

CRESCENTA VALLEY WATER DISTRICT

2700 FOOTHILL BOULEVARD
LA CRESCENTA, CALIFORNIA

Agenda for the Meeting of the Engineering Committee
of the Crescenta Valley Water District

To be held on

July 12, 2019 at 9:00 AM

Posted July 11, 2019 at 9:00 AM

Call to Order

Adoption of Agenda

Information Items

1. Status of Groundwater Wells and Well Capacity
2. FY 19/20 – Capital Improvement Project (CIP) Program
3. Sanitary Sewer Overflow Plan (SSMP) – 2019 Review
4. Crescenta Valley High School (CVHS) – Water Loss
5. Proposals for Hydraulic Modeling Update

Public Comments

At this time, members of the public shall have an opportunity to address the Committee on items of interest that are within the subject matter jurisdiction of this Committee. This opportunity is non-transferable and speakers are limited to three (3) minutes each.

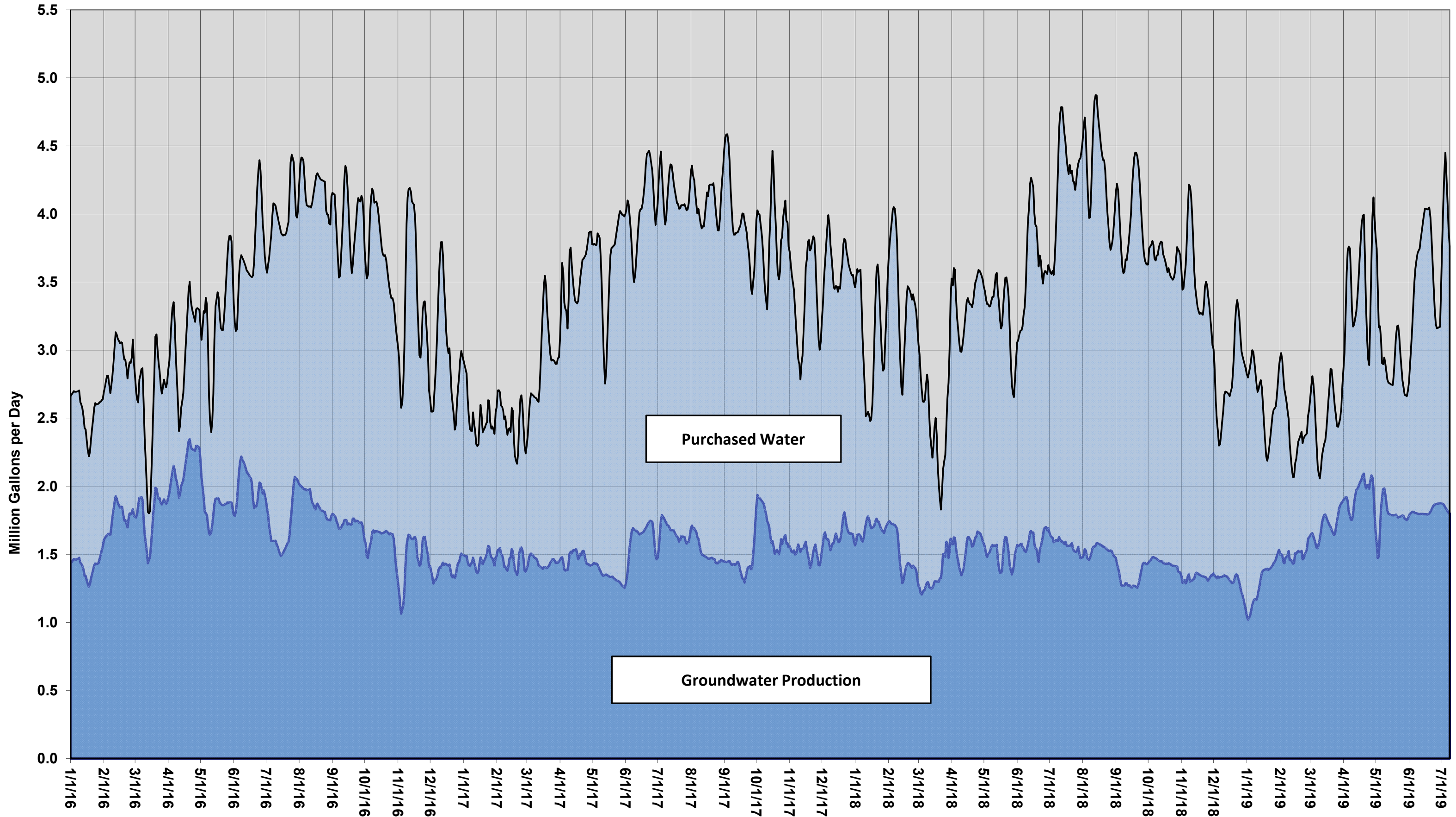
Committee Member's Request for Future Agenda Items

Next Engineering Committee Meeting – August 23, 2019

Adjournment

Water Production Chart 2016 - 2019

■ Groundwater Production (MGD) ■ Total Water (MGD)



CRESCENTA VALLEY WATER DISTRICT

STAFF REPORT

Information Item No. 2
July 12, 2019

To: Engineering Committee
From: David S. Gould, P.E. – District Engineer
Subject: FY 19/20 Capital Improvement Project (CIP) Program

DISCUSSION:

A board workshop was held on May 21, 2019 where staff and the Board reviewed the proposed CIP program for FY 19/20, which is shown below and included in the final budget:

Capital Improvement Project Program Project Name	Budget FY 19/20	Project Description
Well Rehabilitation	\$190,000	Well Rehabilitation - Well 11 & 14
Reservoir Rehabilitation	\$410,000	Reservoir Rehabilitation - Markridge Reservoir
Annual Pipeline Replacement	\$1,056,000	Pipeline Replacement - 3200 & 3300 Blocks of Brookhill & 2400 & 2500 Block of Janet Lee
Annual Booster Pump Replacement	\$75,000	Replace vertical turbine pumps - Glenwood Plant
Rehabilitation of Ramsdell/Mayfield Blending Station	\$165,000	Install new Pressure Reducing Station - Zone 2 to Zone 1
SCADA Replacement - Equipment & Integration	\$315,000	Replacement of SCADA System - Replacement, programing, integration and testing of RTU/PLC equipment
Advanced Metering Infrastructure (AMI) Program	\$557,000	Installation of AMI communication network - including programming, integration and testing of selected areas
District Facility Improvements	\$110,000	Williams Reservoir site improvements - Planning and design
Priority A - Total	\$2,878,000	

At the June 25, 2019, the Board directed staff to reduce the CIP by \$1M and slow down the planning of projects until the proposed rate increase was discussed on August 27, 2019. Staff recommended that the design of pipeline and reservoir rehabilitation projects continue such that construction could commence in Fall 2019.

Staff reviewed the FY 19/20 CIP program and put together a preliminary project schedule with estimated costs for the period from June 2019 to September 2019 and from September 2019 to June 2020 as shown below:

Capital Improvement Project Program FY 19/20	Budget FY 19/20 (July - Sept)	Budget FY 19/20 (Sept - June)	Project Schedule
Well 7 Rehabilitation	\$98,240		7/19 Construction; 8/19 Final Payment
Well 11 Rehabilitation		\$95,000	Design 10/19; 1/20 Start Construction
Well 14 Rehabilitation		\$95,000	
Re-Activate Well 2 - Construction		\$66,160	Final Retention; Paid 10/19 or 11/19
Markridge - Reservoir Rehabilitation	\$20,000	\$390,000	7/19 - Design; 11/19 Start Construction
Pipeline - 3200 & 3300 Blocks of Brookhill	\$75,000	\$490,000	Ad for Bid & Material - 8/19; Award - 9/19; Start - 11/19
Pipeline - 2400 & 2500 Block of Janet Lee	\$45,000	\$446,000	Design - 8/19; Award 11/19; Start 1/20
Booster Pump - Glenwood 32 & 33		\$75,000	Design 11/19; Award 12/19; Const - 2/20
Pressure Reducing Station		\$165,000	Design 11/19; Award 12/19; Const - 2/20
Conversion to Chloramination Disinfection	\$85,000		Estimate of invoices to be received in FY 19/20
AMI Communication Network	\$28,900	\$528,100	Design - 7/19; Award 10/19; Construction - 1/20
SCADA RTU Replace	\$35,000	\$280,000	Design - 8/19; Award 11/19; Construction - 2/20
Williams Reservoir Site Improvements		\$110,000	Design/Consultant - Award 9/19; Const - FY 20/21
Capital Improvement Projects - Total	\$387,140	\$2,740,260	
Revised Total with FY 18/19 Projects to be invoiced in FY 19/20		\$3,127,400	
Approved FY 19/20 CIP Budget		\$2,878,000	
Difference		\$249,400	

Please note that there are three (3) projects (Well 7, Well 2 & Chloramine Conversion) from FY 18/19 will have invoices submitted after July 1 and will be included in the FY 19/20 budget. The amount shown above will also be deducted from the final FY 18/19 CIP budget, which will increase the water reserve fund that will be carried over to FY 19/20.

FY 19/20 Administration Consultants – Engineering Department

Staff proposed the following projects under the administration consultant expense account to assist the Engineering Department including upgrading the GIS data, assistance for researching and applying for federal, state and local grants, a preliminary assessment towards an asset management plan and updating CVWD's hydraulic model. At the June 25, 2019, the Board approved the FY 19/20 budget that included these projects.

FY 19/20 Administration Consultants						
Project Name	Water	Sewer	Total	% Water	% WW	Comments
GIS - Update	\$5,000	\$5,000	\$10,000	50%	50%	GIS Consultant to assist with CVWD's GIS Program
Annual On-Call Grant Assistance	\$30,000	\$10,000	\$40,000	75%	25%	Annual On-Call Grant Assistance
AMP: Assessment Management - Preliminary Assessment Study	\$22,500	\$7,500	\$30,000	75%	25%	<u>Facilities Maintenance Plan</u> : Consultant to provide a preliminary assessment of CVWD's Assets
WMP: Update Hydraulic Model	\$75,000	\$0	\$75,000	100%	0%	<u>Water Master Plan</u> : - Consultant to Update Hydraulic Model from 2004
Total	\$132,500	\$22,500	\$155,000	85%	15%	

Staff reviewed the FY 19/20 administration consultants' budget and put together a preliminary project schedule with estimated costs for the period from June 2019 to September 2019 and from September 2019 to June 2020 as shown below:

Project Name	Water	Sewer	Total	Budget FY 19/20 (July - Sept)	Budget FY 19/20 (Sept - June)	Project Schedule
GIS - Update	\$5,000	\$5,000	\$10,000	\$2,500	\$7,500	GIS Upgrades - 7/19 to 12/19
Annual On-Call Grant Assistance	\$30,000	\$10,000	\$40,000	\$4,500	\$35,500	Continue Grant Assistance - \$1,500/mo
AMP: Assessment Management - Preliminary Assessment Study	\$22,500	\$7,500	\$30,000	\$0	\$30,000	RFP - 10/19; Award 11/19; Complete - 4/20
WMP: Update Hydraulic Model	\$75,000	\$0	\$75,000	\$6,000	\$69,000	Award 7/19; 20% complete - 10/19; Complete - 3/20
Total	\$132,500	\$22,500	\$155,000	\$13,000	\$142,000	

RECOMMENDATION:

It is staff's recommendation to proceed with the proposed project schedule and costs until the final rate increase is approved by the board on August 27, 2019.

