Santa Clara Valley Water District

File No.: 21-0767

Agenda Date: 7/13/2021
Item No.: 5.2.

BOARD AGENDA MEMORANDUM

SUBJECT:
Receive an Update on the Condition of the Almaden Valley Pipeline.

RECOMMENDATION:
Receive an Update on the Condition of the Almaden Valley Pipeline.

SUMMARY:
The Almaden Valley Pipeline (AVP) consists of approximately 12 miles of 72-inch to 78-inch diameter Prestressed Concrete Cylinder Pipe (PCCP) and Welded Steel Pipe (WSP). The pipeline was constructed in three (3) segments: Unit I (4.4 miles) was constructed in the 1960's, and Unit II Phase I (3.5 miles) and Unit II Phase II (3.7 miles) were constructed in the 1980's. The AVP is used to supply raw water from the Central Valley Project to Santa Clara Valley Water District's (Valley Water) water treatment plants and groundwater recharge facilities.

During the April 27, 2017 Board meeting, the Board authorized the sole source procurement of PCCP Electromagnetic (EM) inspection and Acoustic Fiber Optic (AFO) monitoring condition assessment equipment and services.

When the pipelines are shut down for maintenance and rehabilitation, the EM inspection technology is used internally to scan the structural components of PCCP for broken prestressing wires. The resulting data forms the baseline for PCCP condition assessment. Once the pipelines are returned to service, the AFO system continually monitors, records, reports, and tracks the prestressing wire break events in PCCP pipelines twenty-four (24) hours a day, seven (7) days a week. The EM Inspection and daily AFO prestressing wire break data are used to assess and update the current condition of the PCCP.

During the September 22, 2017 Board meeting, the Board awarded the AVP Inspection and Rehabilitation Project to Con-Quest Contractors, Inc. An EM inspection was conducted in conjunction with the Project. The EM Inspection revealed a substantial number of distressed PCCP pieces sporadically dispersed throughout the 3.7-mile Unit II Phase II portion of AVP.

On December 5, 2017, the Chief Executive Officer (CEO) declared an emergency to repair the severely distressed PCCP in AVP. Eighty (80) PCCP pieces dispersed throughout the Unit II Phase II

portion of AVP were repaired using internal Carbon Fiber Reinforcement and one (1) PCCP piece was repaired using external Post-Tensioning. In total, approximately 0.4 miles of PCCP in the 3.7-mile Unit II Phase II portion of the AVP were repaired during this emergency action.

Extensive investigation and material testing were conducted on one (1) severely distressed PCCP piece and two (2) non-distressed PCCP pieces. Staff and its consultants and contractors removed the cement mortar coating from the severely distressed PCCP piece and physically counted all of the broken prestressing wires. Prestressing wire samples from the two (2) non-distressed PCCP pieces were taken for comparative material testing and analysis. The investigation and material testing and analysis confirmed the EM inspection prestressing wire break results and the hydrogen embrittlement determination. The investigated distressed PCCP piece was subsequently repaired using external Post-Tensioning. AVP was returned to service on March 16, 2018.

An AFO system was installed as a part of the AVP Inspection and Rehabilitation Project to monitor the in-service condition of the PCCP. The data from the AFO system indicated that the PCCP in the Unit II Phase II portion of AVP continued to degrade.

On December 23, 2019, the CEO declared another emergency to repair some PCCP pieces that had become severely distressed since the original emergency. Staff and its consultants conducted another EM inspection of the PCCP pieces under consideration and confirmed the AFO system prestressing wire break data. Five (5) additional PCCP pieces were repaired using internal Carbon Fiber Reinforcement during this emergency action. AVP was returned to service on February 27, 2020.

Staff and its consultants continue to monitor and assess the condition of AVP based on the AFO prestressing wire break data. The data from the AFO system continues to indicate that the PCCP in the Unit II Phase II portion of AVP continues to degrade and that additional PCCP pieces are approaching the severely distressed condition.

Considering the vital nature of AVP, staff are preparing to address the PCCP pieces that are approaching the severely distressed condition during the 2021 November to December low water supply demand timeframe, should the need arise. In addition, Water Utility Capital staff 1) are planning a Fiscal Year 2023 AVP Inspection and Repair Project to inspect the Carbon Fiber Reinforcement in accordance with the manufacturer's recommendations and to address any concerning PCCP pieces and 2) have initiated the Planning Phase for the AVP Replacement Project to address the long term reliability of the AVP.

FINANCIAL IMPACT:
There is no financial impact associated with this item.

CEQA:
The recommended action does not constitute a project under CEQA because it does not have a potential for resulting in direct or reasonably foreseeable indirect physical change in the environment.

ATTACHMENTS:
Attachment 1: PowerPoint

UNCLASSIFIED MANAGER:
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