AGENDA FOR A REGULAR MEETING OF THE BOARD OF DIRECTORS
OF THE VALLECITOS WATER DISTRICT
WEDNESDAY, OCTOBER 18, 2017, AT 5:00 P.M.
AT THE DISTRICT OFFICE
201 VALLECITOS DE ORO, SAN MARCOS, CALIFORNIA

CALL TO ORDER – PRESIDENT ELITHARP

PLEDGE OF ALLEGIANCE

ROLL CALL

In the case of an emergency, items may be added to the Agenda by a majority vote of the Board of Directors. An emergency is defined as a work stoppage; a crippling disaster; or other activity which severely imperils public health, safety, or both. Also, items which arise after the posting of the Agenda may be added by a two-thirds vote of the Board of Directors.

ADOPT AGENDA FOR THE REGULAR MEETING OF OCTOBER 18, 2017

PUBLIC COMMENT

Persons wishing to address a matter not on the Agenda may be heard at this time; however, no action will be taken until the matter is placed on a future agenda in accordance with Board policy. Public comments are limited to three minutes. A Request to Speak form is required to be submitted to the Executive Secretary prior to the start of the meeting, if possible. Public comment should start by stating name, address and topic. The Board is not permitted during this time to enter into a dialogue with the speaker.

NOTICE TO THE PUBLIC

All matters listed under the Consent Calendar will be voted upon by one motion. There will be no separate discussion of these items, unless a Board member or member of the public requests that a particular item(s) be removed from the Consent Calendar, in which case it will be considered separately under Action Items.

CONSENT CALENDAR

1.1 APPROVAL OF MINUTES (pp. 5-15)

A. REGULAR BOARD MEETING – OCTOBER 4, 2017
B. ENGINEERING/EQUIPMENT COMMITTEE MEETING – OCTOBER 9, 2017

Approved minutes become a permanent public record of the District.

Recommendation: Approve Minutes

1.2 WARRANT LIST THROUGH OCTOBER 18, 2017 – $1,674,183.86 (pp. 16-18)

Recommendation: Approve Warrant List

1.3 FINANCIAL REPORTS (pp. 19-31)

A. WATER METER COUNT – SEPTEMBER 30, 2017
B. WATER PRODUCTION/SALES REPORT – 2017/2018
C. QUARTERLY FINANCIAL REPORT – SEPTEMBER 30, 2017
D. WATER REVENUE AND EXPENSE REPORT – SEPTEMBER 30, 2017
E. SEWER REVENUE AND EXPENSE REPORT – SEPTEMBER 30, 2017
F. RESERVE FUNDS ACTIVITY – SEPTEMBER 30, 2017
G. INVESTMENT REPORT – SEPTEMBER 30, 2017

1.4 OPERATIONS & MAINTENANCE METRICS QUARTERLY REPORT – SEPTEMBER 30, 2017 (pp. 32-39)

1.5 FINAL ACCEPTANCE OF WATER AND SEWER IMPROVEMENTS FOR EASTGATE, APN'S 219-270-70, 71, 72 & 73 (AFFIRMED HOUSING GROUP) (pp. 40-42)

Installation of water and sewer facilities has been completed.

Recommendation: 1) Accept Project Improvements; 2) Approve Filing of a Notice of Completion

1.6 PROJECT ACCEPTANCE OF LIFT STATION NO. 1 WET WELL ROOM REPAIRS (pp. 43-45)

All construction has been completed.

Recommendation: 1) Accept Project; 2) Authorize Filing of a Notice of Completion; 3) Authorize Release of Retention Funds to Contractor Following 60-Day Notice Period, Provided No Claims are Filed

*******END OF CONSENT CALENDAR*******

ACTION ITEMS

2.1 SENATE BILL 555 BY SENATOR LOIS WOLK (D-DAVIS) – URBAN RETAIL WATER SUPPLIERS: WATER LOSS MANAGEMENT (pp. 46-78)

California Senate Bill 555 requires urban water suppliers to submit a completed and validated water loss audit annually to the California Department of Water Resources.

Recommendation: For Information Only

2.2 LEGAL SERVICES SOLICITATION (pp. 79-88)

District Resolution No. 1484 requires vendors supplying annual services in an amount of $100,000 or greater in any one fiscal year to provide a bid for similar services every five years.

Recommendation: Request Board direction

2.3 ACWA ELECTION OF OFFICERS (pp. 89-94)

Election of ACWA President and Vice President will be conducted at the ACWA General Session Membership Meeting on November 29, 2017.

Recommendation: Request Board direction on Board member authorized to vote on behalf of the District

*****END OF ACTION ITEMS*****

REPORTS

3.1 GENERAL MANAGER

3.2 DISTRICT LEGAL COUNSEL

3.3 SAN DIEGO COUNTY WATER AUTHORITY

3.4 ENCINA WASTEWATER AUTHORITY
- Capital Improvement Committee
- Policy and Finance Committee

3.5 STANDING COMMITTEES

3.6 DIRECTORS REPORTS ON MEETINGS/CONFERENCES/SEMINARS ATTENDED

*****END OF REPORTS*****

OTHER BUSINESS

4.1 MEETINGS

*****END OF OTHER BUSINESS*****

5.1 DIRECTORS COMMENTS/FUTURE AGENDA ITEMS

*****END OF DIRECTORS COMMENTS/FUTURE AGENDA ITEMS*****

6.1 ADJOURNMENT

*****END OF AGENDA*****

If you have any disability which would require accommodation in order to enable you to participate in this meeting, please call the Executive Secretary at 760.744.0460 ext. 264 at least 48 hours prior to the meeting.

Audio and video recordings of all Board meetings are available to the public at the District website www.vwd.org

AFFIDAVIT OF POSTING

I, Diane Posvar, Executive Secretary of the Vallecitos Water District, hereby certify that I caused the posting of this Agenda in the outside display case at the District office, 201 Vallecitos de Oro, San Marcos, California by 4:00 p.m., Thursday, October 12, 2017.

_____
Diane Posvar

MINUTES OF A REGULAR MEETING OF THE BOARD OF DIRECTORS
OF THE VALLECITOS WATER DISTRICT
WEDNESDAY, OCTOBER 4, 2017, AT 5:00 PM AT THE DISTRICT OFFICE,
201 VALLECITOS DE ORO, SAN MARCOS, CALIFORNIA

President Elitharp called the Regular meeting to order at the hour of 5:00 p.m.

Director Martin led the pledge of allegiance.

Present:	Director Elitharp Director Hernandez Director Martin Director Sannella
Absent:	Director Evans
Staff Present:	General Manager Pruim Assistant General Manager Scaglione Legal Counsel Jackson District Engineer Gumpel Operations & Maintenance Manager Pedrazzi Accounting Supervisor Owen Executive Secretary Posvar

ADOPT AGENDA FOR THE REGULAR MEETING OF OCTOBER 4, 2017

17-10-01 MOTION WAS MADE by Director Martin, seconded by Director Sannella, and carried unanimously, with Director Evans absent, to adopt the agenda for the Regular Board Meeting of October 4, 2017.

PUBLIC COMMENT

None.

CONSENT CALENDAR

17-10-02 MOTION WAS MADE by Director Martin, seconded by Director Sannella, and carried unanimously, with Director Evans absent, to approve the Consent Calendar as presented.

1.1 Approval of Minutes

A. Regular Board Meeting – September 20, 2017

1.2 Warrant List through October 4, 2017 - $3,921,948.73

ACTION ITEMS

ORDINANCE ESTABLISHING RATES, RULES AND REGULATIONS FOR WATER SERVICE RATE INCREASE

General Manager Pruim stated an ordinance establishing the water and sewer rates for calendar years 2018 and 2019 was presented to the Board for adoption. A public hearing to consider the rates was noticed and held at the Vallecitos Water District on Wednesday, September 20, 2017 in accordance with Proposition 218. The rates and charges were developed based on a Cost of Service and Rate Structure Study approved by the Board on June 7, 2017. The Board considered written protest, heard public comments at the hearing, and approved the proposed rate changes. The proposed ordinance formally establishes the new rates.

Staff recommended the Board adopt the ordinance establishing water rates for 2018 and 2019.

Mike Hunsaker, member of the public, addressed the Board questioning the rate structure for small agriculture where the first 26 units of water are charged at the residential rate and the agricultural rate applies thereafter. He asked what happens when there is a drought and restrictions on water use, and what happens to their ability to get the ag water if they can't use the first 26 units. He thanked the Board.

Assistant General Manager Scaglione stated that regardless of the size of the agriculture, when combined domestic and agriculture water is flowing through one meter, the first 26 units of water are charged at the residential rate. The District does not have a drought rate; the rate is the same during times of drought.

17-10-03 MOTION WAS MADE by Director Martin, seconded by Director Hernandez, and carried unanimously, with Director Evans absent, to adopt the ordinance.

Ordinance No. 207 – The roll call vote was as follows:

AYES: Hernandez, Martin, Sannella, Elitharp
NOES:
ABSTAIN:
ABSENT: Evans

RECLASSIFY VACANT SENIOR ELECTRICAL/INSTRUMENTATION TECHNICIAN POSITION TO CONTROL SYSTEMS TECHNICIAN

General Manager Pruim stated District management routinely reviews staffing levels and job titles, and when the type of work performed and skills set changes, sometimes there is a need for reclassification. Additionally, as new technology allows more control of processes at remote facilities, it reduces the need to send staff to the remote facilities

to monitor and control the performance of those facilities.

General Manager Pruim further stated an opportunity to increase efficiency and cost savings was recently identified when a Senior Electrical/Instrumentation Technician position became vacant on July 8, 2017 due to retirement. The District has three Electrical/Instrumentation Technicians of which the senior position currently performs electrical work as well as some work on the Supervisory Control and Data Acquisition (SCADA) system. SCADA programming is currently outsourced to private contractors; however, it is becoming increasingly difficult and more expensive to obtain these services in a timely fashion due to a shortage of qualified contracting firms.

The Operations and Maintenance Manager and Mechanical/Electrical Supervisor reviewed the needs of the department and determined the Senior Electrical/Instrumentation Technician position could be better utilized by including SCADA programming duties in addition to electrical work. Once filled, this position will allow staff to catch up on a backlog of SCADA programming and stay on top of the SCADA workload going forward. After the backlog of programming work is completed, the reclassified position would spend at least 75% of the time performing programming and 25% on electrical duties. The remaining electrical work will continue to be distributed among existing staff and augmented with contractors for large capital projects. The salary range for the recommended position will be the same as the current position.

Staff recommended the Board approve the reclassification of the existing vacant Senior Electrical/Instrumentation Technician to a Control Systems Technician and adopt the revised salary schedule to comply with requirements of the California Public Employees' Retirement System.

General discussion took place.

17-10-04 MOTION WAS MADE by Director Hernandez, seconded by Director Martin, and carried unanimously, with Director Evans absent, to approve the reclassification and adopt the revised salary schedule.

PROFESSIONAL SERVICES AGREEMENT FOR OUTSIDE SERVICES TO PROVIDE EXTERNAL INFORMATION TECHNOLOGY MANAGEMENT

General Manager Pruim stated an additional opportunity for cost savings and improved efficiency was identified with the recent retirement of the Information Technology (IT) Supervisor. The IT Supervisor position is responsible for overseeing the IT department, including network administration, internal application development and technical support, as well as supervising assigned staff. The District has an existing contract with Ostari, a consulting firm that provides IT support in the areas of infrastructure monitoring, help desk and network support.

General Manager Pruim further stated the proposed Professional Services Agreement with Ostari is for a term of one year to provide technical administrative support, administrative support, and account management. Supervisory responsibility should not be contracted out and has been reassigned to the Administrative Services Manager. The District will reassess the need to fill the IT Supervisor position after the first three months and determine if the services should continue for the remaining length of the term. The cost of the agreement with Ostari to provide external IT management services is $7,500 per month, for a total of $90,000 if the agreement continues for one year which could save over $100,000 per year.

Staff recommended the Board approve the Professional Services Agreement with Ostari.

General discussion took place. During general discussion, Director Hernandez requested a report be provided to the Board after the 90-day period containing a recommendation of whether to continue with the one-year contract or go in another direction.

Mike Hunsaker, member of the public, addressed the Board asking who is responsible for the maintenance of the District's website and billing system, and if there will be any software changes. He thanked the Board.

General Manager Pruim stated no software changes are proposed in the agreement; however, Ostari may make recommendations as needed. Staff currently maintains the content in the website and will continue to do so.

17-10-05 MOTION WAS MADE by Director Martin, seconded by Director Sannella, and carried unanimously, with Director Evans absent, to approve the Professional Services Agreement with Ostari.

REPORTS

GENERAL MANAGER

General Manager Pruim reported the following:

- Staff recently released a Request for Proposal inviting companies to submit proposals to identify solar electricity generating opportunities. The firm selected will not be constructing facilities, but will serve as a technical advisor to review opportunities and the cost/benefit analysis, and help the District select an option if they choose to move forward.
- Water utilities are required to clean and inspect their water storage reservoirs and tanks on a regular basis. A diving company has been retained to perform the inspection and cleaning of some of the District's facilities. All facilities are inspected on a rotating three-year cycle. The 33-million-gallon tank in Twin Oaks is scheduled to be inspected tomorrow.

- It is expected that 90% of the men's locker room plans will be received at the end of this month. After staff reviews the plans and provides comments to the consultant, the final plans will be prepared and staff will move forward with advertising the project.
- The Engineering/Equipment Committee will meet on Monday, October 9 at 2:00 p.m. at which updates on the solar, locker room, and groundwater projects will be provided as well as information on local development.
- The Public Awareness/Personnel/Policy Committee will meet on Monday, October 16 at 3:00 p.m. to discuss the 48-hour disconnect policies in practice as well as the billing discrepancy policy.
- A Finance/Investment Committee meeting is scheduled for Thursday, October 26 at 4:00 p.m.

DISTRICT LEGAL COUNSEL

None.

SAN DIEGO COUNTY WATER AUTHORITY

None.

ENCINA WASTEWATER AUTHORITY

Director Hernandez stated he had nothing new to report on the Capital Improvement Committee meeting.

Director Elitharp stated the Policy & Finance Committee has not met since the last Board meeting.

STANDING COMMITTEES

None.

DIRECTORS REPORTS ON TRAVEL/CONFERENCES/SEMINARS ATTENDED

Directors Martin and Elitharp reported on their attendance to the California Special District Association (CSDA) Conference at Monterey last week.

Director Hernandez reported on his participation in a CSDA committee meeting regarding their video contest.

OTHER BUSINESS

None.

DIRECTORS COMMENTS/FUTURE AGENDA ITEMS

None.

ADJOURNMENT

There being no further business to discuss, President Elitharp adjourned the Regular Meeting of the Board of Directors at the hour of 5:41 p.m.

A Regular Meeting of the Vallecitos Water District Board of Directors has been scheduled for Wednesday, October 18, 2017, at 5:00 p.m. at the District office, 201 Vallecitos de Oro, San Marcos, California.

Craig Elitharp, President
Board of Directors
Vallecitos Water District

ATTEST:

Glenn Pruim, Secretary
Board of Directors
Vallecitos Water District

MINUTES OF A MEETING OF THE
ENGINEERING/EQUIPMENT COMMITTEE
OF THE VALLECITOS WATER DISTRICT
MONDAY, OCTOBER 9, 2017 AT 2:00 P.M.
AT THE DISTRICT OFFICE, 201 VALLECITOS DE ORO,
SAN MARCOS, CALIFORNIA

Director Hernandez called the meeting to order at the hour of 2:00 p.m.