Prepared & Submitted by:



David S. Gould, P.E.
District Engineer

CRESCENTA VALLEY WATER DISTRICT

STAFF REPORT

Information Item No. 3
July 12, 2019

To: Engineering Committee
From: David S. Gould, P.E. – District Engineer
Subject: Discussion of the District's 2019 Updated Sewer System Management Plan (SSMP)

INFORMATION ITEM:

Review of 2019 Updated Sewer System Management Plan – Review of the 2019 updated sewer system management plan

BACKGROUND

On May 2, 2006, the State Water Resources Control Board (SWRCB) adopted Order No. 2006-003 which established the General Waste Discharge Requirements (WDRs) for all publicly owned or operated sewer systems within California. The WDRs require that the owners and operators of a sewer system perform the following:

1. Report Sanitary Sewer Overflows (SSOs) to the SWRCB.
 2. Develop and implement a Sewer System Management Plan (SSMP), which is a written document detailing how the District's sewer system is operated, inspected, maintained, repaired, and funded.
 3. Submit a completed Sewer System Management Plan for approval and certified by the governing agency by August 2, 2009.
- 2009 - Staff completed CVWD's SSMP and the plan was approved by the CVWD Board of Directors. This requirement was put into place to ensure that the governing board is aware of the SSMP program and the potential impacts to the District, such as budget needs and updating CVWD's Rules & Regulations.
 - 2012 - Staff performed an internal audit and updated the SSMP. Appendices pertaining to existing wastewater conveyance and treatment agreements between CVWD and the City of La Canada-Flintridge and the City of Glendale were removed and included as reference. A summary of these changes can be found in the attached 2019 revisions summary.
 - 2013 - In 2008, SWRCB released draft changes to the monitoring and reporting requirements of the WDRs. After implementation of the original WDRs, SWRCB found that there were inconsistencies in the original order, and the current system resulted in far too many SSOs being reported to the California Office of Emergency Service (COES). Water quality sampling information was added to the emergency response plan as well as information on how to develop a technical report for submittal to SWRCB after a large volume spill, larger than 50,000 gallons. These draft changes took effect in 2013 as part of an update to the Monitoring and Reporting Program for the WDR.
 - 2014 - Staff updated the SSMP to reflect changes to the WDR made in 2013. The 2014 SSMP was re-certified and approved by the Board on July 15, 2019. Also, in 2014, the SWRCB has released enforcement criteria for the WDR, but this required no major changes to the SSMP. A summary of these changes can be found in the attached 2019 revisions summary.
 - 2016 - Staff performed an internal audit SSMP in November of 2016 with slight adjustments to our inspection schedule. Staff also made updates to maps, organizational charts, and the design manual to better reflect the procedures occurring in the field. A summary of these changes can be found in the attached 2019 revisions summary.

Since the audit in 2016, there have been no sewer spill overflows or substantive changes to the WDR by SCWRB. CVWD has purchased a new Vactor truck in 2017 for cleaning operations and began employing a new alternative treatment method for root removal. Staff training requirements were adjust to reflect the new Vactor truck.

CVWD has seen a sharp reduction in sewer spill overflows and in the past five (5) years there has only been one sewer spill overflow event, which was associated with the malfunction of a private grease interceptor. The spill occurred in September 2016 and after staff completed the reporting for this spill it was determined that the emergency response protocol in the SSMP was up-to-date and sufficient.

DISCUSSION:

In 2019, Staff reviewed the SSMP and updated Sections 4, 5, 6 and 8 to better represent CVWD's office and field practices. A summary of these changes can be found in the attached 2019 revisions summary. For CVWD to stay in compliance with the WDR, re-certification of the SSMP must be approved by August 2, 2019.

SUMMARY

It is the recommendation of staff that the Engineering Committee reviews the changes to the 2019 SSMP and provides the Board of Directors with guidance on certifying the document at the Board Meeting on July 23, 2019.

Prepared by:

Submitted by:

Brook Yared, P.E.
Senior Engineer

David S. Gould, P.E.
District Engineer

Attachments: 2019 Summary of Changes

g:\engineering committee\2019 ec memo\07-12-19 ecm memo - 2019 ssmp certification.docx

CRESCENTA VALLEY WATER DISTRICT

STAFF REPORT

Information Item No. 4

July 12, 2019

To: Engineering Committee
From: David S. Gould, P.E. – District Engineer
Subject: Discussion of Unauthorized Water Use at Crescenta Valley High School

INFORMATION ITEM:

Unauthorized Water Use at Crescenta Valley High School (CVHS) – Discussion regarding the recent discovery of unauthorized water use at CVHS by the Glendale Unified School District

BACKGROUND:

CVWD staff has been in talks with Glendale Unified School District (GUSD) regarding the installation of a sewer lateral for the new Sports Medicine Building at CVHS over the past several months. While walking the job site, CVWD's inspector, Cory Whitman, came across a backflow device that was connected to CVWD's 6-inch water main that runs inside the CVHS property without a water meter. After some discussion with Mr. Jeff Bohn, GUSD's Project Manager, it was revealed that a previous contractor had installed a 4-inch irrigation service for the football field between 2005 and 2006. Staff indicated to Mr. Bohn that this connection was illegal and considered a theft of water by CVWD.

DISCUSSION:

In accordance with CVWD's water theft policy (see attached), staff undertook an investigation into the illegal connection to determine if this connection resulted in damages to the District for the lost water. Staff requested construction plans (if any) showing the illegal connection, how long it has been in use, what is the water being used for (i.e. drinking fountains, irrigation, bathrooms etc.), the pipe material and any other information necessary for the investigation.

Mr. Bohn did provide construction plans and indicated that the water connection is used only to irrigate the football field one (1) week out of the year, however, he did not provide any supporting documentation for this.

Staff has been looking at several assumptions and methods on how to proceed with recuperating the cost of unaccountable water from GUSD as shown on the attached table and for review with the Engineering Committee.

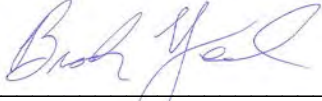
1. Determine the start date of the unauthorized water use:
 - o Assumed a starting date of January 1, 2006 considering the construction plans provided were finalized in October 2005.
2. Estimate the amount of water used during the period from January 1, 2006 to July 1, 2019:
 - o Annual Water Use based on irrigation plans, number of sprinkler heads, gpm per sprinkler heads, estimated time is use of 20 minutes per day for one irrigation cycle, and irrigation system used an average of 4 days per week.
 - o Estimated 52.3 units of water (53,200 gals) per bi-monthly billing cycle. The estimated amount of unauthorized water use for the 13.5 year period is 4,701 units or 4.7MG.
 - o Assumed the irrigation system used a 4-inch meter.
3. Estimate annual cost of water and service charge for each year based on rate increases, changes in rate structure and changes in irrigation tier rate structure.
4. Staff prepared a cost estimate for all labor and materials associated with all work to rectify the situation as shown in the attached table.

Staff's estimate for recuperating the cost of unaccountable water from GUSD is \$65,071.39.

RECOMMENDATION:

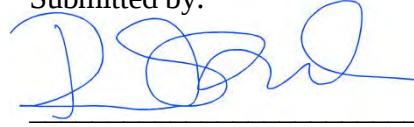
Staff requests guidance from the Engineering Committee on finalizing the estimate for the cost for unaccountable water from GUSD and presenting the estimate to the Board of Directors.

Prepared by:



Brook Yared, P.E.
Senior Engineer

Submitted by:



David S. Gould, P.E.
District Engineer

Attachments:

1. CVWD's Water Theft Policy
2. Summary Table for the Cost of Unaccountable Water
3. GUSD Irrigation Construction Plans

g:\engineering committee\2019 ec memo\07-12-19 ecm - glendale area unified schools - unauthorized water use.docx

CRESCENTA VALLEY WATER DISTRICT WATER THEFT POLICY

UNAUTHORIZED USE OF WATER SERVICES OR FIRE HYDRANTS

Tampering with any water service or fire hydrant for the unauthorized use of water, or any other reason, is a misdemeanor as provided by California Penal Code Sections 148.4 and 498. Such actions are punishable by imprisonment, a fine, or both. The District reserves the right to prosecute any such actions to the fullest extent of the law.

