benefit as the riverbank filtration process helps provide a source of water with superior water quality characteristics relative to our direct surface water sources. Our predecessors were clearly aware that the gallery system was a positive addition to the treatment works, but it is difficult to imagine they could have understood the gallery's role in meeting present-day water regulations. The enhanced water quality and the power of blending raw water sources makes the gallery an integral tool in meeting present-day regulatory requirements. On a daily basis, water treatment operators maximize the yield from the gallery in an effort to improve finished water quality. Without the gallery, immediate reconstruction of gallery elements or integration of enhanced treatment technologies would likely be required to meet today's drinking water standards.

Nearly five years ago DMWW staff obtained a quotation to effectively televise and inspect the gallery piping. There is interest in confirming that there are no obstruction or pipe section failures throughout the three-mile span of the system. The inspection was unable to be

completed as staff found a number of inoperable valves and structural concerns with the valve-vault structures. Staff and the vendor could not safely enter and isolate the gallery and perform the condition assessment activities.

Capital funding has been established to begin to rehabilitate the valve-vault structures. Funding for 2020 should allow three or four valve-vault structures to be rehabilitated. Substantial inspection efforts have occurred over the past 18 months and completion of design drawings is slated for the summer of 2020. Engineering staff has determined the structural modifications and improvements that are needed to restore the vaults. Engineering and Water Production staff will refine the top-side design elements (water measurement access, valve access & repair, and flood resistance) over the next several weeks. There are twelve valve-vaults in total and approximately eight are in need of rehabilitation. Restoration of the initial three or four valve-vault structures in 2020 will pave the way for future funding and restoration of the remaining vaults in 2021 (ideally).

With robust valve-vault structures in place, coordinating the needed valve repairs and completing the originally intended condition assessment will follow.