Present: Director Hernandez
Director Elitharp
General Manager Pruim
District Engineer Gumpel
Development Services Senior Engineer Scholl
Administrative Secretary Johnson

ITEMS FOR DISCUSSION

MEN'S LOCKER ROOM UPDATE

District Engineer Gumpel stated staff has negotiated with Jeff Katz Architecture to amend the men's locker room project as directed by this Committee and the Board. The project amendment has been finalized for $22,935. He expects 100% submittal by the end of October and anticipates presenting the plans to the Committee or full Board in November. Other important dates are the bid date in December, Board award date in January 2018, and start of construction in March 2018.

General discussion took place regarding the construction schedule and engineer's estimates, both of which are not available at this time. This Committee will have the opportunity to review the project before it goes out for bid.

Staff will provide further updates at the November Committee meeting to include the submittal and possibly staff's markups.

SOLAR REQUEST FOR PROPOSAL UPDATE

District Engineer Gumpel stated a pre-proposal meeting is scheduled for Thursday, October 12. Five consultants interested in representing the District to evaluate, negotiate, and oversee installation of a solar program have been invited to the meeting. Proposals are due November 1 at 4:00 p.m. Depending on the size and scope, interviews may be conducted in mid-November, and he anticipates awarding a contract in January 2018. Further updates to this Committee or the Board will likely be provided in December.

General discussion took place.

Staff will email the list of consultants invited to the pre-proposal meeting to the Committee.

GROUNDWATER REQUEST FOR PROPOSAL UPDATE

District Engineer Gumpel stated that at the last Committee meeting, groundwater options were discussed and staff was directed to seek out a consultant to assist the District in securing funding for a groundwater study. Because RMC Consulting, Inc. (RMC) represents the District through the North County Recycled Water Coalition and works with EWA's water resources plan, it made sense to work with RMC to pursue funding sources for the District.

District Engineer Gumpel is expecting to receive scope and fee information soon from RMC as to the cost of trying to obtain outside funding for a groundwater study and the proper documentation necessary to do so.

Mike Hunsaker, member of the public, asked what the groundwater objective is. Director Hernandez responded that the District is seeking funding to pay for a groundwater feasibility study.

District Engineer Gumpel will forward the scope and fee information from RMC to General Manager Pruim when it has been received.

LOCAL DEVELOPMENT UPDATE

Development Services Senior Engineer Scholl provided a spreadsheet listing development projects and a map indicating where the projects are located. The projects listed on the spreadsheet are grouped into projects currently under construction, in plan check, and in planning. Project information includes acreage, project type, dwelling units, and water and sewer EDUs.

General discussion took place regarding several projects on the list.

District Engineer Gumpel noted that the number of dwelling units are going to be built irregardless of what type of units they are, and that water EDUs and dwelling units don't always match. For example, water EDUs will be closer to the number of dwelling units for single-family units than for multi-family units.

General discussion took place regarding funds associated with the developer fees that will be collected from these projects. Those capital fees will pay for existing debt on growth and new infrastructure as needed in the future. Director Hernandez requested staff provide him information on the amount of money coming in.

District Engineer Gumpel pointed out that just because a project is on the planning list, that doesn't mean the project has been approved by the appropriate land-use body. Some projects in planning never get built or may come back completely different.

Staff will provide local development updates to the Committee on a quarterly basis.

OTHER BUSINESS

Director Hernandez requested an update on the District's property behind the District office. General Manager Pruim stated letters were mailed regarding the surplus property. He received a phone call from the San Marcos School District that they are interested in the property as a possible school site. Director Hernandez received a call from a representative of a charter school that is interested in the property as well. General Manager Pruim stated he has not heard from the City or parks department.

Director Hernandez asked when the San Diego County Water Authority will be voting on the Water Fix. General Manager Pruim stated the vote hasn't occurred yet.

Director Hernandez asked if the District has finalized the sale of the property near the lake to the developer. General Manager Pruim stated the sale has not been finalized.

Director Hernandez inquired about the status of the District's avocado grove. General Manager Pruim stated he does hear from interested parties from time to time, but as directed by the Board, he's told them the District is not interested in selling the property.

PUBLIC COMMENT

None.

ADJOURNMENT

There being no further business to discuss, the meeting was adjourned at the hour of 2:41 p.m.

ATTACHMENTS:
1 – Project List
2 – Project Map

PROJECT STATUS

CONSTRUCTION

			Acres	Project Type	Dwelling Units	Water EDUs	Sewer EDUs
SAN MARCOS CREEK DISTRICT							
1	**A**	Eastgate	2.85	MU (RET/MF)	42	22.5	35
	B	Main Square	4.55	MF	500	205	402
UNIVERSITY DISTRICT							
2	**A**	UDSM - Block C	2.93	MU (RET/MF)	199	94	172
	B	UDSM - Block F	3.34	MF	144	60	108
	C	UDSM - Block K	0.64	MF	68	28	55
	D	UDSM - Block F (Urge)	1.32	COMM		8	16
	E	UDSM - PIMA	1.04	OFF PROF		12	18
	F	UDSM - Block 3	3.09	MU (RET/OFF/SH)	60	32	56
3		Vista Palomar	17.17	MF	191	133	240
				HOTEL	100	15	30
4		Corner @ 2 Oaks	19.16	MF	116	32	58
				HOTEL	129	60	79
5		San Elijo Town Center	2.64	COMM/MF	12	8	12
6		Montessa	4.88	SF	19	21	19
7		Rancho Coronado	230	SF	346	374	346
8		High Point	491	SF	38	38	4

PLAN CHECK

		Acres	Project Type	Dwelling Units	Water EDUs	Sewer EDUs
9	Meadowlark Canyon	16.38	SF	33	44.5	33
10	Borden 22	3.96	SF	22	23	22
11	Palisades Estates	383.9	SF	55	55	0
12	Rancho Coronado MU Site	22.6	MF	220	127	190

PLANNING

			Acres	Project Type	Dwelling Units	WATER EDUs	SEWER EDUs
RICHMAR SPA							
13	**A**	Villa Serena	4.06	MF	148	57	102
	B	El Dorado II	3.78	MF	86	55	98
	C	Richmar Station	5.18	MF	141	68	127
	D	Fitzpatrick Apartments	7.1	MF	78	48	69
	E	Mariposa II	8.14	MF	200	98	147
14		Sears Site Redevelopment	2.72	MU (RET/MF)	82	40	63
15		Fenton Development	87.46	MF	250	250	250
16		Sandy Lane	8.19	SF	9	9	9
17		Hotel Leora Lane	1.6	HOTEL	129	32	64
18		Montiel Road 9-lot Subdivision	2.7	SF	9	9	9
19		Borden Road Residential	17.56	SF/MF	34/22	44	48
20		Cherimoya Subdivision	9.18	SF	13	13	13
21		San Marcos Highlands	66.53	SF	189	189	189
22		Rancho Lomas Verde	309	SF	153	153	0
23		Bieri - Questhaven	68.84	MF & SF	327/41	252	389
24		Murai Development	91.65	SF	89	138	121
25		La Moree Subdivision	5.5	SF	8	0	8
26		Nordahl Road Subdivision	3.8	SF	15	16	15
27		Newland Sierra	1985	SF/MF	1137/998	2900	2141

PROJECT STATUS

N.T.S.

22
RANCHO LOMAS VERDES

11
PALISADES ESTATES

27
NEWLAND SIERRA

8
HIGH POINT

7
RANCHO CORONADO

WULFF

PALOMAR
COLLEGE

VWD

CAL STATE
SAN MARCOS

RIDGELINE

MRF

TWIN OAKS VALLEY RD

DEER SPRINGS RD

MISSION RD

SAN MARCOS BLVD

RANCHO SANTA FE RD

SAN ELIJO HILLS RD

S.M. CREEK DISTRICT

UNIVERSITY DISTRICT

RICHMAR SPA

1A 1B 2A 2B 2C 2D 2E 2F 3 4 5 6 9 10 12 13A 13B 13C 13D 13E 14 15 16 17 18 19 20 21 23 24 25 26

78

15

Vallecitos Water District

LEGEND

- PROJECTS IN PLANNING
- PROJECTS PLANCHECK
- PROJECTS IN CONSTRUCTION

I:\GIS\Map layouts\Departments\Engineering\Development Services\Project Maps\Project & Inpection Status_NEW.mxd

Item 1.1
Printed: 10/9/2017

VALLECITOS WATER DISTRICT
WARRANTS LIST
October 18, 2017

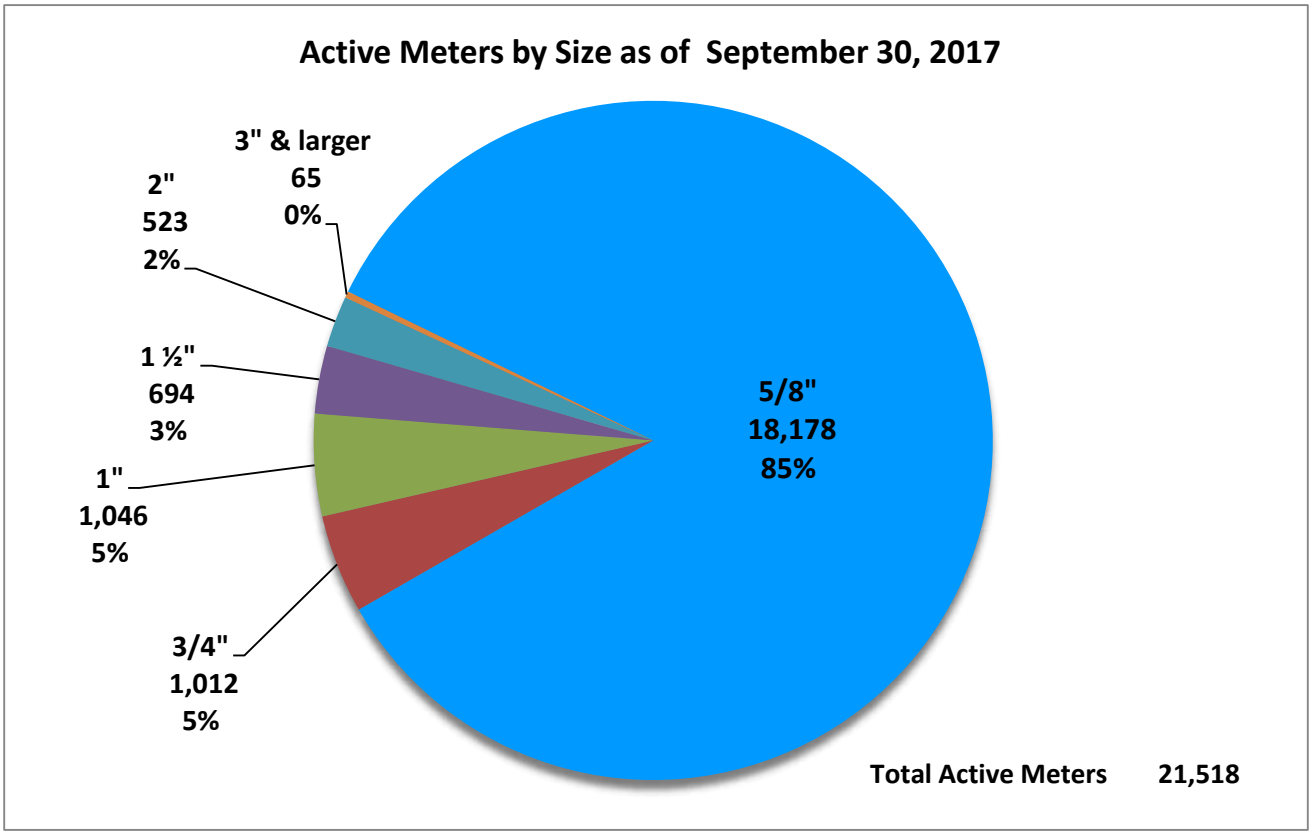
PAYEE	DESCRIPTION	CHECK#	AMOUNT
CHECKS			
State of California	Electronic Filing - Forms 645 & 630	112001	770.00
Calolympic Safety	Helmet Cooler Fan	112002	165.57
Ken Grody Ford	F550 Duty Truck Prj 20181-29	112003	43,990.26
Ken Grody Ford	Shipping F550 Duty Truck Prj 20181-29	112004	1,200.00
Bens Asphalt & Maintenance Co Inc	Water Main Breaks	112005	48,000.00
Pitney Bowes	Postage Meter Refill	112006	32.63
SDG&E	Power Sept	112007	73.41
Garnishments	Payroll Garnishments 11208 through	112010	-
ACWA/Joint Powers Insurance	Liability Insurance Renewal 17-18	112011	228,897.00
Adobe Lock & Safe	2 Door Locks Bldg C	112012	989.12
Agri Service Inc	Mulch Prj 20181-503	112013	125.00
Air Pollution Control District	Emission Fee Renewal	112014	510.00
Alisha Terhufen	Closed Account Refund	112015	41.25
Kevin Anctil	SWRCB Cert Renewal Anctil	112016	140.00
Aqua-Metric Sales Co	Meters 5, Measuring Chambers 61	112017	6,968.19
AT&T	Phone Svc Sept	112018	2,968.51
Bernard D Chapman	Closed Account Refund	112019	772.20
Best Best & Krieger	2015 General Rate Case	112020	243.00
Boncor Water Systems	Soft & Drinking Water Svc Oct	112021	1,645.00
Boot Barn	Safety Boots	112022	129.29
Cathy Strother	Closed Account Refund	112023	52.70
City of San Diego	AED Program Management 17-19	112024	200.00
Council of Water Utilities	Meeting 10-17-17, Elitharp, Evans, Hernandez, Martin, Sannella, Pruim, Scaglione, Guest	112025	200.00
County of San Diego	Recording Fees Aug & Sept	112026	142.60
Craig Elitharp	CSDA Conference 9-25-17	112027	1,194.29
CWEA	Membership J Halbig	112028	180.00
DirecTV Inc	Satellite Svc Oct	112029	69.54
Douglas & Janice Zieman	Easement Acquisition Prj 20161-26	112030	7,500.00
Craig Durban	Prescription Safety Glasses	112031	275.00
EDCO Waste & Recycling Serv	Trash Svc Sept & Oct	112032	870.82
ESRI Inc	ArcGIS Term Licenses 8 Total 17-18	112033	2,000.00
Eurofins Eaton Analytical Inc	Algae Analysis Mahr	112034	630.00
Ewing Irrigation Products	PVC Supplies	112035	432.64
G & R Auto & Truck Repair Inc	Brake Replacement Veh 240	112036	1,954.35
George & Krogh Welding Inc	Weld Sedimentary Basin Actuators MRF - 7	112037	2,310.00
Golden State Graphics	Fall Splash Prj 20181-43	112038	3,533.12
Haldan Liew	Closed Account Refund	112039	93.91
James R Hernandez	WEF Head Quarters Tour 9-12-17, COWU Meeting 9-19-17	112040	166.47
Home Depot Credit Services	Hardware Supplies Sept	112041	285.65
Infinisource	Admin Svcs Oct	112042	156.60
Infrastructure Engr Corp	South Lake Pump Station Prj 20161-107, NCTD Sewer Crossing Prj 20161-11	112043	5,296.00
Jean Sweeney	Closed Account Refund	112044	100.00
Jennifer Cloney-Smith	Closed Account Refund	112045	9.48
John De Mello	Closed Account Refund	112046	160.43
JCI Jones Chemicals Inc	Chlorine	112047	1,944.35
Kay Almanza	Closed Account Refund	112048	24.49
Knight Security & Fire Systems	Monitoring, Patrol, Answering Svc Oct, Svc To Equipment Room Door Bldg A	112049	781.61
Law Offices of Jeffrey G Scott	Legal Svcs Sept	112050	9,601.50
Lawnmowers Plus Inc	Supplies For Weed Removal, Chainsaw Repair	112051	516.78
Lisa & Andy Avila	Closed Account Refund	112052	43.64
Lisa Hanly	Error On VWD Payment Amount	112053	981.70
Lloyd Pest Control	Pest Control Aug	112054	110.00
Luis A Farfan	Closed Account Refund	112055	12.71
Major League Pest	Bee Removal	112056	240.00
Mallory Safety & Supply, LLC	Safety Supplies	112057	1,525.42
Hal Martin	COWU Meeting 9-19-17, CSDA Conference 9-25-17	112058	434.12
Morton Salt, Inc.	Industrial Salt	112059	3,516.93
New Pointe Communities, Inc.	Closed Account Refund	112060	752.78
Norberto A & May M Pablo	Closed Account Refund	112061	103.91
North County Auto Parts	Fleet Supplies Sept	112062	1,452.11
O.G. Supply Inc	Hardware Supplies	112063	142.73
Patricia Landoni	Closed Account Refund	112064	89.93