POLICY

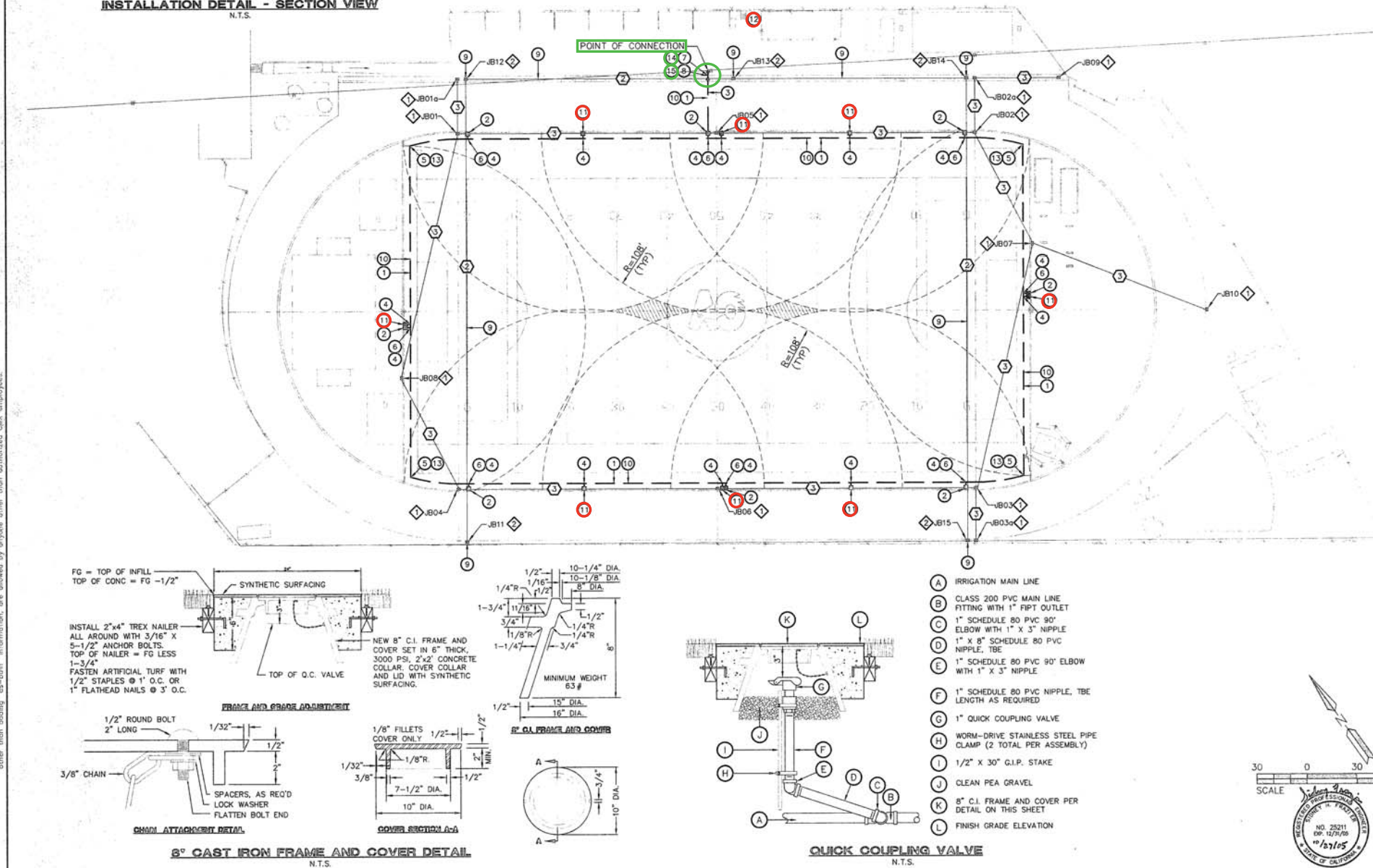
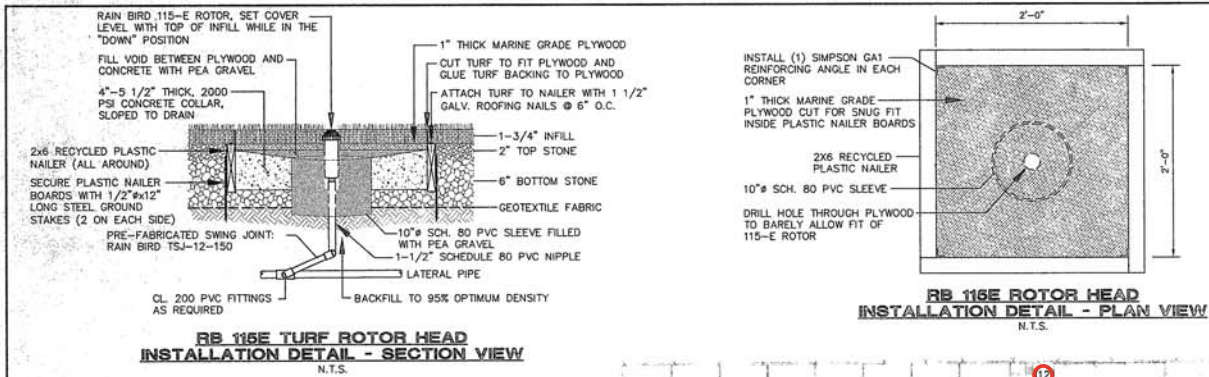
1. Upon complaint or discovery of possible water theft, District staff shall investigate and submit a report of findings to the District's Board of Directors. Any devices used to illegally remove water from the distribution system shall be confiscated and kept by the District.
2. District staff shall begin a formal investigation to determine if damages have resulted based on the water theft and/or the tampering of the water service or fire hydrant.
3. Fines for tampering with and/or damaging a water service or fire hydrant will be assessed as follows:
 - a. First Violation and all Subsequent Violations: \$2,000.00
4. In addition to the fines for tampering, the offender will be billed for all water estimated by District staff to have been withdrawn from the distribution system to be billed at the applicable rate. Staff time and equipment utilized in investigating and performing repairs shall also be included in the billing. The fines and billings must be paid within 15 days of the date of the invoice.
5. In the event of a failure to pay by the offender the District shall use any means necessary to collect, including but not limited to: filing a lien against real property.
6. The District reserves the right to pursue criminal charges where warranted in addition to fines and billed costs associated with the theft.
7. In addition to the initial report to the Board of Directors under Paragraph 1, above, District staff shall continue to update the Board of Directors of the District's actions in handling any incident of water theft.

Crescenta Valley Water District

Estimate of Cost for Unaccountable Water at CVHS

Date **7/12/2019**

[illegible]



- ## IRRIGATION NOTES:
- ① (BID ALTERNATE)
INSTALL 2-1/2" SCHEDULE 40 PVC IRRIGATION LINE WITH SCHEDULE 40 SOLVENT WELD FITTINGS IN LIEU OF 4" CLASS 200 PVC R.R.&G. IRRIGATION MAIN. PROVIDE MINIMUM 24" COVER.
 - ② INSTALL (8 TOTAL) QUICK COUPLER VALVES IN CAST IRON FRAME AND COVERS WITH 2"x2", 6" THICK, 3000 PSI CONCRETE COLLAR PER DETAILS ON THIS SHEET. COVER CAST IRON COVER AND CONCRETE WITH RUBBERIZED SYNTHETIC SURFACING.
 - ③ INSTALL 6" CLASS 200 PVC SLEEVE UNDER AC PAVEMENT AND SYNTHETIC TRACK SURFACING.
 - ④ INSTALL 4"x 4" 4" CLASS 200 PVC R.R.&G. TEE. PROVIDE THRUST BLOCKS AS REQUIRED.
(BID ALTERNATE)
 - ⑤ INSTALL 2-1/2" X 2-1/2" X 90° BEND IN LIEU OF 4" X 4" 90° CLASS 200 PVC R.R.&G. BEND. PROVIDE THRUST BLOCKS AS REQUIRED.
(BID ALTERNATE)
 - ⑥ INSTALL 2 1/2" X 2 1/2" X 2 1/2" TEE IN LIEU OF 4" X 4" 4" CLASS 200 PVC R.R.&G. TEE. PROVIDE THRUST BLOCKS AS REQUIRED.
 - ⑦ (BID ALTERNATE)
INSTALL 6" X 2-1/2" REDUCER.
 - ⑧ (BID ALTERNATE)
INSTALL NEW 2-1/2" GATE VALVE PER DETAIL 03 ON SHEET TF-09.
 - ⑨ (BID ALTERNATE)
INSTALL JB11 THROUGH JB15 AND (2) 2" CONDUITS FOR FUTURE LIGHTING PROJECT.
 - ⑩ INSTALL 4" CLASS 200 PVC R.R.&G. MAIN IRRIGATION LINE.
⑪ INSTALL RAINBIRD 115E ROTOR HEAD PER DETAILS ON THIS SHEET.
⑫ PROVIDE IRRIGATION PUMP STATION TO INCREASE EXISTING PRESSURE TO 100 PSI MINIMUM. PROVIDE CONNECTION TO IRRIGATION MAIN LINE WITH 4" CLASS 200 PVC R.R.&G. IRRIGATION PIPE.
⑬ INSTALL 4" X 4" 90° CLASS 200 PVC R.R.&G. BEND. PROVIDE THRUST BLOCKS AS REQUIRED.
⑭ INSTALL 6" X 4" REDUCER.
⑮ INSTALL NEW 4" GATE VALVE PER DETAIL 03 ON SHEET TF-09.

JUNCTION BOX NOTES:

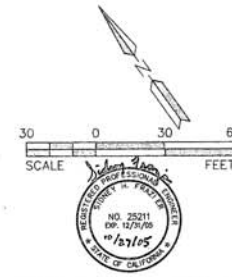
- 1 JUNCTION BOX PER DETAIL 01 ON SHEET TF-11.
2 (BID ALTERNATE)
JUNCTION BOX PER DETAIL 01 ON SHEET TF-11.
- NOTE:
PROVIDE 2" DRAIN PIPE IN EACH JUNCTION BOX.
CONNECT TO STORM DRAIN SYSTEM. SEE
DRAINAGE PLAN SHEET TF-06.
- JB = JUNCTION BOX

CONDUIT KEY:

- ③ = (3)CONDUITS:
(1) 2" ELECTRICAL & (2) 2" OTHER
- ② = (2)CONDUITS: (BID ALTERNATE)
(2) 2" FOR FUTURE LIGHTING PROJECT

GENERAL NOTES:

2. THE IRRIGATION BID ALTERNATE IS TO REMOVE ALL WORK ASSOCIATED WITH THE RAINBIRD 115E ROTOR HEADS. WORK INCLUDES THE 4" PVC R.R.&G. IRRIGATION MAIN LINE, PUMP STATION, AND ROTOR HEADS. (NOTE: THE 2-1/2" PVC LINE AND MAINTENANCE QUICK COUPLING VALVES ARE TO REMAIN IN THE BID.)