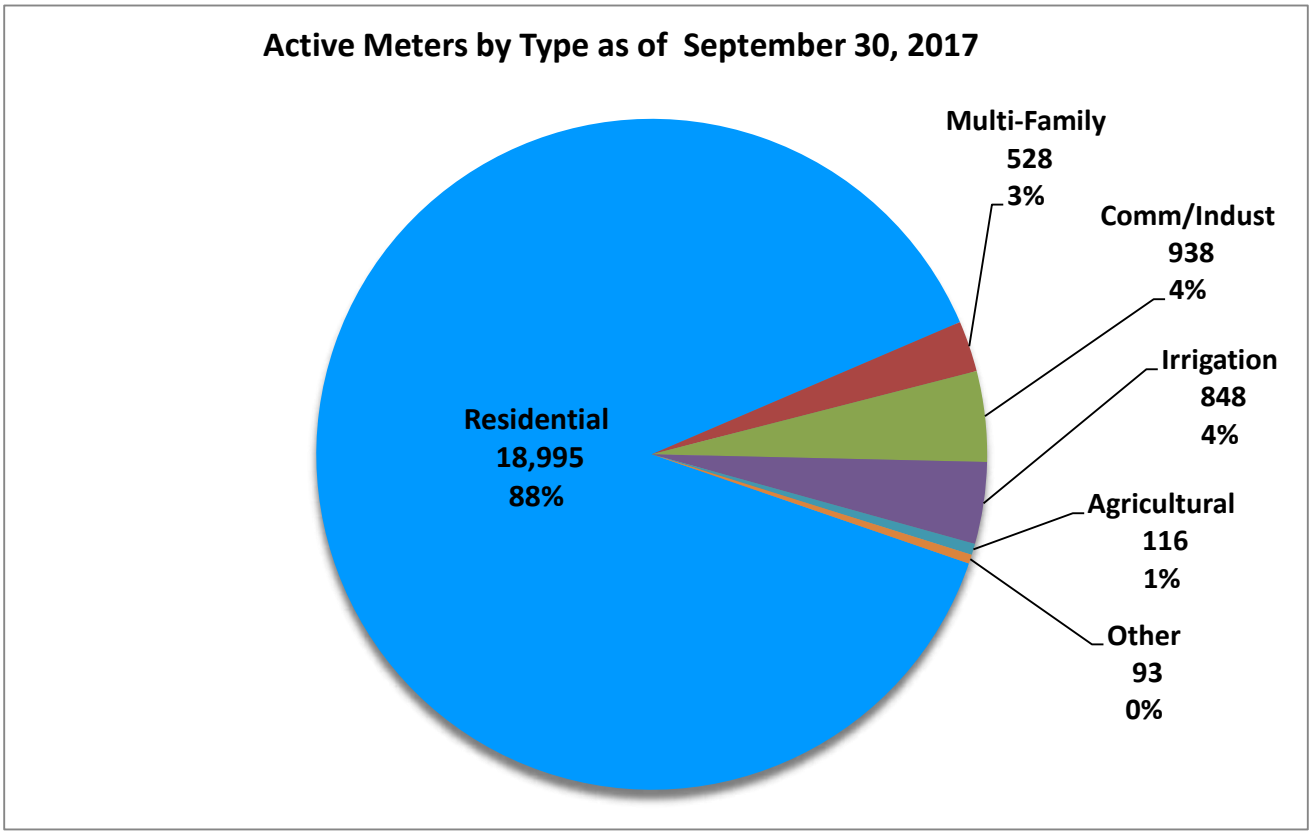
PAYEE	DESCRIPTION	CHECK#	AMOUNT
Pencco, Inc.	Trioxyn, Sulfend RT	112065	14,236.03
Pitney Bowes	Mail System Lease Aug - Oct	112066	641.16
Plumbers Depot Inc	Wear Parts For Vactors, & Additional Parts For Stock, Leader Hose	112067	3,009.84
Rick Post Welding	Welding Svc - Emergency Main Break	112068	1,179.94
Red Back USA	Safety Boots	112069	149.78
Rexel Inc	Motor Controller School House Pump Station, Hardware Supplies	112070	6,459.25
Ron Plumb	Closed Account Refund	112071	21.00
Rupe's Hydraulics	Hardware Supplies	112072	253.49
Steven Saavedra	CWEA Membership & Cert Renewal - S Saavedra	112073	270.00
Saima Haroon	Closed Account Refund	112074	71.97
SDG&E	Power Sept	112075	47,969.19
San Marcos Trophy	Engraving Svc - Name Plate	112076	6.00
Southern Counties Lubricants, LLC	Oil	112077	192.66
Sparling Instruments LLC	Calibrate Flow Meters - CSUSM	112078	764.80
Standard Insurance Company	LTD, LIFE, ADD, SUPP LIFE, Sept	112079	6,374.80
State Board Of Equalization	Underground Storage Tank Fees July - Sept	112080	254.52
State of California	Dept of Pesticide Regulation Applicator Cert J Mendoza	112081	60.00
State Water Resources Control	Membership E Garcia	112082	80.00
T.S. Industrial Supply	Hardware Supplies	112083	380.61
Temecula Valley Pipe & Supply	Cla Val Parts MRF	112084	1,273.78
Total Resource Mgt Inc	Maximo Support Aug	112085	7,824.00
Dean Toth	CWEA Cert Renewal	112086	90.00
Traffic Supply Inc	Custom Signs	112087	91.56
Union Bank FKA 1st Bank Card	Meetings & Travel Sept	112088	2,909.50
Union Bank FKA 1st Bank Card	Meetings & Travel Sept	112089	1,222.60
Union Bank FKA 1st Bank Card	Meetings & Travel Sept	112090	976.26
Union Bank FKA 1st Bank Card	Meetings & Travel Sept	112091	47.04
Univar USA Inc	Sodium Hypo Liquichlor, Sodium Bisulfite	112092	2,780.71
UPS	Shipping - Sept	112093	53.77
Wermers Multi Family Corp	Closed Account Refund	112094	688.41
Nu Concepts	Portable Restroom Trailers 2 Prj 20181-41	112095	15,509.02
AP Technology LLC	Secure Check Maintenance 17-18	112096	995.00
B & C Crane Service Inc	Crane Rental	112097	688.75
Backflow Solutions, Inc.	Backflow Reports 297 Total - Sept	112098	3,846.15
Barrett Engineered Pumps	Replacement Pump Parts PS2 MRF	112099	1,071.84
Clairemont Equipment Rent Inc	Hardware Supplies	112100	447.69
Coast Equipment Rentals	Dump Truck Rental	112101	2,165.60
Jeffrey Colwell	Video Production Prj 20181-44	112102	402.75
Charles P Crowley Co Inc	Injection Pump MRF	112103	9,094.10
Doane & Hartwig Water Systems Inc	Chlorine Regulator Rebuild Parts	112104	796.52
Hidden Valley Steel & Scrap, Inc.	Hardware Supplies	112105	275.99
Electrical Sales Inc	Hardware Supplies	112106	199.95
Endress & Hauser Inc	Flow Meter Calibration - TORF	112107	1,988.00
Ferguson Enterprises, Inc	Gate Valves, AV Enclosures	112108	2,115.16
Fisher Scientific LLC	Nitrate Test Strips, Lab Supplies MRF	112109	1,660.31
Flag Mart	US & State of CA Flags 6	112110	455.46
Freedom Automation Inc	Svc Calls 8 - MRF, Twin Oaks, Res, Water Ops, Lake San Marcos, Palos Vista PS, Coll D	112111	11,625.00
Freeway Trailer Sales	Hardware Supplies	112112	126.47
Grainger Inc	Saw Blades, Water Hose, Buckets, Hardware Supplies	112113	1,112.44
Hach Company	Water Quality Supplies	112114	2,095.30
Harrington Industrial	Chlorine Analyzer Pump MRF, Chlorine Analyzer Supplies MRF, Hardware Supplies	112115	1,192.25
Hawthorne Machinery Co.	Backhoe Hoses Veh 193	112116	407.06
Interstate Batteries	Batteries 3 Veh 198 & 253	112117	368.11
Matheson Tri-Gas Inc	Cylinder Rental	112118	18.04
Bens Asphalt & Maintenance Co Inc	2 Main Breaks - 864 Sq Ft.	112119	10,900.00
MGM Plastics Inc	Hardware Supplies	112120	308.17
Mission Resource Conservation District	Water Use Evaluations 13 Prj 20181-46	112121	1,000.00
O' Connell Engineering & Construction, Inc	LS2 Wet Well Room Prj 20171-4	112122	35,702.12
Pax Printer Repair	GIS Printer Repair & New Print Head	112123	2,560.05
San Diego County Water Auth.	Water Connection Fees Quarter Ending 9-30-17	112124	403,279.00
Schmidt Fire Protection Co Inc	Svc Fire Sprinkler System Bldg A	112125	530.00
Shamrock Group, Inc.	Paving Svc - 8 Inch Water Main Break	112126	6,920.00

VALLECITOS WATER DISTRICT
WARRANTS LIST
October 18, 2017

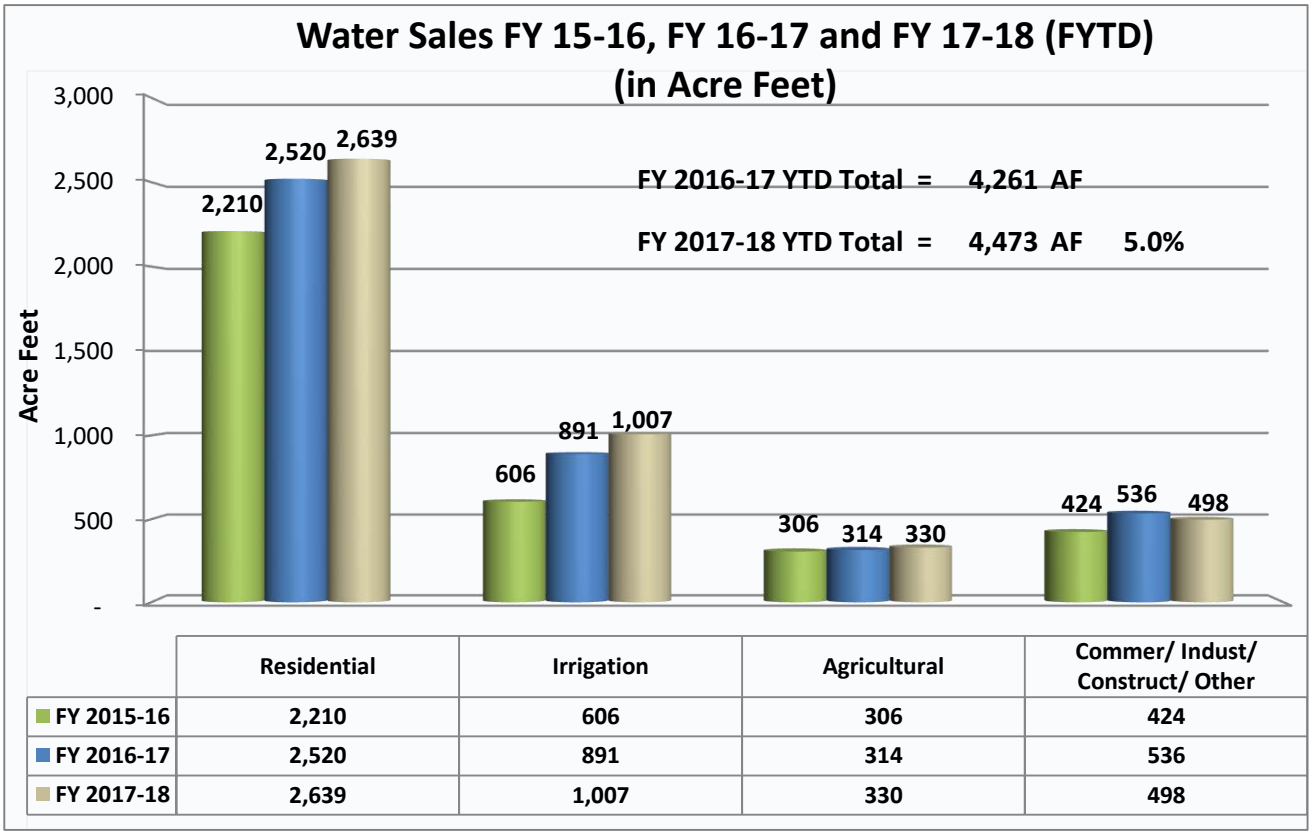
PAYEE	DESCRIPTION		CHECK#	AMOUNT
Sylvester Roofing Co Inc	Roof Replacement Progress Payment 20171-3		112127	244,000.00
Underground Service Alert	Storage Tank Maintenance Sept		112128	308.65
Unifirst Corporation	Uniform Delivery		112129	1,339.06
Vortex Industries Inc	Gate Repairs		112130	872.00
Waxie Sanitary Supply	Cleaning Supplies		112131	924.04
Total Disbursements (128 Checks)				1,255,381.46
WIRES				
Public Employees Retirement System	Retirement Contribution - October 10, 2017 Payroll		Wire	66,259.07
PAYROLL				
Total direct deposits			Wire	221,667.56
VWD Employee Association			112008	504.00
Garnishments		112009 through	112010	970.14
IRS	Federal payroll tax deposit		Wire	95,164.69
Employment Development Department	California payroll tax deposit		Wire	17,261.73
CalPERS	Deferred compensation withheld		Wire	13,126.10
VOYA	Deferred compensation withheld		Wire	3,849.11
Total October 10, 2017 Payroll Disbursements				352,543.33
TOTAL DISBURSEMENTS				1,674,183.86