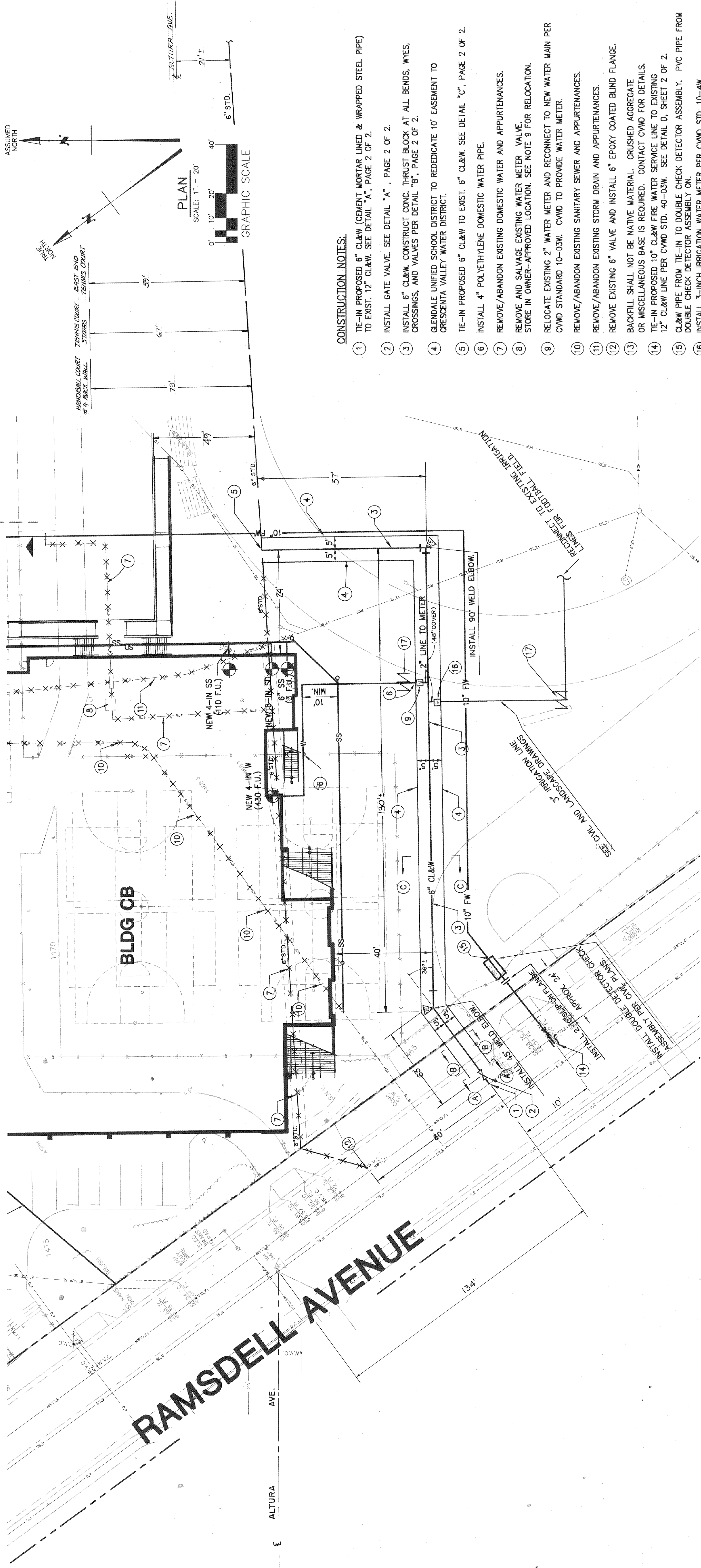


UTILITY PLAN

GMX Sports Engineers

SCALE: AS NOTED	DATE: 10-25-05	CMX PROJ. 3139.01
DESIGNED: CMX	DRAWN: CMX	APPROVED: MML

REV.	DWG. NO.
	TF-07
	SHT. 7 OF 14



CONSTRUCTION NOTES:

- 1 TIE-IN PROPOSED 6" CL&W (CEMENT MORTAR LINED & WRAPPED STEEL PIPE) TO EXIST. 12" CL&W. SEE DETAIL "A", PAGE 2 OF 2.
- 2 INSTALL GATE VALVE. SEE DETAIL "A", PAGE 2 OF 2.
- 3 INSTALL 6" CL&W. CONSTRUCT CONC. THRUST BLOCK AT ALL BENDS, WYES, CROSSINGS, AND VALVES PER DETAIL "B", PAGE 2 OF 2.
- 4 GLENDALE UNIFIED SCHOOL DISTRICT TO REDEDICATE 10' EASEMENT TO CRESCENTA VALLEY WATER DISTRICT.
- 5 TIE-IN PROPOSED 6" CL&W TO EXIST. 6" CL&W. SEE DETAIL "C", PAGE 2 OF 2.
- 6 INSTALL 4" POLYETHYLENE DOMESTIC WATER PIPE.
- 7 REMOVE/ABANDON EXISTING DOMESTIC WATER AND APPURTENANCES.
- 8 REMOVE AND SALVAGE EXISTING WATER METER VALVE. STORE IN OWNER-APPROVED LOCATION. SEE NOTE 9 FOR RELOCATION.
- 9 RELOCATE EXISTING 2" WATER METER AND RECONNECT TO NEW WATER MAIN PER CVM STANDARD 10-03W. CVM TO PROVIDE WATER METER.
- 10 REMOVE/ABANDON EXISTING SANITARY SEWER AND APPURTENANCES.
- 11 REMOVE/ABANDON EXISTING STORM DRAIN AND APPURTENANCES.
- 12 REMOVE EXISTING 6" VALVE AND INSTALL 6" EPOXY COATED BLIND FLANGE.
- 13 BACKFILL SHALL NOT BE NATIVE MATERIAL. CRUSHED AGGREGATE OR MISCELLANEOUS BASE IS REQUIRED. CONTACT CVM FOR DETAILS.
- 14 TIE-IN PROPOSED 10" CL&W FIRE WATER SERVICE LINE TO EXISTING 12" CL&W LINE PER CVM STD. 40-03W. SEE DETAIL D, SHEET 2 OF 2.
- 15 CL&W PIPE FROM TIE-IN TO DOUBLE CHECK DETECTOR ASSEMBLY. PVC PIPE FROM DOUBLE CHECK DETECTOR ASSEMBLY ON.
- 16 INSTALL 3-INCH IRRIGATION WATER METER PER CVM STD. 10-4W.
- 17 INSTALL REDUCED-PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY. SEE CDHS LIST OF APPROVED DEVICES.

LEGEND

C.V.W.D. CRESCENTA VALLEY WATER DISTRICT.

DISCLAIMER

APPROVAL BY C.V.W.D. DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF DESIGN OR THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES, STRUCTURES, AND CONDITIONS WITHIN THE LIMITS OF THIS PROJECT.

GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY C.V.W.D. SUPERINTENDENT LARRY BYERS FIVE (5) WORKING DAYS PRIOR TO STARTING WORK. (818)248-2185 OR (818)254-6520
 2. C.V.W.D. WILL EXECUTE ALL SHUT-DOWNS AND TURN-ONS. THE CONTRACTOR SHALL PROVIDE THE DISTRICT WITH AT LEAST (5) WORKING DAYS NOTICE. WATER TIGHT SHUT-DOWNS ARE NOT ASSURED BY THE DISTRICT. THEREFORE, THE CONTRACTOR SHALL BE PREPARED FOR VALVE LEAKAGE THAT MAY OCCUR DURING SYSTEM SHUT-DOWN.
 3. ALL WORK SHALL CONFORM TO C.V.W.D. STANDARD SPECIFICATIONS AND STANDARD DRAWINGS.
 4. ALL WATER SYSTEM INSTALLATIONS SHALL BE INSPECTED BY C.V.W.D.
 5. PIPE SHALL HAVE A MINIMUM OF 36 INCHES OF COVER AND A MAXIMUM OF 42 INCHES OF COVER FROM FINISHED GRADE. UNLESS OTHERWISE NOTED.
 6. ALL FIELD WELDING SHALL BE IN ACCORDANCE WITH AWWA C206.
 7. BACKFILL PROCEDURE SHALL BE COVERING THE PIPELINE WITH APPROVED BEDDING MATERIAL, HAND PLACED DEPTH OF 8 INCHES OR MORE ABOVE THE TOP OF THE PIPE. THE BALANCE OF BACKFILL SHALL CONTAIN NO STONES MORE THAN 2 INCHES IN THEIR LARGEST DIMENSION, AND THE BACKFILL MIXTURE SHALL NOT CONTAIN MORE THAN 23% STONES.
 8. THE CONTRACTOR SHALL HYDROSTATICALLY TEST ALL PIPE UPON COMPLETION. THE REQUIRED TEST SHALL BE IN ACCORDANCE WITH SPECIFICATIONS.
 9. FLUSHING AND DISINFECTION: UPON COMPLETION OF THE HYDROSTATIC TESTS, THE PIPES SHALL BE FLUSHED AND DISINFECTED. DISINFECTING SHALL BE IN ACCORDANCE WITH THE STANDARD FOR DISINFECTING WATER MAINS, (AWWA C601) AND SHALL BE SCHEDULED WITH C.V.W.D.
 10. ALL FITTINGS AND VALVES SHALL MEET C.V.W.D. SPECIFICATIONS.
 11. ALL CONNECTIONS TO EXISTING FACILITIES SHALL BE SCHEDULED WITH C.V.W.D. NO CONNECTIONS SHALL BE MADE TO C.V.W.D. SYSTEM UNTIL PIPE HAS SUCCESSFULLY PASSED THE HYDROSTATIC AND DISINFECTION TEST.
12. ALL SERVICE LATERALS SHALL CONFORM TO C.V.W.D. STANDARDS.
 13. ALL VALVE CANS SHALL BE RAISED TO FINISH GRADE DURING FINAL PAVING.
 14. WATER SERVICE SHALL BE CONNECTED TO NEW WATER MAIN AFTER HYDROSTATIC TESTING AND DISINFECTING, AND PRIOR TO FINAL TIE-IN OF NEW WATER MAIN.
 15. BY APPROVING THIS PLAN, THE WATER PURVEYOR IS NEITHER GUARANTEEING NOR AGREEING THAT IT WILL SUPPLY WATER AT ANY SPECIFIC QUANTITIES OR PRESSURE AND NO SUCH OBLIGATION IS CREATED HEREBY.
 16. CONTRACTOR TO NOTE THAT EXACT LOCATION AND DEPTH OF EXISTING FACILITIES MAY VARY AND SHOULD BE VERIFIED BY EXPLORATORY EXCAVATION AT THE TIME OF CONSTRUCTION. CONTRACTOR TO BE RESPONSIBLE FOR PROVIDING SERVICE ALERT PRI. 1-800-227-2600, AT LEAST TWO WORKING DAYS PRIOR TO DIGGING.
 17. TRAFFIC CONTROL DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL CONFORM WITH REQUIREMENTS OF LOCAL TRAFFIC AUTHORITY.
 18. ALL UNLINED FITTINGS AND SPECIALS SHALL BE FIELD MORTAR LINED (MIN. 5/16" THICK).
 19. NO HOSE OR FIRE HYDRANT SHALL BE USED IN THE COLLECTION OF BACTERIOLOGIC SAMPLES. A RISER WITH SAMPLING TAP, OR OTHER C.V.W.D. APPROVED INSTALLATION SHALL BE REQUIRED.
 20. ALL OFFSET DISTANCES ARE APPROXIMATE, CONTRACTOR SHALL VERIFY LOCATION PRIOR TO CONSTRUCTION.
 21. EASEMENT SURVEY SHALL BE COMPLETED AFTER THE CONSTRUCTION OF WATER LINES.

SCALE: 1" = 20'	DATE	SHT. 1	OF 2	SHTS.
DRAWN BY: T. JOHNS	1/27/2000	COMPLETION DATE	LINEAR FT.	FILE NO.
CHECKED BY:		JOB NO.	FILE NO.	
APPROVED: J. A.H.	8/27/01	E-667A	C-115	
AS BUILT:				

CRESCENTA VALLEY WATER DISTRICT

6" WATER MAIN INSTALLATION AT

CRESCENTA VALLEY HIGH SCHOOL

4400 RAMSDELL AVENUE

CRESCENTA VALLEY WATER DISTRICT

STAFF REPORT

Information Item No. 5
July 12, 2019

To: Engineering Committee
From: David S. Gould, P.E. – District Engineer
Subject: **Water Hydraulic Model and Geographical Information System (GIS) Update**

INFORMATION ITEM:

Water Hydraulic Model and GIS Update, Project E-1007: Award a contract to Akel Engineering to provide professional consulting services to upgrade CVWD's water hydraulic model and associated information for geographical information system (GIS) update for a not-to-exceed cost of \$55,263.

BACKGROUND:

An up-to-date hydraulic model is the backbone of a number of water and wastewater master plans and studies. This information will be utilized in CVWD's urban water management plan, asset management plan and future water & wastewater master plan. A robust and up-to-date hydraulic model is also a valuable tool for that can be integrated into the daily operations, giving staff the ability to perform virtual fire flow testing, analysis of booster pumps with possible power cost savings, water quality and surge analysis, and asset management.

CVWD had contracted with IDModeling (IDM) to establish our hydraulic model while doing the last water master plan in 2007. Since then CVWD has installed approximately five (5) miles of new water main, replaced various valves and added additional water services for developer projects. The new pipes, valves, meters, etc... associated with these capital improvements have not been included in the current hydraulic model.

It was the Engineering Department's original intention to update the water system infrastructure layers of GIS in house as time permitted. However, the number of developer projects and O & M projects has increased over the past few years and has not allowed staff to fully concentrate on the detailed work necessary to update the GIS model. In order to update the hydraulic model in house, staff would require a new software platform, called "InfoWater", which could be cost prohibitive to purchase since the licensing quotes being provided are well over \$10,000 annually per seat.

DISCUSSION:

Staff met with Dr. Tony Akel from Akel Engineering, Inc. (Akel) and Paul Hauffen from Sedaru, Inc., formerly IDM. Both companies provide support services for the GIS updates and possess the software licenses to update and calibrate CVWD's hydraulic model. After discussing the scope of work with both companies in May and June of 2017, they provided proposals. The following is a summary of the submitted proposals:

Company	Proposal Amount
Akel Engineering Group, Inc.	\$55,263
Sedaru, Inc. – Proposal 1 (Update Only)	\$63,000
Sedaru, Inc. – Proposal 2 (Update and Sedaru Asset Management Phase 1 implementation)	\$80,000

There are several differences between the companies shown above. Sedaru (formerly IDM) has a larger modeling staff with several clients in our area. They also have the advantage of having worked directly with our GIS database in the past.

Sedaru, Inc. has developed propriety software for asset management, called Sedaru. Their proposal offers an option for "Phase one" of that software platforms implementation. Sedaru did a demonstration of the software at the Glenwood Operations Facility on June 27, 2019. Staff was impressed with the presentation, but there were several drawbacks. First would be an annual licensing fee for the platform of \$2,400 per seat, which is expensive relative to a standard ESRI licensing package. Second, the software only runs on Apple operating systems, which would severely limit staffs hardware options for tablets and phones used in the field.

Akel Engineering (Akel) is a smaller organization with a smaller project workload. After reaching out to their provided references, it appears that they have strong project experience, which has yielded very positive results. They were recommended by the InfoWater software distributor as one of the better firms performing GIS and hydraulic modeling update work within the area.

RECOMMENDATION:

It is staff's recommendation to award a contract to Akel Engineering Group, Inc. for \$55,263 at the next Board meeting on July 23, 2019. There is funding available in the FY 19/20 Administrative Consultants budget for these services.

Prepared by:



Brook Yared, P.E.
Senior Engineer

Submitted by:



David S. Gould, P.E.
District Engineer

Attachment:

1. Sedaru proposal dated June 27, 2019
2. Akel Engineering Group proposal dated June 17, 2019



June 17, 2019

Crescenta Valley Water District
2700 Foothill Boulevard
La Crescenta, CA 91214

Attention: Brook Yared, MS, PE
Senior Engineer

Subject: Proposal for the Water System GIS and Hydraulic Model Update and Water Model Calibration

Dear Brook,

Akel Engineering Group (Akel) is pleased to submit this proposal for consulting services to update the Water System GIS and to update and calibrate the hydraulic model.

Background

The Crescenta Valley Water District (CVWD) currently services potable water to approximately 8,000 accounts representing a population of 32,000 in a four square mile area located in the San Gabriel Mountain foothills of Los Angeles County. CVWD last updated their water master plan in 2004, and developed and calibrated a hydraulic model at that time. The model was based in Innovyze's H2ONet, and was calibrated for steady state and extended period simulations.

As part of CVWD staff efforts to modernize the hydraulic model, they have begun the process of updating their GIS. This includes the in-progress effort to locate, map, and catalog the water meters, with the ultimate goal of migrating to an Advanced Meter Infrastructure system. Accordingly, CVWD has requested a scope of work and fee estimate to complete the GIS and hydraulic model update and model calibration. The model will be updated and calibrated in Innovyze's InfoWater modeling software.

Scope of Work

Task 1. Water System GIS Update

Task 1.1 GIS Geometry Review and Update. This task consists of a thorough review of the water system GIS geometry. It is assumed that CVWD will provide any available

improvement plans, which shall be reviewed and compared for accuracy with the current spatial data. Special attention shall be paid to pipe distance from road centerlines or parcel lines, as well as any high precision coordinate locations that have been placed on the plans.

Task 1.2 GIS Attribute Review and Update.

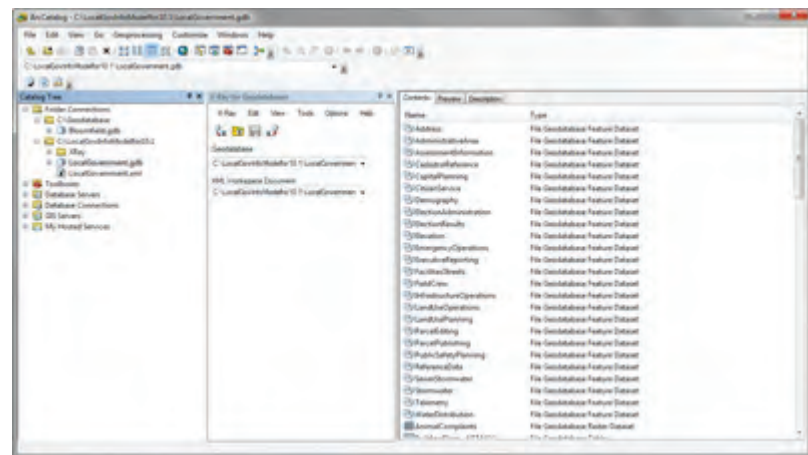
This task will include the population of missing attribute information found on CVWD's water infrastructure improvement plans, where available. A review with CVWD of the GIS data will be performed to determine which attribute are most critical for populating into the database. Attributes such as size, material, installation date, and other data attributes considered a priority to CVWD will be reviewed for accuracy and populated where necessary.



Task 2. GIS Conversion

Task 2.1 Conversion to LGIM and Data Quality Review.

This task will include converting the newly updated water system GIS datasets into a Local Government Information Model and reviewing the data for completeness and quality assurances. A data quality analysis shall be performed using tools and methodologies recommend by Esri. After a review period, the necessary updates or edits to the water system datasets will be performed.



Task 2.2 GIS Conversion. This task is consists of redeveloping the hydraulic model for consistency with the GIS developed as part of Task 2. This includes importing the GIS into Innovyze's InfoWater platform, which is a GIS-based hydraulic modeling software.

Task 3. Hydraulic Model Update

Task 3.1 Water System Control Settings. This task consists of updating the hydraulic model pump station, PRV, tank, and well elements to



account for the physical SCADA controls. These controls may include pressures, flows, tank levels, or other physical controls used for operating the water system.

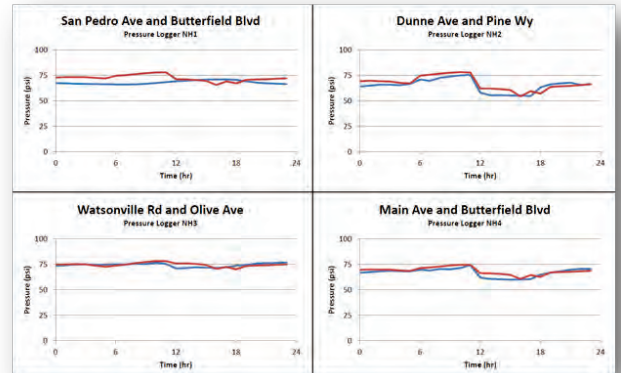
Task 3.2 Water System Demand Allocation. This task consists of evaluating the billing records for CVWD and allocating flows using one of several available methodologies, and which may include: Geo-Coding, APN matching, Meter XY Coordinates, or other.

Task 3.3 Diurnal Pattern Development. This task consists of developing pressure zone specific diurnal demand patterns. This will be based on the system SCADA for pumping and tank level fluctuations, and correlated to the demands from the billing records.

Task 4. Hydraulic Model Calibration

Task 4.1 Calibration Plan. This task consists of providing CVWD with a plan for calibrating the hydraulic model, including both SCADA points and proposed telelogger locations. This task assumes that CVWD will procure and install the teleloggers, and AEG will provide preferred locations. This task will include a review of daily production records in order to determine peak use periods throughout the year.

Task 4.2 Hydraulic Model Calibration. This task consists of calibrating the hydraulic model to the SCADA and telelogger information gathered as part of Task 3.3. Calibration graphs will be submitted to CVWD staff for review and approval.



Task 5. Hydraulic Model Training

This task consists of a one day training workshop intended to teach an introductory level course on hydraulic modeling. The first half of the day will consist of learning the general layout of the model, the basics of model elements, and how to run the model scenarios. The second half of the day will consist of utilizing the CVWD model to learn the process on the CVWD InfoWater model. This will include fire flow analysis, water trace, and tank evaluations.



Task 6. Project Management and Coordination.

Task 6.1 Project Management. This task consists of general project coordination and oversight, including keeping CVWD apprised of project status updates. This task includes monthly progress reports, scheduling and invoicing.

Task 6.2 Workshops and Meetings.

Task 6.2.1 Kickoff Meeting. This task consists of preparing for and conducting a kickoff meeting. This includes documenting meeting minutes, and submitting draft and final minutes for staff review. The consultant will recommend staff for attendance and provide Project Team handouts to facilitate discussions.

Task 6.2.2 Progress Meetings. This task consists of coordinating and scheduling monthly progress meetings to document key decisions and milestones throughout the process.

Task 6.2.3 Workshops and Focused Meetings. This task includes holding meetings in as needed webconferences and a workshop to present the results of the GIS build and hydraulic model calibration results.