Vallecitos Water District
Active Water Meters
September 30, 2017

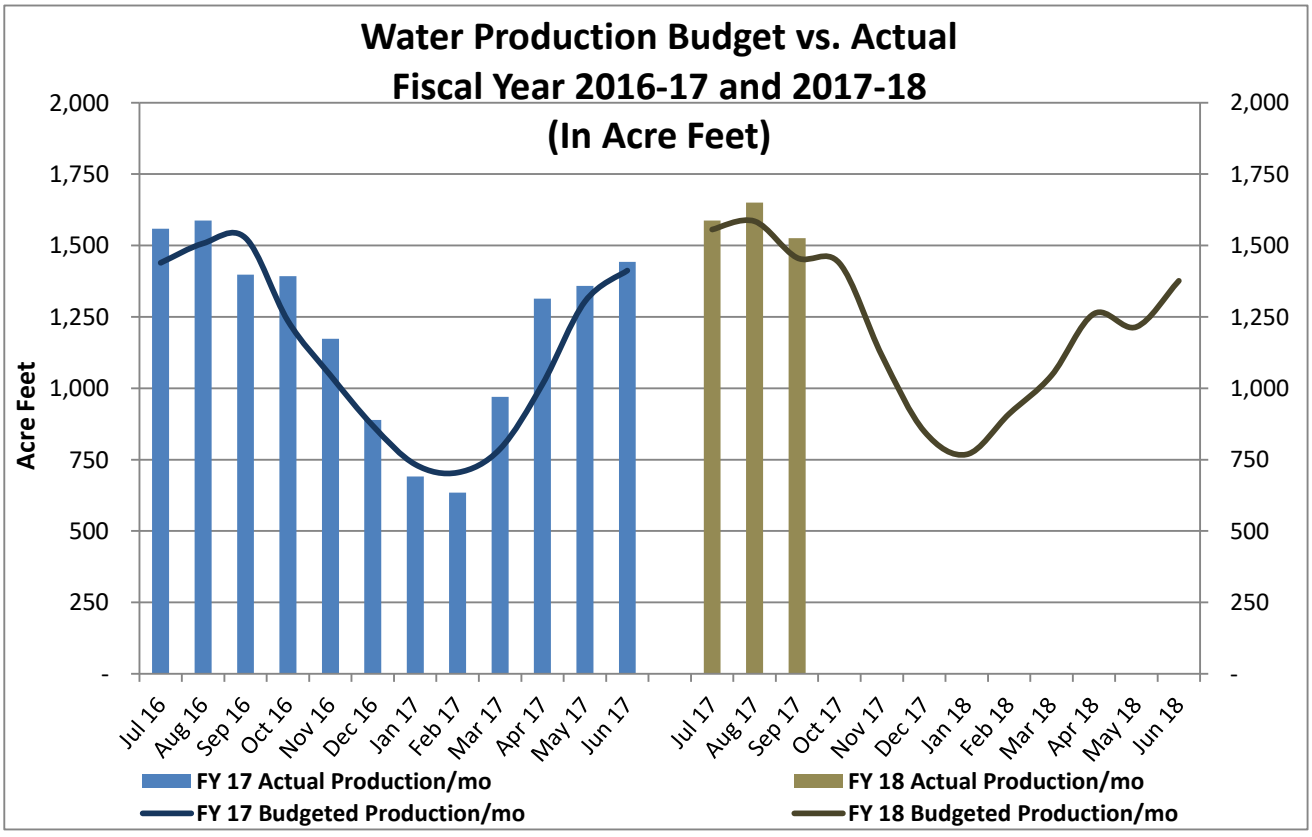




Vallecitos Water District
Water Production/Sales
September 30, 2017



	Residential	Irrigation	Agricultural	Commer/ Indust/ Construct/ Other
FY 2015-16	2,210	606	306	424
FY 2016-17	2,520	891	314	536
FY 2017-18	2,639	1,007	330	498



VALLECITOS WATER DISTRICT
Water and Wastewater Specialists since 1955

VALLECITOS WATER DISTRICT
QUARTERLY FINANCIAL REPORT
QUARTER ENDED SEPTEMBER 30, 2017

OVERVIEW

With the first quarter complete, the District's water fund has a net operating income of $1.1 million (before depreciation) while the sewer fund has a net operating income of $2.2 million (before depreciation). The District is cash funding capital projects and current on all debt service payments. We anticipated increased water revenues this year when putting the budget together and are monitoring expenses in all funds very closely.

WATER FUND

The Water Fund performed as expected during the first quarter of Fiscal Year 2018.

Revenues: Water sales were 34% of total budget as a result of high demand during the summer months. Ready to Serve (RTS) performed as expected. Pumping Charges are high corresponding with water sales.

Revenue	Budget	YTD Actual	Percent
Water Sales	$ 24,866,000	$ 8,384,864	34%
Ready to Serve	13,623,000	3,484,203	26%
Pumping Charges	250,000	88,146	35%
Other	680,000	181,765	27%
Total	**$ 39,419,000**	**$ 12,138,978**	**31%**

Expenses: Water Purchases are high in response to Water Sales. Operating and Supporting expenses were slightly lower than budgeted primarily due to lower staffing levels, and overall efficient operation of the system.

Expense	Budget	YTD Actual	Percent
Water Purchases	$ 28,531,000	$ 8,590,807	30%
Operating	4,488,000	880,096	20%
Supporting	3,932,000	834,302	21%
General & Admin	2,812,000	729,515	26%
Total	**$ 39,763,000**	**$ 11,034,720**	**28%**

SEWER FUND

The Sewer Fund continues to be stable as revenues received in this fund stem from fixed monthly charges and therefore very predictable.

Revenues: Sewer service charges performed as planned and Reclaimed Water Sales are adjusted at the end of each fiscal year to recover actual costs.

SEWER FUND (continued)

Revenue	Budget	YTD Actual	Percent
Sewer Service	$ 17,510,000	$ 4,506,306	26%
Reclaimed	2,055,000	513,750	25%
Other	78,000	16,720	21%
Total	**$ 19,643,000**	**$ 5,036,776**	**26%**

Expenses: Treatment expenses are low primarily due to timing of chemical purchases. Operating expenses are lower than expected due to budgeted repairs that have not been performed and lower than anticipated labor. Supporting and General & Administration are low primarily as a result of lower staffing levels.

Expense	Budget	YTD Actual	Percent
Treatment	$ 6,344,000	$ 1,537,982	24%
Operating	2,744,000	502,653	18%
Supporting	2,674,000	496,108	19%
General & Admin	1,455,000	286,500	20%
Total	**$ 13,217,000**	**$ 2,823,243**	**21%**

RESERVES AND FUNDS:

The following is a summary of the replacement reserves and capacity funds as of September 30, 2017.

Water:		
Revenues	**Replacement**	**Capacity**
FY 17/18 Operating Transfers	$ 1,104,258	-
Capital Facility Fees	-	$ 896,410
Property tax & Other	139,763	-
Total Revenue	1,244,021	896,410
Distributions		
Capital Projects	107,206	37,636
Net Increase/(Decrease)	1,136,815	858,774
Beginning Balance	29,885,306	(9,889,055)
Less: Operating Reserves	5,539,100	-
Ending Balance	$ 25,483,021	$ (9,030,281)
Replacement Reserve Floor	$ 6,721,600	
Replacement Reserve Ceiling	$ 28,785,100	

Wastewater:		
Revenues	**Replacement**	**Capacity**
FY 17/18 Operating Transfers	$ 2,213,533	-
Capital Facility Fees	-	$ 628,800
Property tax & Other	165,297	-
Total Revenue	2,378,830	628,800
Distributions		
Capital Projects	1,490,200	131,349
Debt Service	-	239,743
Total Distributions	1,490,200	371,092
Net Increase/(Decrease)	888,630	257,708
Beginning Balance	45,384,737	(6,501,911)
Less: Operating Reserves	6,518,000	-
Ending Balance	$ 39,755,367	$ (6,244,203)
Replacement Reserve Floor	$ 15,472,900	
Replacement Reserve Ceiling	$ 46,161,000	

DATE: **OCTOBER 18, 2017**
TO: **BOARD OF DIRECTORS**
SUBJECT: **MONTHLY FINANCIAL REPORTS**

BACKGROUND:

The Monthly Revenue and Expense Reports and the Reserve Report for the three months ended September 30, 2017 are presented.

DISCUSSION:

The Monthly Revenue and Expense reports summarize revenues by service type and expenses by department over the 3-month period. Comparisons to prior year actual and current year budget amounts are also presented. Any excess of revenues over expenses are transferred to reserves and reflected in the Reserve Report. Any excess of expenses above revenues are paid for out of reserves in the current fiscal year.

The Monthly Reserve Report presents the balances in each of the District's reserve funds. The report summarizes all sources and uses of reserves. Sources consist of operating transfers, capital facility fees, property taxes, dissolved RDA distributions, investment earnings and annexation fees. Uses are distributions for capital projects and debt service.

RECOMMENDATION:

For information only.

Vallecitos Water District
Water Revenue and Expense Report
For the Three Months Ended September 30, 2017

	Current Year Actual	Prior Year Actual	Variance		Current Year Budget	Variance	
		Amount	$	%	Amount	$	%
Revenue							
Water Sales	$ 8,384,864	$ 7,128,967	$ 1,255,897	17.6%	$ 7,990,000	$ 394,864	4.9%
Ready-to-serve	3,484,203	3,438,828	45,375	1.3%	3,405,000	79,203	2.3%
Pumping charges	88,146	54,204	33,942	62.6%	65,000	23,146	35.6%
Late & lock charges	109,661	110,118	(457)	-0.4%	115,000	(5,339)	-4.6%
Backflow fees	22,417	21,459	958	4.5%	24,000	(1,583)	-6.6%
Other revenue	49,687	51,212	(1,525)	-3.0%	31,300	18,387	58.7%
Total Revenue	12,138,978	10,804,788	1,334,190	12.3%	11,630,300	508,678	4.4%
Expenses							
Water costs	8,590,807	7,806,096	784,711	10.1%	8,199,000	391,807	4.8%
Pumping costs	158,472	156,154	2,318	1.5%	177,000	(18,528)	-10.5%
Water quality	27,144	19,610	7,534	38.4%	45,000	(17,856)	-39.7%
Water treatment	118,837	100,083	18,754	18.7%	108,000	10,837	10.0%
Tanks & reservoirs	57,860	50,951	6,909	13.6%	104,000	(46,140)	-44.4%
Trans & distribution	322,142	309,716	12,426	4.0%	460,000	(137,858)	-30.0%
Services	34,750	29,553	5,197	17.6%	62,000	(27,250)	-44.0%
Meters	151,886	156,140	(4,254)	-2.7%	156,000	(4,114)	-2.6%
Backflow prevention	9,005	17,177	(8,172)	-47.6%	16,000	(6,995)	-43.7%
Customer accounts	120,533	127,484	(6,951)	-5.5%	153,000	(32,467)	-21.2%
Building & grounds	93,297	91,489	1,808	2.0%	89,000	4,297	4.8%
Equipment & vehicles	55,513	46,773	8,740	18.7%	77,000	(21,487)	-27.9%
Engineering	331,405	325,484	5,921	1.8%	346,000	(14,595)	-4.2%
Safety & compliance	56,875	53,481	3,394	6.3%	65,000	(8,125)	-12.5%
Information Systems	176,679	153,740	22,939	14.9%	250,000	(73,321)	-29.3%
General & administrative	729,515	616,783	112,732	18.3%	704,000	25,515	3.6%
Total Expenses	11,034,720	10,060,714	974,006	9.7%	11,011,000	23,720	0.2%
Net Operating Income	$ 1,104,258	$ 744,074	360,184	48.4%	$ 619,300	484,958	78.3%

Vallecitos Water District
Sewer Revenue and Expense Report
For the Three Months Ended September 30, 2017

	Current Year Actual	Prior Year Actual	Variance		Current Year Budget	Variance	
		Amount	$	%	Amount	$	%
Revenue							
Sewer service charges	$ 4,506,306	$ 4,355,735	$ 150,571	3.5%	$ 4,367,000	$ 139,306	3.2%
Reclaimed water sales	513,750	484,500	29,250	6.0%	514,000	(250)	0.0%
Other revenue	16,720	16,671	49	0.3%	12,000	4,720	39.3%
Total Revenue	5,036,776	4,856,906	179,870	3.7%	4,893,000	143,776	2.9%
Expenses							
Collection & conveyance	421,903	428,242	(6,339)	-1.5%	564,000	(142,097)	-25.2%
Lift stations	44,952	57,508	(12,556)	-21.8%	78,000	(33,048)	-42.4%
Source Control	35,798	34,250	1,548	4.5%	44,000	(8,202)	-18.6%
Effluent disposal	896,272	672,750	223,522	33.2%	718,000	178,272	24.8%
Meadowlark	641,710	693,237	(51,527)	-7.4%	868,000	(226,290)	-26.1%
Customer Accounts	83,314	89,256	(5,942)	-6.7%	114,000	(30,686)	-26.9%
Building & grounds	60,133	55,979	4,154	7.4%	64,000	(3,867)	-6.0%
Equipment & vehicles	40,765	35,955	4,810	13.4%	57,000	(16,235)	-28.5%
Engineeering	129,507	135,641	(6,134)	-4.5%	177,000	(47,493)	-26.8%
Safety & compliance	34,984	36,110	(1,126)	-3.1%	47,000	(12,016)	-25.6%
Information Systems	147,405	127,336	20,069	15.8%	208,000	(60,595)	-29.1%
General & administrative	286,500	239,859	46,641	19.4%	363,000	(76,500)	-21.1%
Total Expenses	2,823,243	2,606,123	217,120	8.3%	3,302,000	(478,757)	-14.5%
Net Operating Income	$ 2,213,533	$ 2,250,783	(37,250)	-1.7%	$ 1,591,000	622,533	39.1%

VALLECITOS WATER DISTRICT

RESERVE ACTIVITY FOR THE THREE MONTHS ENDED SEPTEMBER 30, 2017

	110 Water 120		210 Wastewater 220		
	Replacement	Capacity	Replacement	Capacity	Total
BEGINNING BALANCE	$ 29,885,306	$ (9,889,055)	$ 45,384,737	$ (6,501,911)	$ 58,878,989
REVENUES					
FY 17/18 Operating Transfers	1,104,258		2,213,533		3,317,791
Capital Facility Fees	-	896,410	-	628,800	1,525,210
Investment Earnings	80,933	-	117,428	-	198,362
Property Tax	58,830	-	47,869	-	106,699
TOTAL REVENUES	1,244,021	896,410	2,378,830	628,800	5,148,062
LESS DISTRIBUTIONS					
Capital Projects					
Encina Wastewater Auth 5 Year Cap Plan	-	-	1,101,781	-	1,101,781
Lift Station 1 Wet Well Room Repairs	-	-	122,524	-	122,524
San Marcos interceptor sewer	-	-	32,839	73,093	105,932
Montiel Gravity Outfall	-	-	19,842	24,252	44,094
Palos Vista Pump Station Motor Replacement	30,599	-	-	-	30,599
Nursery Valve Relocation	-	-	26,398	-	26,398
Mrf Refurbish Backwash Pumps And Motors	-	-	23,908	-	23,908
Tertiary Filter Media	-	-	21,151	-	21,151
Moymo Solids Pump Rotor Replacment Mrf	-	-	19,136	-	19,136
North Vista Pressure Reducing Station Upgrade	17,169	-	-	-	17,169
Water & Sewer Master Plan	-	8,167	-	8,167	16,334
Fulton Road And Nctd Sewer Line Rehabilitation	-	-	14,777	-	14,777
Mrf - Failsafe Line De-Chlorination System	-	-	14,285	-	14,285
South Vista Pressure Reducing Station Upgrade	13,405	-	-	-	13,405
District Wide Valve Replacement	12,134	-	-	-	12,134
Rock Springs Sewer Replacement	-	-	4,924	6,018	10,942
All other capital projects	15,560	4,896	17,935	3,265	41,656
Capital Budget - Vehicles/Mobile Equipmnt	18,339	-	70,700	-	89,039
Debt Service	-	-	-	239,743	239,743
Interest Expense	-	24,573	-	16,555	41,128
TOTAL DISTRIBUTIONS	107,206	37,636	1,490,200	371,092	2,006,135
ENDING BALANCE	$ 31,022,121	$ (9,030,281)	$ 46,273,367	$ (6,244,203)	$ 62,020,916
Less: Operating Reserves	5,539,100	-	6,518,000	-	12,057,100
Replacement Reserves/Restricted Funds	$ 25,483,021	$ (9,030,281)	$ 39,755,367	$ (6,244,203)	$ 49,963,816
Replacement reserve floor	$ 6,721,600		$ 15,472,900		
Replacement reserve ceiling	$ 28,785,100		$ 46,161,000		

VALLECITOS WATER DISTRICT
INVESTMENT REPORT FOR SEPTEMBER 2017

Attached is a detailed list of investments for all District funds that are not needed to meet current obligations. In accordance with Government Code Section 53646, the information is presented to the Board on a monthly basis and includes a breakdown by fund, financial institution, settlement and maturity date, yield, and investment amount. In addition, the report indicates the various percentages of investments in each type of institution.