Water System GIS and Hydraulic Model Update and Water Model Claibration

Cost Proposal

(June 17, 2019)

Task No.	Task Description	Hours						Costs			
		Principal	Senior Engineer	Engineering Associate	Engineering Assistant	GIS Analyst	Secretarial	Total Hours	Labor Costs	Other	Total Cost
		\$194	\$176	\$157	\$118	\$107	\$80				
Task 1	Water System GIS Update										
Task 1.1	GIS Geometry Review and Update	2	5			40		47	\$5,548		\$5,548
Task 1.2	GIS Attribute Review and Update	1	3	8		100		112	\$12,678		\$12,678
	<i>Subtotal</i>	3	8	8	0	140	0	159	\$18,226		\$18,226
Task 2	GIS Conversion										
Task 2.1	Conversion to LGIM and Data Quality Review	1	3			35		39	\$4,467		\$4,467
Task 2.2	GIS Model Conversion and QA/QC		2	4		8		14	\$1,836		\$1,836
	<i>Subtotal</i>	1	5	4	0	43	0	53	\$6,303		\$6,303
Task 3	Hydraulic Model Update										
Task 3.1	Water System Control Settings	1	2	8	4			15	\$2,274		\$2,274
Task 3.2	Water System Demand Allocation	2	6	20	15	12		55	\$7,638		\$7,638
Task 3.3	Diurnal Pattern Development	1	3	12	8			24	\$3,550		\$3,550
	<i>Subtotal</i>	4	11	40	27	12	0	94	\$13,462		\$13,462
Task 4	Hydraulic Model Calibration										
Task 4.1	Calibration Plan	1	2	6		4		13	\$1,916		\$1,916
Task 4.2	Hydraulic Model Calibration	3	8	12	20	12		55	\$7,518		\$7,518
	<i>Subtotal</i>	4	10	18	20	16	0	68	\$9,434		\$9,434
Task 5	Hydraulic Model Training										
		6	12					18	\$3,276		\$3,276
Task 6	Project Management and Coordination										
Task 6.1	Project Management and Coordination	4	8					12	\$2,184		\$2,184
Task 6.2	Workshops and Meetings	5	8					13	\$2,378		\$2,378
	<i>Subtotal</i>	9	16	0	0	0	0	25	\$4,562		\$4,562
Total		27	62	70	47	211	0	417	\$55,263	\$0	\$55,263

Notes:

1. Per conversation with CWWWD Staff on 6/17/2019, the parcel database has been cleaned and updated, and requires no further review.
2. This task assumes approximately 5 miles of new pipelines added at approximately 425 as-builts.

AKEL
ENGINEERING GROUP, INC.

June 27, 2019

Brook Yared
Senior Engineer
Crescenta Valley Water District
2700 Foothill Boulevard
La Crescenta, CA 91214

Subject: Proposal for a Water Model Update and Calibration

Dear Mr. Yared:

Sedaru is pleased to submit this proposal to update & calibrate the water system model (the Project) for the Crescenta Valley Water District (CVWD or District).

Project Understanding: Sedaru will deliver on all aspects of this Project, including the below:

1. Updating the District-provided water GIS, utilizing as-builts for an estimated 5 miles of pipeline.
2. Utilizing the updated GIS to import GIS-based line work and associated attributes into the District's current hydraulic model software.
3. Hydraulic updates to the District's water model, including and not limited to: water demands, elevations where needed, PRV settings, pump initial status' boundary conditions, etc.
4. Apply existing, District-provided hydrant tests to develop a Steady State model calibration.
5. Deliver hydraulic model files in H2ONET and InfoWater native file formats.
6. Deliver the calibrated hydraulic Model in the Sedaru Modeling application for ongoing, internal what-if simulations, including fire flows, pipeline sizing, pump offline and more, scenarios.
7. Delivery of a 4-hour training with H2ONET, in addition to a 2-hour training utilizing Sedaru Modeling.

Special Considerations: The special considerations below reflect our understanding of CVWD's internal state of modeling software and experience. This understanding will help drive an approach that produces meaningful deliverables for the District.

- The District currently uses the AutoCAD-based hydraulic modeling software H2ONET, and does not anticipate upgrading until fiscal year 2020-21. Future modeling software upgrades may consider the GIS-based modeling software InfoWater.
- District's current in-house modeling experience is beginner level, with expectations to run internal fire flows, understand impacts of pipe closures, and pumps out-of-service.
- The District's last water master plan was completed in 2007, with Civiltect as the Prime Consultant and Sedaru (then, IDModeling Inc.) as the hydraulic model subconsultant.

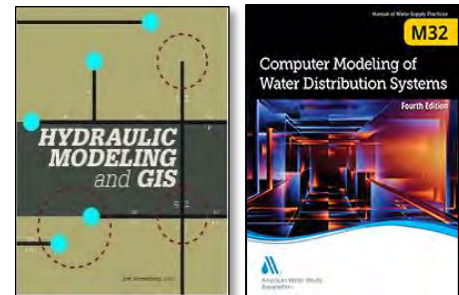
Familiarity, Locality, and Project Experience: The Sedaru team is familiar with the District's water model, water system hydraulics, internal team expectations, and requirements of this Project. Based in San Dimas-CA (approximately 40 minutes from the District), Sedaru has completed similar projects for local utilities including Rubio Canon Land & Water Association, Burbank Water & Power, Santa Clarita Valley Water Agency (formerly Castaic Lake Water Agency), City of Pomona, Azusa Light & Water, Los Angeles Department of Water & Power, and many more.

Budget Options: Sedaru proposes 2 budget options for the District's consideration, as summarized below. We have included the scope of work for the Hydraulic Model Project as **Exhibit A**.

1. **\$63,000 Option 1:** Hydraulic Model Project, Stand Alone:
 - a. **\$63,000** including 1 user license of the Sedaru Modeling app @\$2,400/year
 - b. Includes onsite training with documentation
2. **\$80,000 Option 2:** Hydraulic Model Project + Sedaru Asset Management Software Phase 1
 - a. **\$56,900** for Hydraulic Modeling Project, including Sedaru Modeling app @\$2,400/year
 - b. Includes onsite training with documentation
 - c. **\$23,100** for Sedaru Asset Management Software Phase 1, including:
 - i. 6 field data collection forms for water distribution* = \$7,200 (one-time cost)
 - a. 3 hydrant field data collection forms
 - b. 3 valve field data collection forms, including Wachs Controller
 - c. **forms can be any combination vs. the above suggested.*
 - ii. GIS related support and configuration = \$2,250 (one-time)
 - iii. Onsite training, documentation & support to ensure usage = \$2,250 (one-time)
 - iv. Licensing for up to 6 named users = \$9,000/year
 - v. Licensing for one Wachs Valve Turning Machine integration = \$2,400/year

Payment Terms: Sedaru software is billed upon authorization. Services are billed 50% upfront for initialization and mobilization at contract authorization. Subsequent payment terms for services are 25% and 25% at substantial completion of agreed-upon milestones.

GIS + Hydraulic Modeling Experts: The Sedaru team has decades of experience in GIS, utility information systems, data set integrations, and hydraulic modeling applications to provide a professional engineer's perspective to asset and operational management Projects. Sedaru co-authored Esri's Hydraulic Modeling and GIS Handbook and was a leading contributor to the AWWA's M32, Manual of Practice for Water Distribution Systems Modeling. We work with hydraulic modeling software every day, bringing a deep technical understanding of each platform. Our proposed Project Team's experience is included as **Exhibit B**.



Thank you for inviting Sedaru to this opportunity. We look forward to visiting with your team to implement our experience and collaborate with yours, to successfully complete your GIS, hydraulic model update and calibration, while supporting CVWD's broader asset management initiatives.

Please contact me at 626-244-0700 or paulhauffen@sedaru.com with any questions.

Sincerely,



Paul Hauffen,
CVWD Client Service Manager
Phone: (626) 354-7003
Email: paulhauffen@sedaru.com

Exhibit A: Hydraulic Model Project

Implementation Task	Budget
IMPLEMENTATION DETAILS	
Task 1: Water GIS Updates <i>Includes a Discovery Meeting and Preparation, including a walk through of the District's GIS Environment and requirements gathering/sharing. The Sedaru team will review the as-built drawings to update approximately 5 miles of pipe in the District's water system GIS. The Sedaru team will also review each as-built sheet to populate GIS features with attribute information found on the District's water infrastructure improvement plans. Priority will be given to critical attributes ensuring they are as complete as reasonably possible with the information provided in the associated improvement plans.</i>	\$6,000
Task 2: GIS Conversion <i>Once Task 1 is complete, Sedaru will QA/QC the GIS updates focusing on connectivity and asset attribution. After District acceptance, the updates will be converted/imported into the hydraulic model.</i>	\$7,000
Task 3: Hydraulic Model Update <i>Following acceptance of GIS updates from Tasks 1 & 2, the water system hydraulic model will be updated in the key areas as identified during the GIS update. This update process includes keeping relevant existing model information and updating key model components based on a review of the existing model and updated GIS. This also includes any hydraulic changes since the last model update such as: pressure zone boundary valves, PRV settings, facility status, etc. Demands for the newly added pipes will be estimated based on existing production data and allocated to the updated pipes and overall demands scaled to match existing production data.</i>	\$20,000
Task 4: Hydraulic Model Calibration <i>Using the updated hydraulic model, historical fire hydrant flow and pressure data will be used to calibrate the model under steady-state conditions against available District SCADA information. Up to 3 hydrant locations per zone will be used for calibration. An overall calibration plan will be developed to outline the process, data available, and calibration goals. Calibration results will be summarized in a technical memorandum.</i>	\$24,600
Task 5: Sedaru Modeling App <i>Predict system response for fire flows, pipeline sizing, pump operations, changes in water demand, and more.</i>	\$2,400
Task 6: Staff Training <i>Delivery of the model in the District's preferred modeling platform (assumes InfoWater or H2ONet) as well as Sedaru Modeling. The Sedaru team will conduct a 1-day training for District staff with a focus on using the updated hydraulic model in both the preferred modeling platform as well as Sedaru Modeling.</i>	\$3,000
SUBTOTAL	\$63,000
TOTAL SERVICES	\$63,000

Exhibit B: Sedaru Team Resumes



Paul Hauffen

Client Service Manager & Technical Advisor

Highlighted Project Experience

LOS ANGELES DEPARTMENT OF WATER AND POWER (LADWP) – CA

Hydraulic Modeling Project for 29 Zone Models

Technical Advisor

As sub-consultant to Arcadis, Sedaru is supporting LADWP with the water model construction, steady-state and extended period simulation calibrations, documentation and training for 29 zone models which represent 29 distinct pressure zones. The project involves data collection, model development from LADWP GIS and best available data, and calibration using pressure survey, SCADA data, and staff institutional knowledge and experience. This is a multi-year project, with 5-8 models being built per year.