When investments are being made, two or three institutions are contacted to obtain prevailing rates. Consideration is given to Safety, Liquidity, and Yield, in that order. Necessary approvals and reviews are obtained. This process and the presentation of the information to the Board are in compliance with requirements outlined in the District Investment Policy adopted on an annual basis. In addition to the investment portfolio, there are sufficient funds in the Operating Account to meet District obligations for the next 30 days. Maturity dates on investments are structured to meet the future financial obligations of the District (i.e., bond payments and construction projections). In that regard, the District will be able to meet expenditure requirements for the next six months without a need to liquidate an investment earlier than scheduled maturity dates.

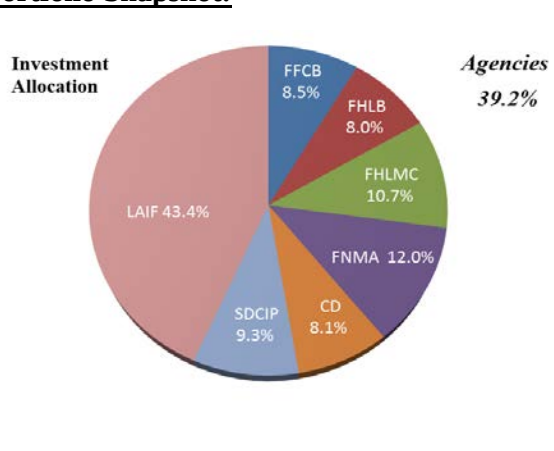
Investment activity for the month of September follows:

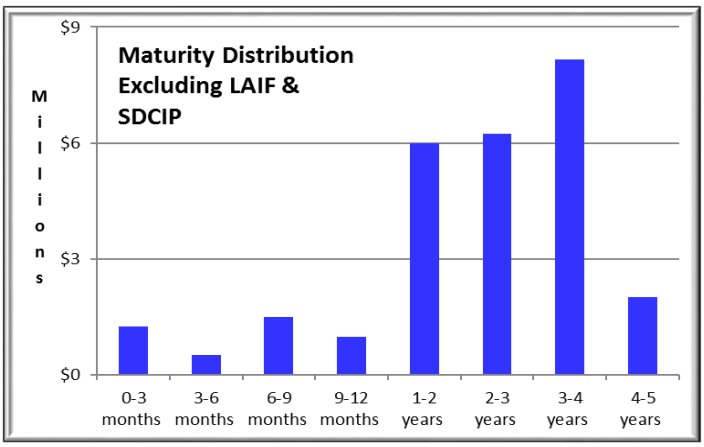
Date	Activity	Investment	Amount	Maturity	Yield
09/06/17	Deposit	LAIF	850,000	Open	1.11%
09/08/17	Deposit	LAIF	500,000	Open	1.11%
09/12/17	Deposit	LAIF	350,000	Open	1.11%
09/15/17	Deposit	LAIF	1,400,000	Open	1.11%
09/15/17	Full Call	FHLMC step	(750,000)	06/15/20	1.50%
09/18/17	Withdrawal	LAIF	(2,700,000)	Open	1.11%
09/20/17	Maturity	Mbank CD	(245,000)	09/20/17	1.50%
09/21/17	Deposit	LAIF	900,000	Open	1.11%
09/22/17	Deposit	LAIF	650,000	Open	1.11%
Change in investments during the month			$ 955,000		

	Current
Weighted average annual yield for total Vallecitos investments	1.306%
Weighted average days to maturity	419

The State Treasurer's Office provides fair market values of LAIF quarterly on their web site. The most recent valuation, which is used on this report, is as of June 30, 2017, The San Diego County Treasurer provides the fair values for the County investment pool. The most recent values and returns, which are used for this report, are for August 31, 2017. Fair values for federal agency obligations and corporate notes are provided by Union Bank trust account reporting.

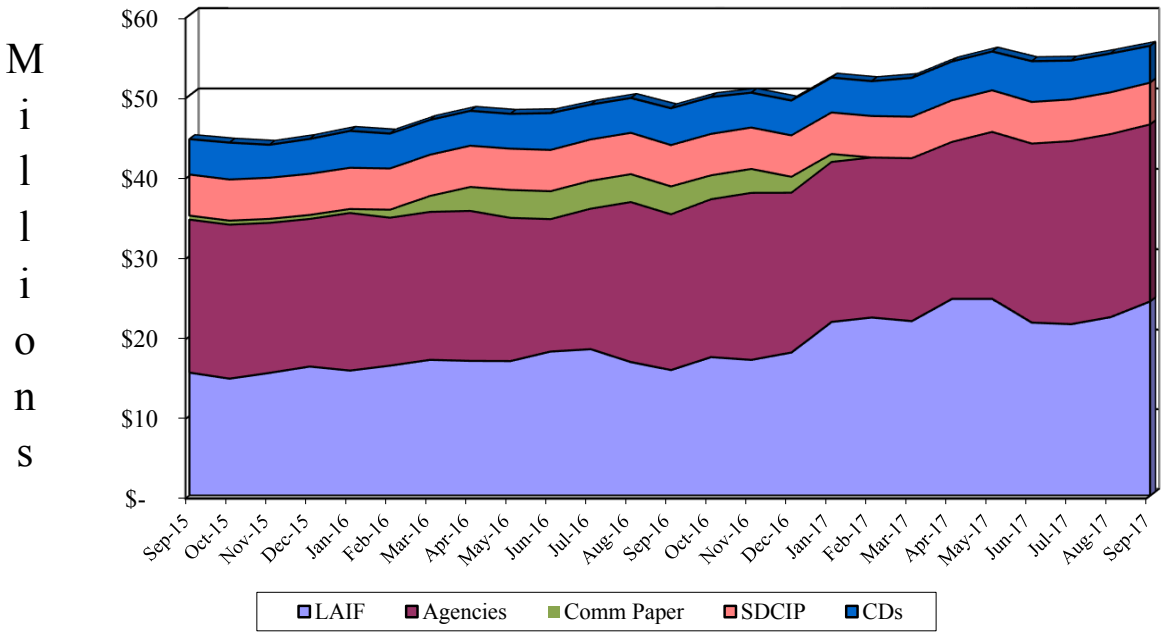
Portfolio Snapshot:





Safety

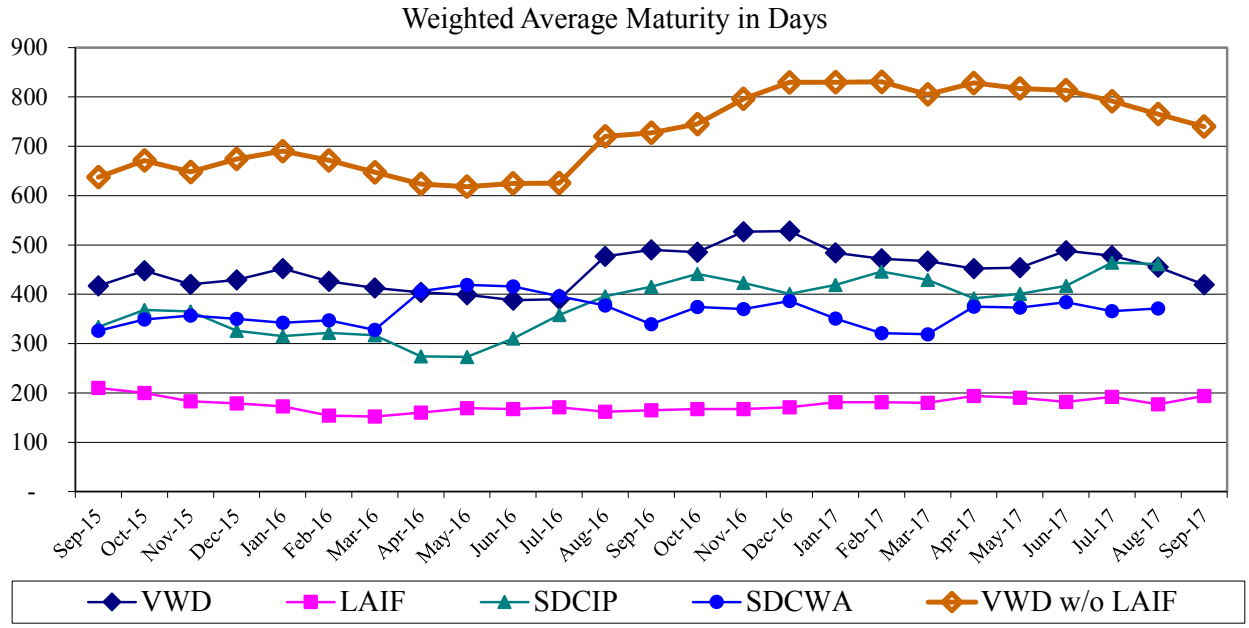
Criteria for selecting investments and the absolute order of priority are safety, liquidity and yield. To meet the objective of safety and avert credit risk, the District acquires only those investments permitted by adopted Board policy and with in limits established in the policy. Credit risk is the risk that an issuer or other counter party to an investment will not fulfill its obligation. The District also limits risk by investing in a range of instruments to insure diversification as indicated in the graph below.



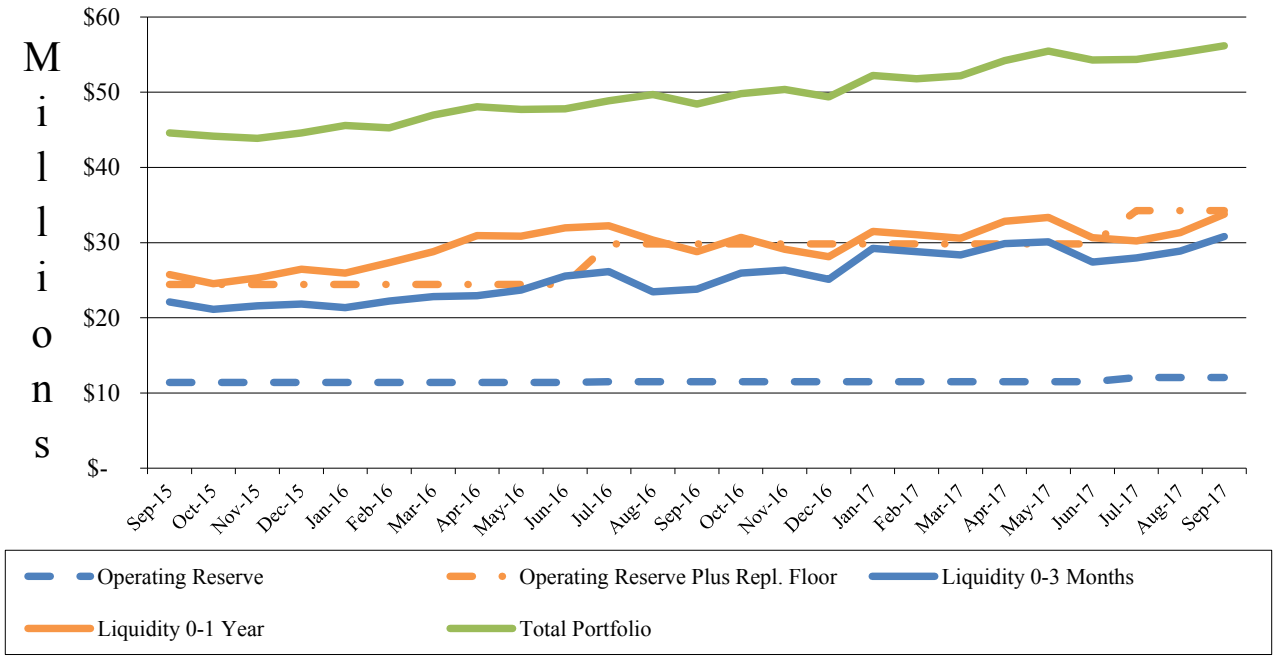
The graph above represents investment levels in the State of California's Local Agency Investment Fund (LAIF), federal agency obligations, commercial paper, FDIC backed corporate notes, the San Diego County Investment Pool (SDCIP), and certificates of deposit.

Liquidity

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of investments. The District averts interest rate risk by limiting terms of investments in accordance with the Investment Policy. Maturity in days is a measure of liquidity. The next graph compares the District's liquidity to other managed portfolios. The District's liquidity is graphed with and without LAIF. With LAIF the District is in fact very liquid with $24.4 million available the same day. But for comparative purposes LAIF is eliminated from the District's portfolio and shown separately.

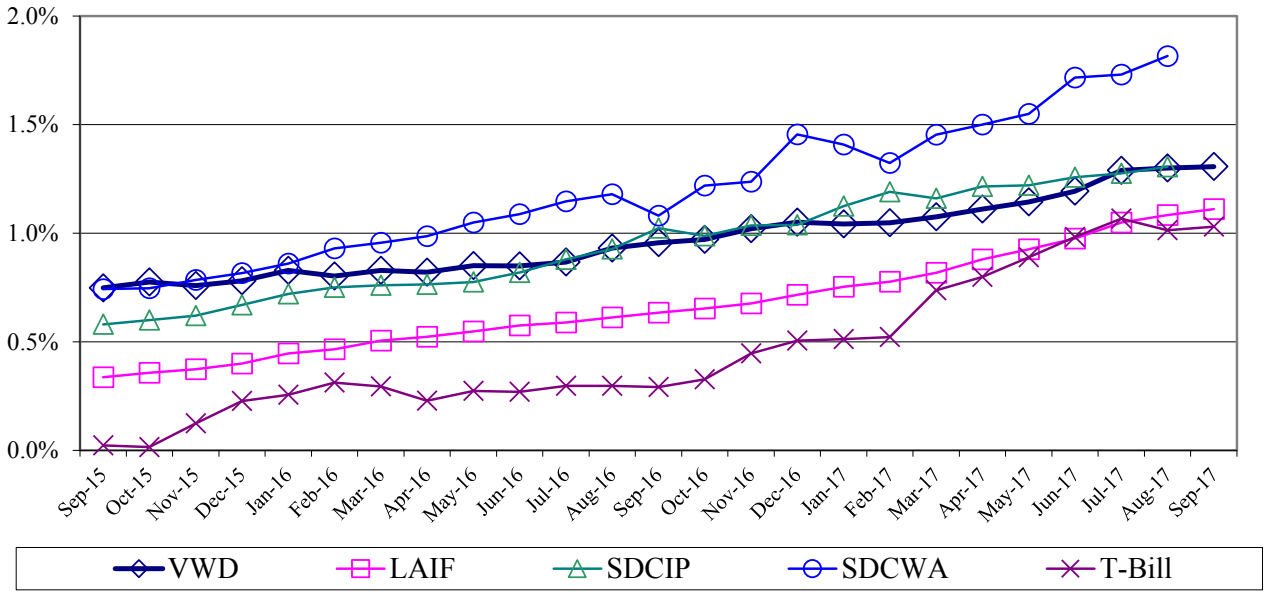


The graph below trends the ***relationship of liquidity to adopted reserve levels***. District staff is sensitive to this relationship, but also recognizes the risk of being too liquid if rates fall further.



Yield

The next graph compares the District's effective yield to LAIF, SDCIP, San Diego County Water Authority (SDCWA), and the average 91-day Treasury bill rate.



Investment/Debt Management

On July 9, 2015, the District refunded most of its 2007 Certificates of Participation with Revenue Bonds containing interest rates ranging between 4% and 5%. The District is obligated to transfer semi-annual debt service payments each June 25th (maximum of $3.9 million in year 2030) and each December 26th (maximum of $980,000 in year 2021) to the trustee for payment to bondholders for the 2015 Revenue Bonds. Staff targets these dates for maturities and proposes user rates that, given all other budget assumptions, satisfy debt service coverage requirements. On November 12, 2008, the District secured a private placement, variable rate loan (currently at 1.70895%) from Union Bank for $8 million to fund remaining and prior construction costs of the Encina Wastewater Authority Phase V expansion. The District is debt financing certain sewer projects with a $7.1 million 10-year loan received from Bank of America in December of 2012, at a 1.98% fixed rate.

Investment Strategy

Staff is sensitive to the need to maintain minimum liquidity and invests to insure that a portion of the portfolio equal to the operating reserves matures within three months, and a portion of the portfolio equal to the operating reserves plus the replacement reserve floors matures within one year. Staff also recognizes that too much liquidity presents interest rate risk and, therefore, maintains investment maturities close to the liquidity targets. When total investment maturities are projected to remain above liquidity targets, investment are made further out on the curve to ladder maturities, maintain diversity among investment types and issuers, and maximize yield.

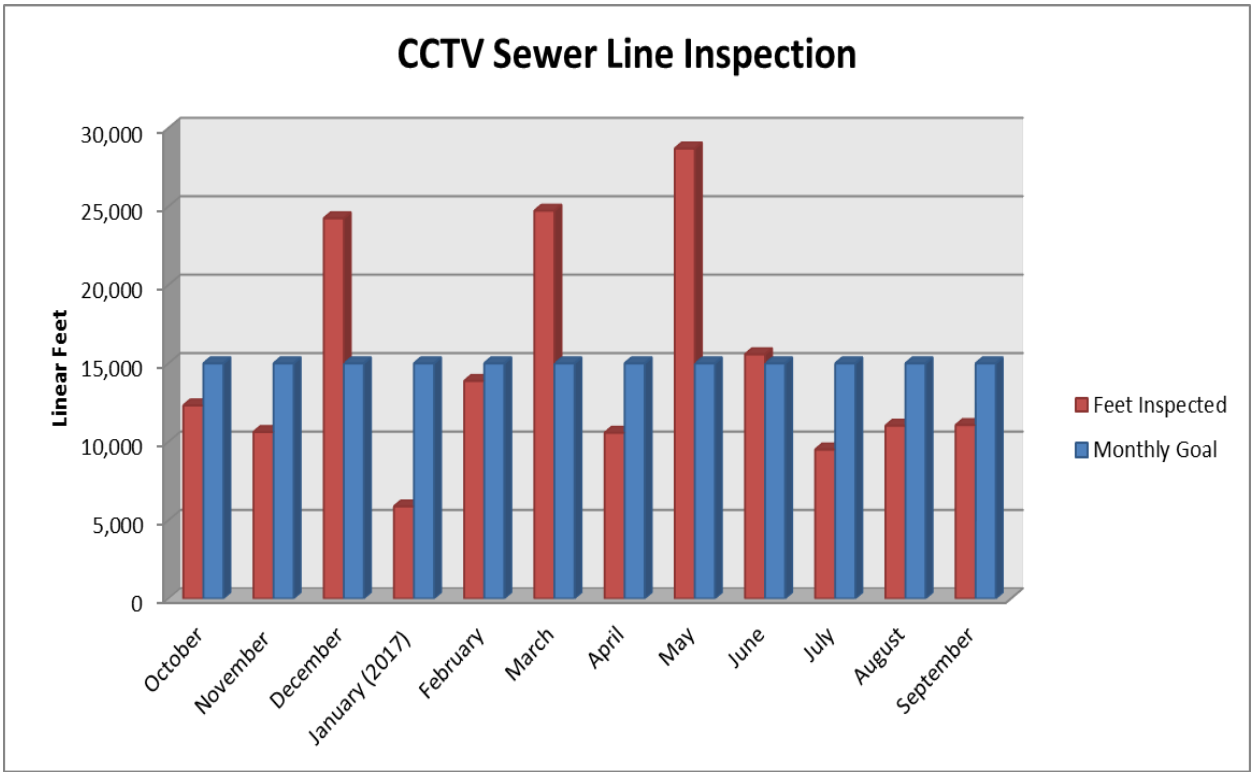
The District continues to diversify various aspects of the portfolio and avoid speculating since the portfolio is passively managed (no staff dedicated solely to investing and monitoring credits). Staff diversifies the portfolio by investment type, maturity and settlement dates (time averaging), and call provisions. The District continues to maintain investments of varying types within limits allowed by investment policy (60% in federal agency obligations, 60% in LAIF, 40% in other local government investment pools, 20% in FDIC-backed corporate notes, 20% in commercial paper, 20% in certificates of deposit).

By Fund							Replacement		Capacity		
Reference	S&P	Coupon	Yield	Settled	Callable	Matures	Water 110	Sewer 210	Water 120	Sewer 220	Total
FNMA	AA+	0.875	0.917	02/24/15	na	10/26/17	-	499,465	-	-	499,465
FNMA	AA+	0.875	0.917	12/02/15	na	10/26/17	-	499,625	-	-	499,625
Compass CD		1.300	1.300	12/09/15	na	12/11/17	-	245,000	-	-	245,000
FFCB	AA+	0.840	0.840	10/22/15	10/31/17	01/22/18	-	500,000	-	-	500,000
FFCB	AA+	0.930	0.930	10/21/15	10/13/17	04/13/18	499,705	-	-	-	499,705
Am Exp CD		1.100	1.100	04/29/15	na	04/30/18	245,000	-	-	-	245,000
FNMA	AA+	0.875	1.090	11/12/15	na	05/21/18	-	497,325	-	-	497,325
Synchrony CD		1.600	1.600	06/13/14	na	06/13/18	245,000	-	-	-	245,000
Goldman CD		1.700	1.700	08/19/15	na	08/20/18	-	245,000	-	-	245,000
GE Cap CD		1.800	1.800	09/05/14	na	09/05/18	-	245,000	-	-	245,000
FHLB	AA+	1.200	1.260	06/29/15	na	09/26/18	499,050	-	-	-	499,050
Capital 1 CD		1.650	1.650	10/13/15	na	10/09/18	179,000	-	-	-	179,000
Ally Bank CD		1.600	1.600	10/29/15	na	10/29/18	245,000	-	-	-	245,000
Sallie Mae CD		1.600	1.600	12/09/15	na	12/10/18	-	245,000	-	-	245,000
FHLB	AA+	1.240	1.240	02/08/17	01/23/18	01/23/19	-	500,000	-	-	500,000
FNMA	AA+	1.000	1.000	07/25/16	10/25/17	01/25/19	499,900	-	-	-	499,900
FFCB	AA+	1.150	1.396	03/07/17	10/31/17	02/22/19	-	365,260	-	-	365,260
BMW Bk CD		1.350	1.350	03/10/17	na	03/11/19	-	245,000	-	-	245,000
Whitney Bank CD		1.650	1.650	04/20/17	na	04/22/19	-	245,000	-	-	245,000
Enerbank CD		1.500	1.579	06/18/15	na	05/15/19	232,301	-	-	-	232,301
FFCB	AA+	1.180	1.180	05/26/17	10/31/17	06/13/19	497,500	-	-	-	497,500
FHLB(s)	AA+	1.125	1.125	07/07/17	12/28/17	06/28/19	-	500,000	-	-	500,000
FHLMC(s)	AA+	1.250	1.250	06/28/16	12/28/17	06/28/19	-	750,000	-	-	750,000
FFCB	AA+	1.080	1.080	07/12/16	10/31/17	07/12/19	499,675	-	-	-	499,675
FHLMC(s)	AA+	1.125	1.125	08/30/16	11/28/17	08/28/19	750,000	-	-	-	750,000
Barclays CD		1.900	1.900	09/16/15	na	09/16/19	-	245,000	-	-	245,000
FHLMC	AA+	1.250	1.317	09/25/15	na	10/02/19	498,665	-	-	-	498,665
FHLB	AA+	1.190	1.190	10/28/16	10/28/17	10/28/19	500,000	-	-	-	500,000
FHLMC(s)	AA+	1.250	1.250	08/22/16	11/22/17	11/22/19	-	750,000	-	-	750,000
FNMA	AA+	1.350	1.350	06/30/16	12/30/17	12/30/19	-	500,000	-	-	500,000
Key Bank CD		1.700	1.700	03/08/17	na	03/09/20	-	245,000	-	-	245,000
FNMA	AA+	1.300	1.300	10/19/16	12/30/17	03/30/20	500,000	-	-	-	500,000
FHLB	AAA	1.670	1.670	04/28/17	10/31/17	04/28/20	-	750,000	-	-	750,000
FNMA	AA+	1.500	1.500	05/27/16	11/29/17	05/29/20	750,000	-	-	-	750,000
HSBC Bank CD		1.400	1.400	09/16/16	07/08/18	07/08/20	-	244,510	-	-	244,510
FHLB	AA+	1.200	1.200	11/22/16	10/31/17	07/13/20	492,970	-	-	-	492,970
FNMA	AA+	1.400	1.400	08/24/16	11/24/17	08/24/20	-	1,000,000	-	-	1,000,000
Discover CD		1.500	1.500	10/26/16	na	10/26/20	245,000	-	-	-	245,000
FFCB	AA+	1.380	1.380	11/04/16	na	11/02/20	-	499,600	-	-	499,600
FFCB	AA+	1.770	1.770	12/07/16	12/07/17	12/07/20	-	249,438	-	-	249,438
FHLMC(s)	AA+	1.400	1.400	06/27/17	12/22/17	12/22/20	-	750,000	-	-	750,000
Northern Bk & Trust		1.850	1.850	06/29/17	06/29/18	12/29/20	245,000	-	-	-	245,000
FNMA	AA+	1.400	1.400	10/28/16	10/28/17	01/28/21	500,000	-	-	-	500,000
FFCB	AA+	1.620	1.620	11/18/16	10/31/17	02/17/21	-	149,667	-	-	149,667
FHLMC(s)	AA+	1.250	1.250	02/26/16	11/26/17	02/26/21	-	514,000	-	-	514,000
Wells Fargo CD(s)		1.150	1.150	03/04/16	09/04/18	03/04/21	-	243,000	-	-	243,000
FHLB(s)	AA+	1.500	1.500	04/06/17	12/22/17	03/22/21	-	274,381	-	-	274,381
FFCB	AA+	1.620	1.620	04/12/16	10/31/17	04/12/21	749,925	-	-	-	749,925
FFCB	AA+	1.990	1.990	05/03/17	10/31/17	05/03/21	-	750,000	-	-	750,000
Comenty Bk CD		1.650	1.650	06/30/16	na	06/30/21	-	245,000	-	-	245,000
FNMA	AA+	1.500	1.500	07/27/16	10/27/17	07/27/21	-	500,000	-	-	500,000
JPM Chase CD		1.650	1.650	08/16/16	11/16/17	08/16/21	-	245,000	-	-	245,000
FHLMC	AA+	1.600	1.600	08/25/16	11/25/17	08/25/21	1,000,000	-	-	-	1,000,000
FHLB	AA+	1.625	1.625	09/30/16	12/30/17	09/30/21	-	1,000,000	-	-	1,000,000
FNMA	AA+	1.550	1.550	10/31/16	10/28/17	10/28/21	1,000,000	-	-	-	1,000,000
FHLMC	AA+	1.875	1.875	11/30/16	11/26/17	11/26/21	-	1,000,000	-	-	1,000,000
SDCIP	AAA	na	1.717	Various	na	Open	-	5,196,328	-	-	5,196,328
LAIF		na	1.111	Various	na	Open	12,181,571	12,186,154	-	-	24,367,725
Total Cost							23,055,262	33,118,753	-	-	56,174,015
Unrealized Gain/(Loss)							(106,925)	(123,051)	-	-	(229,976)
Market Value							$ 22,948,337	$ 32,995,702	$ -	$ -	$ 55,944,039