CITY OF POMONA – CA

Dynamic Asset Management & Field Data Collection

Client Service Manager

Sedaru is deployed at the City of Pomona, supporting dynamic asset management and field data collection. The City is using Sedaru to manage hydrants, valves, meters, water production, and water treatment assets. In addition, sewer main maintenance and manhole inspections are managed in Sedaru. Sedaru is also working with the City to develop and update the City's Utility Strategic Plan in Sedaru CIP. This plan acts as a dynamic master plan, helping to prioritize asset maintenance and replacement.

CITY OF VICTORVILLE – CA

Digital Transformation & CMMS Implementation

Client Service Manager & Technical Advisor

Sedaru built the City's new water GIS, deployed Sedaru CMMS, integrated Sedaru with the City's ArcGIS Server, and completed a real-time, bi-directional integration with the City's CIS (Tyler Munis). The City now uses Sedaru with their new GIS and hydraulic model to

Experience: 25 Years

2004-Present

Sedaru

2003-2004

Kennedy/Jenks

1999-2002

MWH Soft (Innovyze)

Key Skills:

- ✓ Utility Management Systems
- ✓ Operations Management
- ✓ Network Intelligence
- ✓ Decision Support Systems
- ✓ Network Modeling
- ✓ Enterprise Integrations
- ✓ Capital Improvement
- ✓ Water Loss
- ✓ Resource Management

Education & Certificates:

Bachelor of Science Civil Engineering

Loyola Marymount University

monitor and complete work specific to water production, distribution, and work management for their water & sewer system.

Additional Project Experience

EAST BAY MUNICIPAL UTILITIES DISTRICT (EBMUD) – CA

Sedaru Outage and Work Order Management Integration w/Field Data Collection
Client Service Manager and Technical Advisor

EBMUD requires improved response to leaks and breaks, utilizing existing tools with new technology. Sedaru Smart Outage, Command Center and Field Mobility was selected to deploy as a complete event response system (leaks, breaks, valve exercising, etc.), leveraging existing EBMUD tools, data and institutional knowledge. EBMUD's deployment also includes Wachs valve turning machine and work order management functionality.

LOS ANGELES DEPARTMENT OF WATER AND POWER (LADWP) – CA

Water Loss Management with Sedaru
Client Service Manager and Technical Advisor

Deployed Sedaru Outage to support LADWP leak/break response & planning. Sedaru Outage immediately identifies valves to close, customers affected, calculates water loss, and automates water loss reporting, and allows field crews and customer service to respond within the same event, concurrently, in real-time. Also used the Sedaru Outage algorithm to develop a response plan for any outage area identified for a leak or break.

CITY OF BENICIA – CA

Utility Management system for water and public works
Technical Advisor

City of Benicia delivers water service to over 28,000 residents. Sedaru was implemented to consolidate information into a single mobile computerized maintenance management system (CMMS). Sedaru integrates and displays data from the City's water distribution, sewer collection and streets divisions. Field team use Sedaru for enhanced data access and mobile work management. Sedaru provides the City a platform for asset and network management, delivering real-time, mobile work management and network intelligence for water pipes, water quality, hydrants, valves, customer meters, pumps and tanks; sewer gravity mains, force mains, manholes, lift stations and wet wells; and streets, signs, streetlights, trees and sidewalks, as well as hydrologic modeling and predictive maintenance for disaster management.



Jennifer Wood, P.E.

Project Manager

Highlighted Project Experience

RUBIO CANON LAND AND WATER ASSOCIATION (RCLWA) – CA

Hydraulic Model Build, Calibration, and Sedaru Implementation
Project Manager

Sedaru is building and calibrating the utility's first water system hydraulic model. The model was built from GIS and CAD reference data. The steady-state calibration is currently in progress based on recent hydrant flow test, pressure, and available SCADA data. The model will be delivered in Sedaru Modeling for an easy-to-use solution to use for on-going model analysis and field verification.

AZUSA LIGHT AND WATER (ALW) – CA

Hydraulic Modeling Support
Project Engineer & Project QA/QC

Sedaru provides on-going modeling support for ALW in support of pipeline and pump station design projects and system capacity evaluations. Evaluated the water system capacity to provide adequate pressures under different demand conditions for the proposed Raider Crater industrial development. Developed system curves for the Vernon and 11th Street pump station for pump selection and design. Reviewed previous system analysis reports and validated findings and recommendations.

LOS ANGELES DEPARTMENT OF WATER AND POWER (LADWP) – CA

Hydraulic Modeling Project for 29 Zone Models
Project Manager/Engineer

Sedaru is supporting LADWP with the water model construction, steady-state and extended period simulation calibrations, documentation, and training for 29 zone models which represent 29 distinct pressure zones. The project involves data collection, model development from LADWP GIS and best available data, and calibration using pressure survey, SCADA data, and institutional staff knowledge and experience. This is a multi-year project, with 5-8 models being built per year.

Experience: 11 Years

2016-Present

Sedaru

2008-2016

Consolidated Utility District

Key Skills:

- ✓ Model Building & Calibrating
- ✓ Asset Management
- ✓ Capital Improvement
- ✓ Water Quality
- ✓ GIS (Esri)
- ✓ Utility Operations
- ✓ Project Management

Education & Certificates:

Bachelor of Science, Civil Engineering
University of Tennessee at Martin

Professional Engineer
State of Tennessee
License #116272

Additional Project Experience

LOS ANGELES DEPARTMENT OF WATER & POWER (LADWP) – CA

Griffith Park Hydraulic Model and Distribution Alternatives

Project Manager

Sedaru is teamed with Arcadis to develop and calibrate the hydraulic model which will be used to gain system knowledge and insight, evaluate the hydraulic and water quality characteristics of the existing infrastructure, and make improvement recommendations to meet service goals and regulatory compliance.

EAST VALLEY WATER DISTRICT (EVWD) – CA

Water and Sewer Master Plan Update

Project Manager

Sedaru teamed with Stantec to provide professional engineering services for the Water System Master Plan Update (WSMPU). The goals of this project are to update the water hydraulic model, analysis the system for deficiencies, develop prioritized and phased Capital Improvement Programs, and generate a GIS Database Management Plan for both water and sewer that the District can use for on-going GIS maintenance and model updates.

GOLETA WATER DISTRICT (GWD) – CA

SB Corp Well Blending & Hydraulic Constriction Analysis

Project Engineer

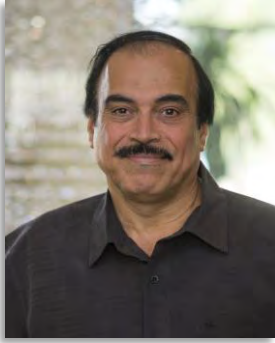
Sedaru created model scenarios to test the addition of a proposed groundwater well and the impact of that well on water quality. The analysis consisted of a source trace analysis using the existing well and analyzing the change in the blending ratio at the District's water quality sampling sites. In addition, the model was used to determine if any constrictions within the piping network would occur with the addition of the new well. The analysis was completed using the District's InfoWater model.

CITY OF SANTA ANA – CA

Water System Master Plan

Project Engineer

Sedaru is applying the potable water system model to support the City's Water Master Plan to identify CIP utilizing traditional hydraulic model and engineering methods, in addition to deploying Sedaru CIP to analyze condition and performance deficiencies from across multiple systems to automate the identification and prioritization of pipeline replacement projects.



Youssif Hussein, P.E.

Technical Advisor

Highlighted Project Experience

AZUSA LIGHT AND WATER (ALW) – CA

Hydraulic Modeling Support

Project Engineer

Mr. Hussein provides on-going modeling support for ALW in support of pipeline, pump station design projects, and system capacity evaluation. Evaluated the water system capacity to provide adequate pressures under different demand conditions for the proposed Raider Crater industrial development. Evaluated redundancy supply alternatives to serve the proposed development from adjacent pressure zones, performed hydraulic analyses, identified system deficiencies, and recommended system improvements. Developed system curves for the Vernon and 11th Street pump station for pump selection and design. Reviewed previous system analysis reports and validated findings and recommendations.

CITY OF POMONA – CA

Water & Wastewater Operations Utility Strategic Plan

Project Manager

Mr. Hussein led the development of the City's water distribution system hydraulic network model from GIS, demand allocation, and steady-state and EPS model calibration using hydrant tests, SCADA data, and field measurements. Diurnal curves were developed for each pressure zone using an hourly mass balance. The model was verified by comparing system operations with historical system operating data. Performed hydraulic analysis for different demand conditions and identified system improvements. A prioritized capital improvement plan was developed to meet distribution system needs for existing through buildout conditions.

Experience: 35 Years

2017-Present

Sedaru

1987-2016

CDM Smith

Key Skills:

- ✓ Hydraulic Modeling
- ✓ Hydrology
- ✓ Customer Billing Systems
- ✓ Asset Management
- ✓ Capital Improvement
- ✓ GIS (Esri)
- ✓ Master Planning

Education & Certificates:

Master of Science, Civil Engineering, Hydrology, & Water Resources Science
University of Texas
Arlington

Professional Engineer
State of California
Certification #55678

Additional Project Experience

LOS ANGELES DEPARTMENT OF WATER AND POWER (LADWP) – CA

Development of Hydraulic Models

Task Leader

Mr. Hussein is currently in charge of developing hydraulic models for specific pressure zones for LADWP. Model development includes importing physical and informational attributes from GIS geodatabases, demand allocation using billing data, elevation assignment using DEM, performing steady state and extended period simulation to calibrate model against SCADA data and field pressure measurement data.

GOLETA WATER DISTRICT (GWD) – CA

System Reliability and Rehabilitation Study

Senior Project Engineer

Mr. Hussein evaluated potential emergency, failure, and drought scenarios that could affect the Goleta Water District's water distribution system and identified the level of service based on the comparison of the available supply to the total demands. He performed a hydraulic analysis to identify facility improvement requirements and their associated costs.

NEVADA IRRIGATION DISTRICT (NID) – CA

Hydraulic System Analysis

Task Leader

Mr. Hussein has been performing hydraulic analyses for NID in support of design projects and system capacity evaluation. Evaluated the backbone extension program (BEP) proposed along Rattlesnake Road in the Loma Rica System for capacity meet system requirements while the Osborn Hill Tank and La Barr Meadows pressure reducing station (PRV) are out of service. Evaluated the impact of adding the Placer County Water System (PCWS) to the existing NID water system and assess the capacity of the NID water system under different existing demand conditions to meet system pressures and fire flow requirements. Evaluated the District's Rodeo Flat Pump Station (PS) to determine if it is possible to serve the Table Meadows project without upgrading the pump station and evaluated upgrading some of the existing pumps to serve the project.



Matt Sellers, P.E.