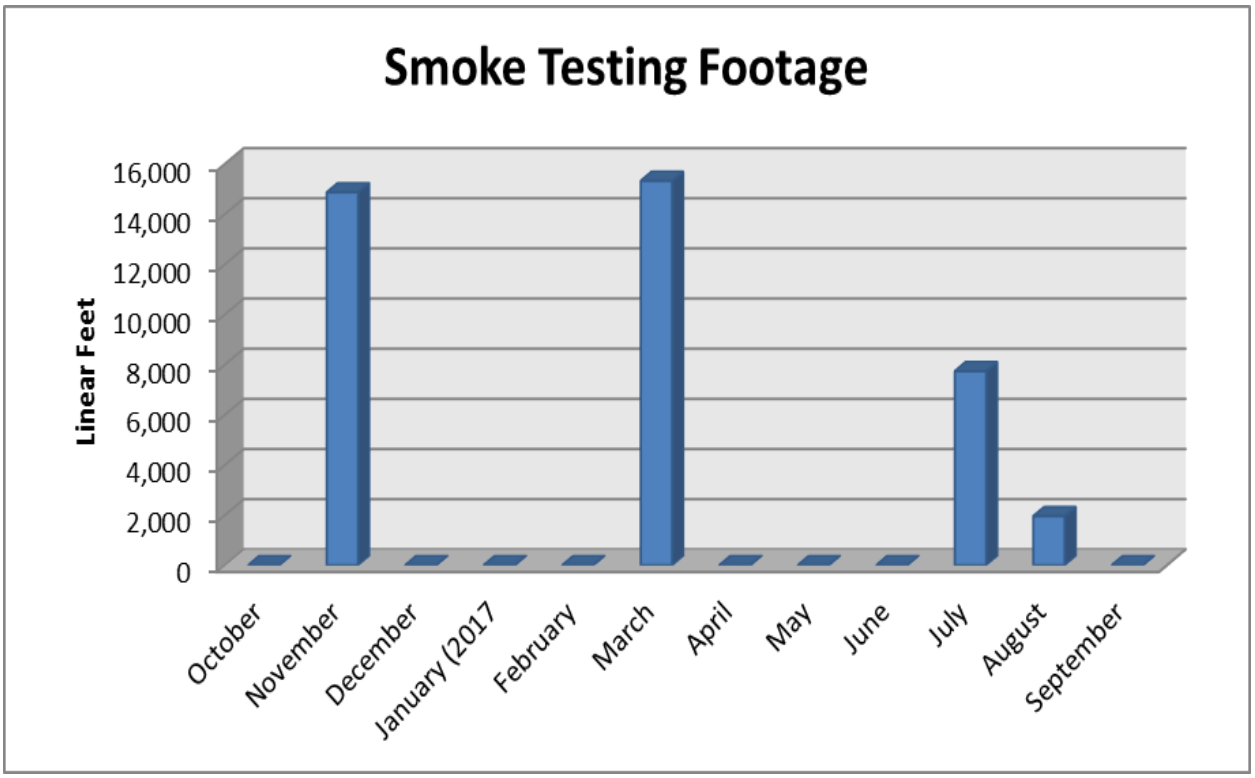
By Investment Type

Reference	Settled	Coupon	Yield	Matures	CDs	Agencies	LGIPs	LAIF	Total Cost	Total Market
FNMA	02/24/15	0.875	0.917	10/26/17	-	499,465	-	-	499,465	499,945
FNMA	12/02/15	0.875	0.917	10/26/17	-	499,625	-	-	499,625	499,945
Compass CD	12/09/15	1.300	1.300	12/11/17	245,000	-	-	-	245,000	245,115
FFCB	10/22/15	0.840	0.840	01/22/18	-	500,000	-	-	500,000	499,495
FFCB	10/21/15	0.930	0.930	04/13/18	-	499,705	-	-	499,705	498,925
Am Exp CD	04/29/15	1.100	1.100	04/30/18	245,000	-	-	-	245,000	245,007
FNMA	11/12/15	0.875	1.090	05/21/18	-	497,325	-	-	497,325	498,720
Synchrony CD	06/13/14	1.600	1.600	06/13/18	245,000	-	-	-	245,000	245,341
Goldman CD	08/19/15	1.700	1.700	08/20/18	245,000	-	-	-	245,000	245,556
GE Cap CD	09/05/14	1.800	1.800	09/05/18	245,000	-	-	-	245,000	245,747
FHLB	06/29/15	1.200	1.260	09/26/18	-	499,050	-	-	499,050	499,265
Capital 1 CD	10/13/15	1.650	1.650	10/09/18	179,000	-	-	-	179,000	179,320
Ally Bank CD	10/29/15	1.600	1.600	10/29/18	245,000	-	-	-	245,000	245,434
Sallie Mae CD	12/09/15	1.600	1.600	12/10/18	245,000	-	-	-	245,000	245,270
FHLB	02/08/17	1.240	1.240	01/23/19	-	500,000	-	-	500,000	498,200
FNMA	07/25/16	1.000	1.000	01/25/19	-	499,900	-	-	499,900	495,800
FFCB	03/07/17	1.150	1.396	02/22/19	-	365,260	-	-	365,260	364,233
BMW Bk CD	03/10/17	1.350	1.350	03/11/19	245,000	-	-	-	245,000	244,143
Whitney Bank CD	04/20/17	1.650	1.650	04/22/19	245,000	-	-	-	245,000	245,127
Enerbank CD	06/18/15	1.500	1.579	05/15/19	232,301	-	-	-	232,301	232,520
FFCB	05/26/17	1.180	1.180	06/13/19	-	497,500	-	-	497,500	495,555
FHLB(s)	07/07/17	1.125	1.125	06/28/19	-	500,000	-	-	500,000	499,655
FHLMC(s)	06/28/16	1.250	1.250	06/28/19	-	750,000	-	-	750,000	747,773
FFCB	07/12/16	1.080	1.080	07/12/19	-	499,675	-	-	499,675	494,650
FHLMC(s)	08/30/16	1.125	1.125	08/28/19	-	750,000	-	-	750,000	747,728
Barclays CD	09/16/15	1.900	1.900	09/16/19	245,000	-	-	-	245,000	246,593
FHLMC	09/25/15	1.250	1.317	10/02/19	-	498,665	-	-	498,665	497,135
FHLB	10/28/16	1.190	1.190	10/28/19	-	500,000	-	-	500,000	494,815
FHLMC(s)	08/22/16	1.250	1.250	11/22/19	-	750,000	-	-	750,000	746,828
FNMA	06/30/16	1.350	1.350	12/30/19	-	500,000	-	-	500,000	494,675
Key Bank CD	03/08/17	1.700	1.700	03/09/20	245,000	-	-	-	245,000	244,463
FNMA	10/19/16	1.300	1.300	03/30/20	-	500,000	-	-	500,000	494,165
FHLB	04/28/17	1.670	1.670	04/28/20	-	750,000	-	-	750,000	746,963
FNMA	05/27/16	1.500	1.500	05/29/20	-	750,000	-	-	750,000	744,900
HSBC Bank CD	09/16/16	1.400	1.400	07/08/20	244,510	-	-	-	244,510	241,764
FHLB	11/22/16	1.200	1.200	07/13/20	-	492,970	-	-	492,970	492,160
FNMA	08/24/16	1.400	1.400	08/24/20	-	1,000,000	-	-	1,000,000	989,060
Discover CD	10/26/16	1.500	1.500	10/26/20	245,000	-	-	-	245,000	240,269
FFCB	11/04/16	1.380	1.380	11/02/20	-	499,600	-	-	499,600	488,805
FFCB	12/07/16	1.770	1.770	12/07/20	-	249,438	-	-	249,438	248,408
FHLMC(s)	06/27/17	1.400	1.400	12/22/20	-	750,000	-	-	750,000	749,468
Northern Bk & Trust	06/29/17	1.850	1.850	12/29/20	245,000	-	-	-	245,000	244,427
FNMA	10/28/16	1.400	1.400	01/28/21	-	500,000	-	-	500,000	490,570
FFCB	11/18/16	1.620	1.620	02/17/21	-	149,667	-	-	149,667	147,999
FHLMC(s)	02/26/16	1.250	1.250	02/26/21	-	514,000	-	-	514,000	510,752
Wells Fargo CD(s)	03/04/16	1.150	1.150	03/04/21	243,000	-	-	-	243,000	242,973
FHLB(s)	04/06/17	1.500	1.500	03/22/21	-	274,381	-	-	274,381	274,076
FFCB	04/12/16	1.620	1.620	04/12/21	-	749,925	-	-	749,925	742,035
FFCB	05/03/17	1.990	1.990	05/03/21	-	750,000	-	-	750,000	748,133
Comenty Bk CD	06/30/16	1.650	1.650	06/30/21	245,000	-	-	-	245,000	241,817
FNMA	07/27/16	1.500	1.500	07/27/21	-	500,000	-	-	500,000	490,570
JPM Chase CD	08/16/16	1.650	1.650	08/16/21	245,000	-	-	-	245,000	240,379
FHLMC	08/25/16	1.600	1.600	08/25/21	-	1,000,000	-	-	1,000,000	986,040
FHLB	09/30/16	1.625	1.625	09/30/21	-	1,000,000	-	-	1,000,000	982,640
FNMA	10/31/16	1.550	1.550	10/28/21	-	1,000,000	-	-	1,000,000	973,610
FHLMC	11/30/16	1.875	1.875	11/26/21	-	1,000,000	-	-	1,000,000	990,170
SDCIP	Various		1.717	Open	-	-	5,196,328	-	5,196,328	5,177,000
LAIF	Various		1.111	Open	-	-	-	24,367,725	24,367,725	24,341,908
Total Cost					4,573,811	22,036,151	5,196,328	24,367,725	56,174,015	
Unrealized Gain/(Loss)					(12,546)	(172,289)	(19,328)	(25,813)	(229,976)	
Market Value					$ 4,561,265	$ 21,863,862	$ 5,177,000	$ 24,341,912	$ 55,944,039	$ 55,944,039
Percentage of Portfolio					8.1%	39.2%	9.3%	43.4%		
Investment Policy Limits					20.0%	60.0%	40.0%	60.0%		

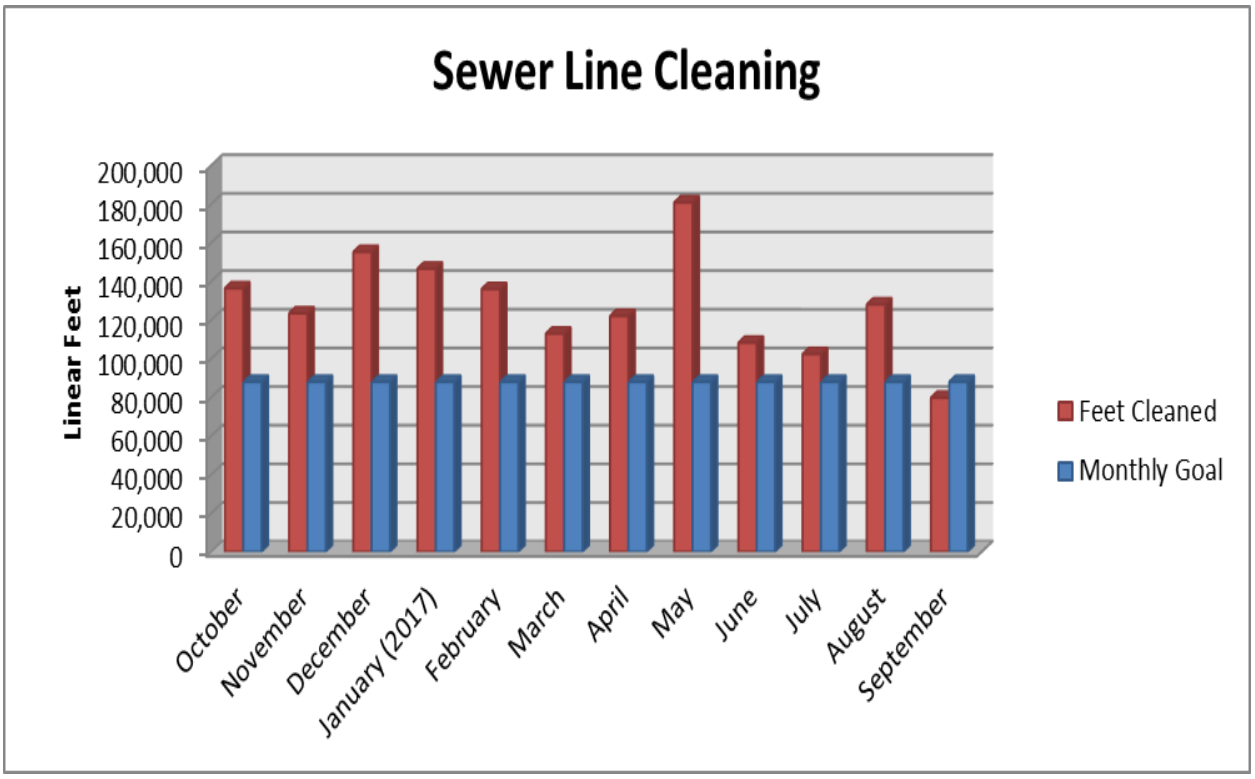
Quarterly O&M Metrics Report



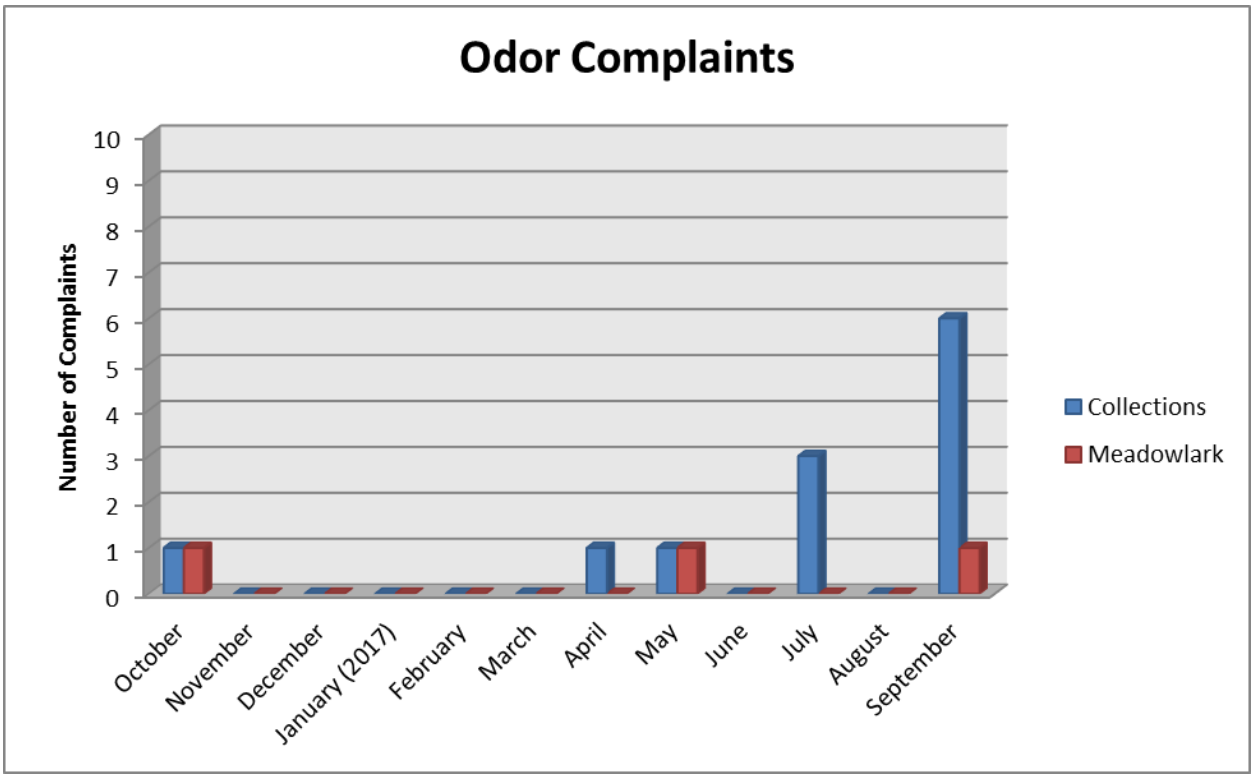
CCTV Sewer Line Inspection Totals in Feet
(Goal is to inspect 180,000 feet of gravity lines per year)



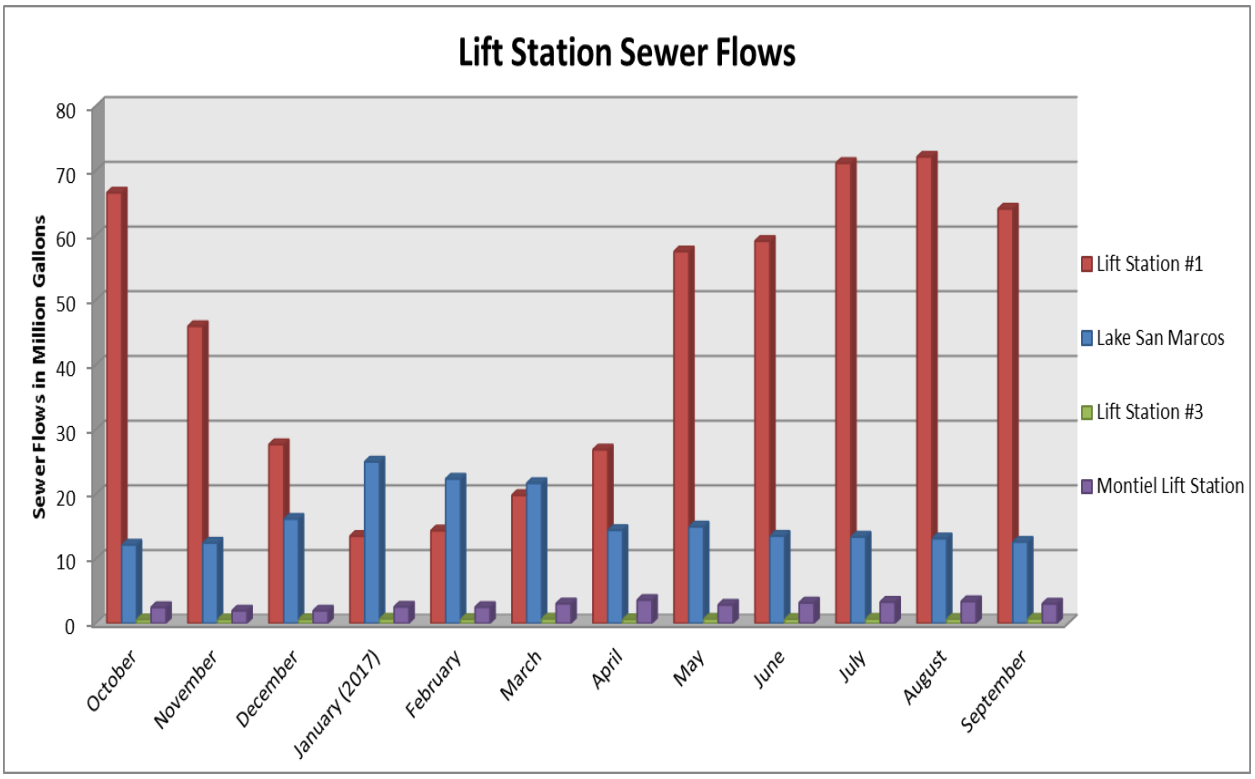
Smoke Testing of Sewer Lines in Feet
(Goal is to Smoke Test 3 areas per year based on suspected I&I)