Project Engineer

Highlighted Project Experience

CITY OF POMONA – CA

Water & Wastewater Operations Utility Strategic Plan

Task Leader, Water System Hydraulic Analysis

Sedaru developed the City's water distribution system hydraulic network model from GIS, allocated customer demands to model junctions using customer billing information, and calibrated the model under steady-state and EPS conditions using hydrant tests, SCADA data, and field measurements. Diurnal curves were developed for each pressure zone using an hourly mass balance. The model was verified by comparing system operations with historical system operating data. Performed hydraulic analysis for different demand conditions and identified system improvements. A prioritized capital improvement plan was developed to meet distribution system needs for existing through buildout conditions.

EAST VALLEY WATER DISTRICT – CA

Water and Sewer Master Plan Update

Project Engineer/Modeling Lead

Sedaru teamed with Stantec to provide professional engineering services for the Water System Master Plan Update (WSMPU). The goals of this project are to update the water hydraulic model, analysis the system for deficiencies, develop prioritized and phased Capital Improvement Programs, and generate a GIS Database Management Plan for both water and sewer that the District can use for on-going GIS maintenance and model updates.

Experience: 13 Years

2017-Present

Sedaru

2009-2017

CH2M Hill

2006-2008

Wiedeman and Singleton, Inc

Key Skills:

- ✓ Model Building & Calibrating
- ✓ Real-Time Modeling
- ✓ Demand Allocation
- ✓ Field Monitoring
- ✓ Master Planning
- ✓ Real-Time Operations
- ✓ Water Quality
- ✓ Non-revenue Water Studies

Education & Certificates:

Bachelor of Science, Civil & Environmental Engineering
Georgia Institute of Technology

Professional Engineer
State of Georgia PE038776

Distribution II (D2) Cert.
California SWRCB Operator
#50081

Additional Project Experience

SOUTH CENTRAL CONNECTICUT REGIONAL WATER AUTHORITY

Real-Time Modeling and Water Loss

Project Manager/ Engineer

RWA uses Sedaru to power their Water Distribution System Optimization initiative. RWA uses Sedaru to analyze SCADA data with real-time hydraulic modeling to understand past, present and predict future water operations to help inform RWAs operational. Sedaru also provides RWA greater insight into daily water loss by unifying AMI consumption data, real-time SCADA, and hydraulic model.

CITY OF SANTA ANA – CA

Uni-directional Flushing Plan

Project Manager/Modeling Lead

Sedaru was tasked with developing a detailed uni-directional flushing plan for approximately 30% of the water distribution system in order to help Santa Ana ensure water quality. The plan includes a comprehensive methodology and recommended best practices for executing their UDF plan, including customer engagement.

CITY OF SANTA ANA – CA

Walnut Pump Station Analysis

Project Manager/Modeling Lead

Utilize the hydraulic model to help predict how the system might respond to the Walnut Pump Station startup test which needs to reach full capacity (30 cfs) under June 2018 conditions. The hydraulic model will be used to predict the system's automatic response based on existing controls and will also be used to create a manual schedule to turn off supply facilities during the pump startup test.

CONSOLIDATED WATER WORKS (CWW) – LA

Model Development and Calibration

Project Manager/Engineer

CWW serves potable water to over 42,000 customers from two water treatment plants across over 1,000 miles of pipe, 16 elevated tanks, 5 ground tanks, and 2 standpipes. The purpose of this project is to build and calibrate CWW's first hydraulic model so they may have a valuable planning and operational tool. In addition, the finished model will be utilized in the Sedaru Smart Modeling application, where CWW will be able to quickly run scenarios to test hydrant flows, anticipated demands, and general effects of system changes on the distribution system.



Behnaz Khakbaz, PH.D., P.E.

Project Engineer

Highlighted Project Experience

CITY OF POMONA – CA

Water & Wastewater Operations Utility Strategic Plan

Project Engineer

Sedaru developed the City's water distribution system hydraulic network model from GIS, allocated customer demands to model junctions using customer billing information, and calibrated the model under steady-state and EPS conditions using hydrant tests, SCADA data, and field measurements. Diurnal curves were developed for each pressure zone using an hourly mass balance. The model was verified by comparing system operations with historical system operating data. Performed hydraulic analysis for different demand conditions and identified system improvements. A prioritized capital improvement plan was developed to meet distribution system needs for existing through buildout conditions.

AZUSA LIGHT AND WATER (ALW) – CA

Hydraulic Modeling Support

Project Engineer

Sedaru provides on-going modeling support for ALW in support of pipeline, pump station design projects, and system capacity evaluation. Evaluated the water system capacity to provide adequate pressures under different demand conditions for the proposed Raider Crater industrial development. Evaluated redundancy supply alternatives to serve the proposed development from adjacent pressure zones, performed hydraulic analyses, identified system deficiencies, and recommended system improvements. Developed system curves for the Vernon and 11th Street pump station for pump selection and design. Reviewed previous system analysis reports and validated findings and recommendations.

Experience: 6 Years

2017-Present

Sedaru

2015-2017

AECOM

2013-2014

URS Corporation

Key Skills:

- ✓ Model Building & Calibrating
- ✓ Network Analysis
- ✓ Asset Management
- ✓ Capital Improvement
- ✓ GIS (Esri)

Education & Certificates:

PH.D., Civil Engineering-
Water Resources

University of California, Irvine

Master of Science, Civil
Engineering- Hydraulic Studies
Sharif University of Technology

Bachelor of Science, Civil
Engineering
Sharif University of Technology

Professional Engineer
State of California #C79323

Additional Project Experience

LOS ANGELES DEPT. OF WATER & POWER (LADWP) – CA

Hydraulic Computer Model and Water Distribution Alternatives

Project Engineer

Sedaru is teamed with Arcadis to develop and calibrate the hydraulic model which will be used to gain system knowledge and insight, evaluate the hydraulic and water quality characteristics of the existing infrastructure, and make improvement recommendations to meet service goals and regulatory compliance. Ms. Khakbaz developed the hydraulic model for the Griffith Park water system using InfoWater which involved importing GIS-based data to the model, demand allocation, and model calibration and validation.

CITY OF SANTA ANA – CA

Targeted Uni-Directional Flushing Program

Project Engineer

Ms. Khakbaz developed UDF sequences for 3 areas of the City's water distribution system to pilot a UDF program using the City's existing hydraulic model in conjunction with a built-in tool in WaterCAD™ for UDF sequencing with the objectives of 1) reducing the amount of flushing water volume and costs associated with maintaining a suitable level of water quality and 2) removing sediment in the pipes through high velocity scouring of pipes.

CONSOLIDATED WATER WORKS DISTRICT NO. 1 (CWW) – LA

Water Model Build and Calibration

Project Engineer

Ms. Khakbaz developed a WaterCAD hydraulic model of the District's water distribution system from the District's GIS geodatabase, available facility schematics, and demand information from the water customer billing database. The model was calibrated against SCADA as well as historical hydrant flow data.

CITY OF NEWPORT BEACH – CA

Water Master Plan

Project Engineer

Sedaru is teamed with Arcadis to develop the City's Water Master Plan. Ms. Khakbaz developed the City's water distribution model in InfoWater using GIS data, customer billing information, and facility reference drawings. The model was calibrated under steady-state and EPS conditions using hydrant field test data and available SCADA.



Ramon Gallegos

Sedaru Implementation Manager/GIS Advisor

Highlighted Project Experience

RUBIO CANON LAND AND WATER ASSOCIATION (RCLWA) – CA

Enterprise Work Management

Implementation Manager

RCLWA has implemented Sedaru to support workflows including valve exercising, system flushing, water production data collection and reporting, and fire flow testing. Valve exercising will include integration to Pacific-Tek valve turning machine.

AZUSA LIGHT & WATER (ALW) – CA

Sedaru CMMS & Field Data Collection

Project Manager

ALW has deployed Sedaru to support water distribution and production inspections and maintenance. Sedaru is used by field crews and operations to manage valve exercising, hydrant maintenance, fire flow tests, facility meter reads, water production facility inspections, backflow repair, water sampling and more. Field crews are also using Sedaru to operate and automatically collect data from their Wachs Valve Machine. ALW is also using Sedaru Modeling to analyze their hydraulic model. They are implementing Sedaru CIP to enable dynamic master planning and asset management.

CITY OF POMONA – CA

Dynamic Asset Management & Field Data Collection

Implementation & Support Manager

Sedaru is deployed at the City of Pomona, supporting dynamic asset management and field data collection. The City is using Sedaru to manage hydrants, valves, meters, water production, and water treatment assets. In addition, sewer main maintenance and manhole inspections are managed in Sedaru. Sedaru is also working with the City to develop and update the City's Utility Strategic Plan in Sedaru CIP. This plan acts as a dynamic master plan, helping to prioritize asset maintenance and replacement.

Experience: 15 Years

2016-Present

Sedaru

2004-2016

EEC Environmental

Key Skills:

- ✓ GIS (Esri)
- ✓ Data Analysis
- ✓ Enterprise Integration
- ✓ Database Systems
- ✓ Project Management
- ✓ Process Automation
- ✓ Field Workflows

Education & Certificates:

Master of Arts- Geography
California State University,
Fullerton

Bachelor of Arts- Geography
California State University,
Fullerton

Additional Project Experience

COUNTY OF VENTURA PUBLIC WORKS – CA

GIS Build & Sedaru CMMS

Project Manager

Ventura is using Sedaru to manage workflows and build GIS. Sedaru is building and augmenting its water, sewer, and recycled water GIS layers. Sedaru will also manage the county's water distribution and sewer maintenance activities, enabling office staff and field workers to streamline work management and field data collection. Sedaru will integrate with Digalert to optimize the County's management of call before your dig tickets. In the field, the Sedaru integration to the County's Wachs Valve Machine will automate data collection from their valve exercising program.

EAST ORANGE COUNTY WATER DISTRICT (EOCWD) – CA

GIS Build & Sedaru CMMS

GIS and Sedaru Implementation Manager

Sedaru built the District's water GIS, build and calibrated their hydraulic model, and deployed Sedaru CMMS with field mobility for its water and wastewater system. Sedaru built the District's GIS utilizing Esri's local government information model (LGIM) to ensure topology, then trained and deployed a successful enterprise field mobile solution across all water & wastewater system assets.

CITY OF SANTA ANA – CA

Water Production and Advanced Reporting

Project Manager

City is collecting water production field data with Sedaru. Sedaru OMNI uses the production data to automate and manage water production reports. Sedaru worked directly with City staff to identify KPIs and optimize data capture and reporting workflows.

CITY OF COACHELLA – CA

GIS Build & Sedaru Outage

Project Manager

City is using Sedaru to manage day to day operations for water distribution and wastewater. Sedaru staff built the City's GIS from existing AutoCAD drawings, as-builts, and field redlines. Sedaru staff worked with the City to identify and optimize key workflows and KPIs. Sedaru also configured Sedaru Outage to help plan and manage water related outage. Sedaru Outage plays a key role in how the City communicates planned outage information with public.