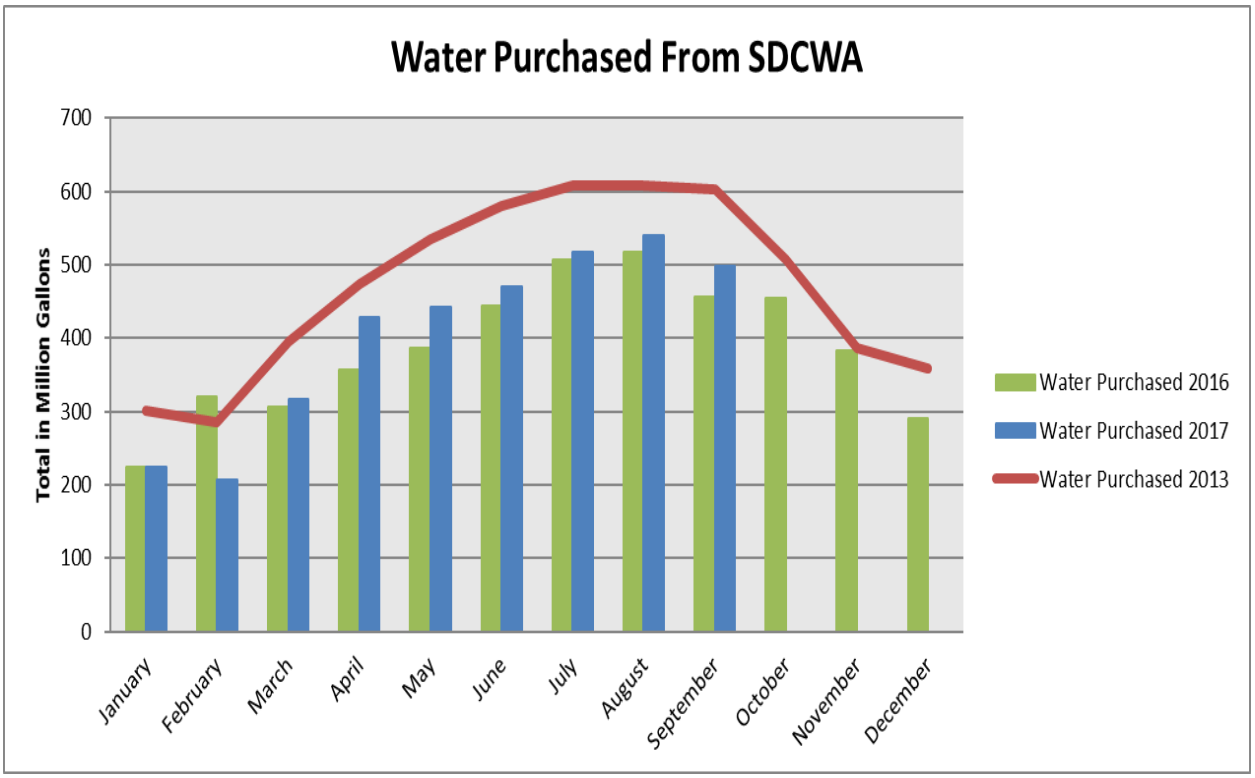
Sewer Line Cleaning Totals in Feet
(Goal is to clean 1,000,000 feet of gravity lines per year)



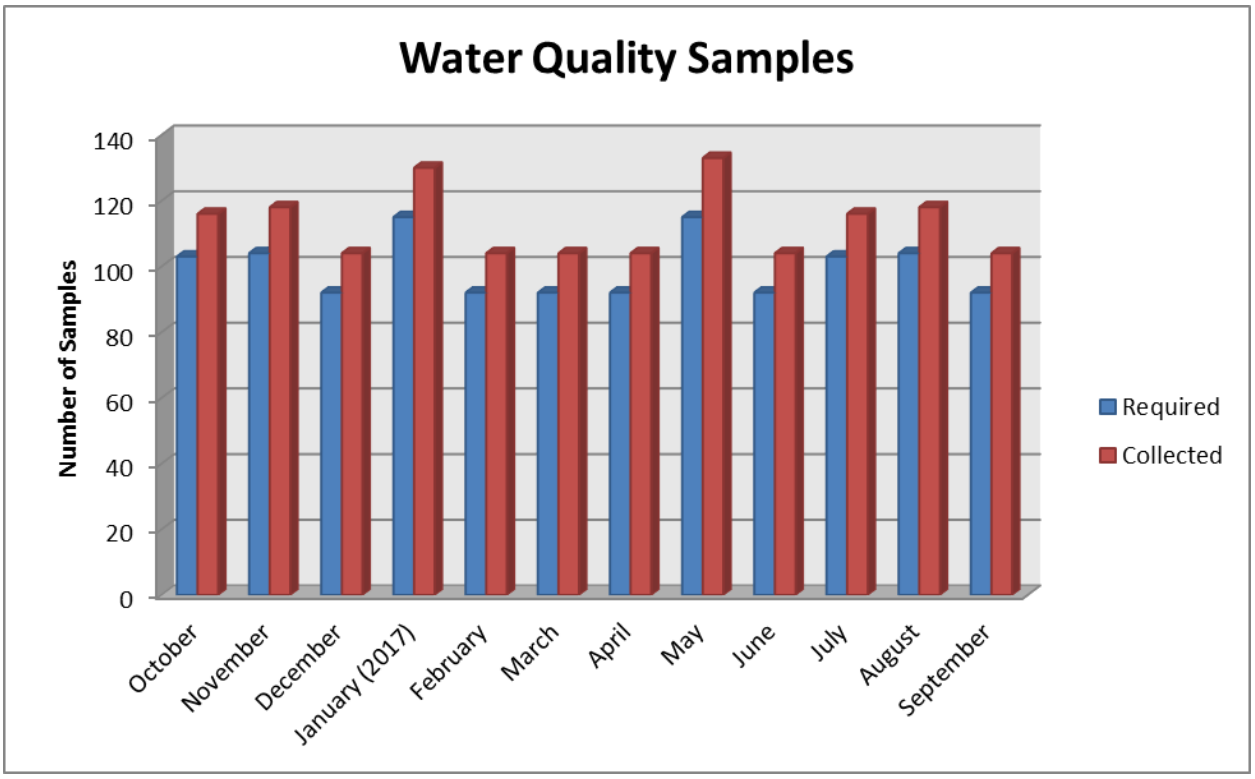
Customer Sewer Odor Complaints



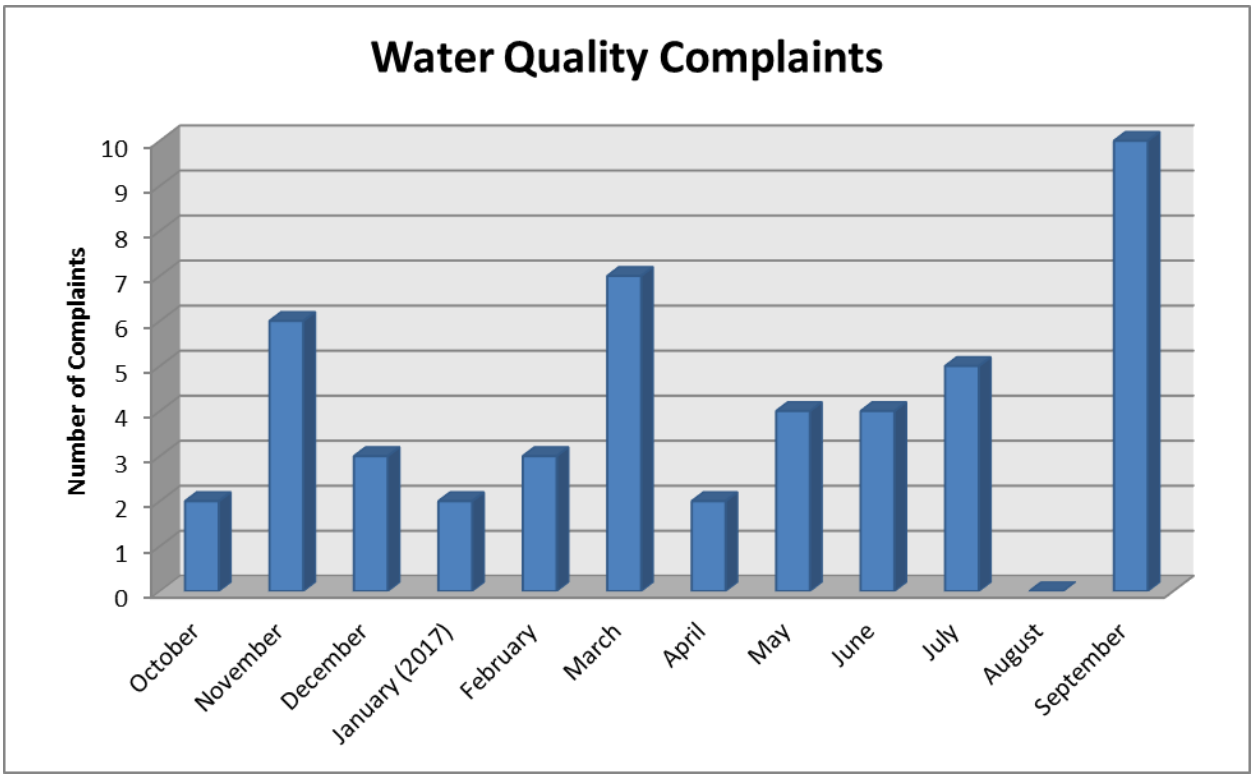
Sewer Flows Pumped from District Lift Stations



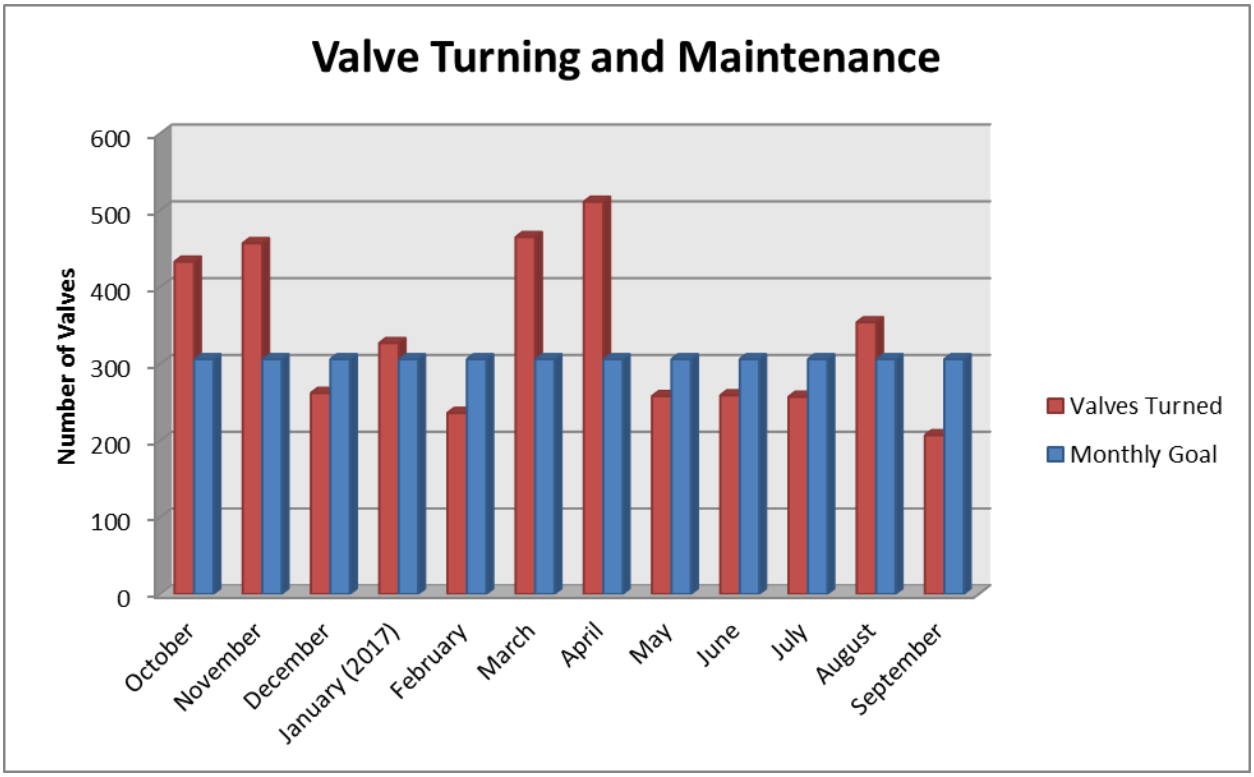
Water Purchased from the San Diego County Water Authority
(Includes water from the desalination and OMWD plants)



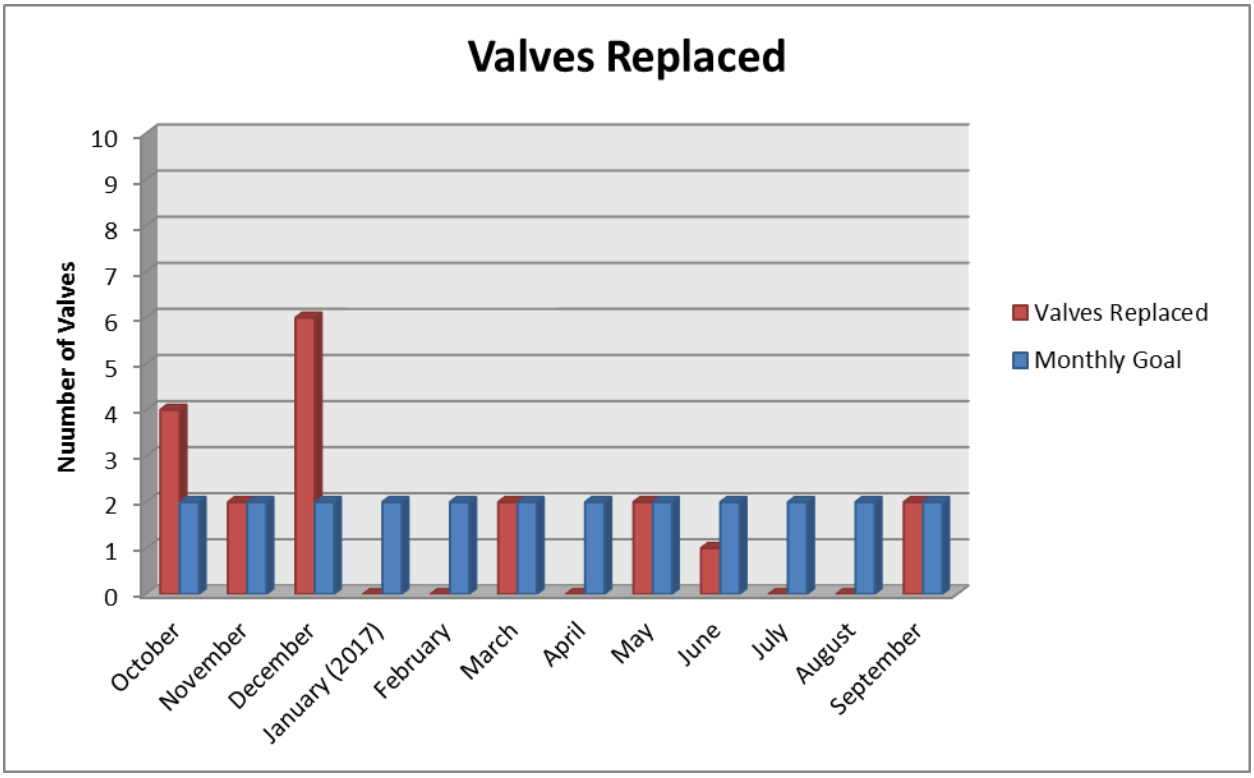
Bacteriological Water Quality Samples



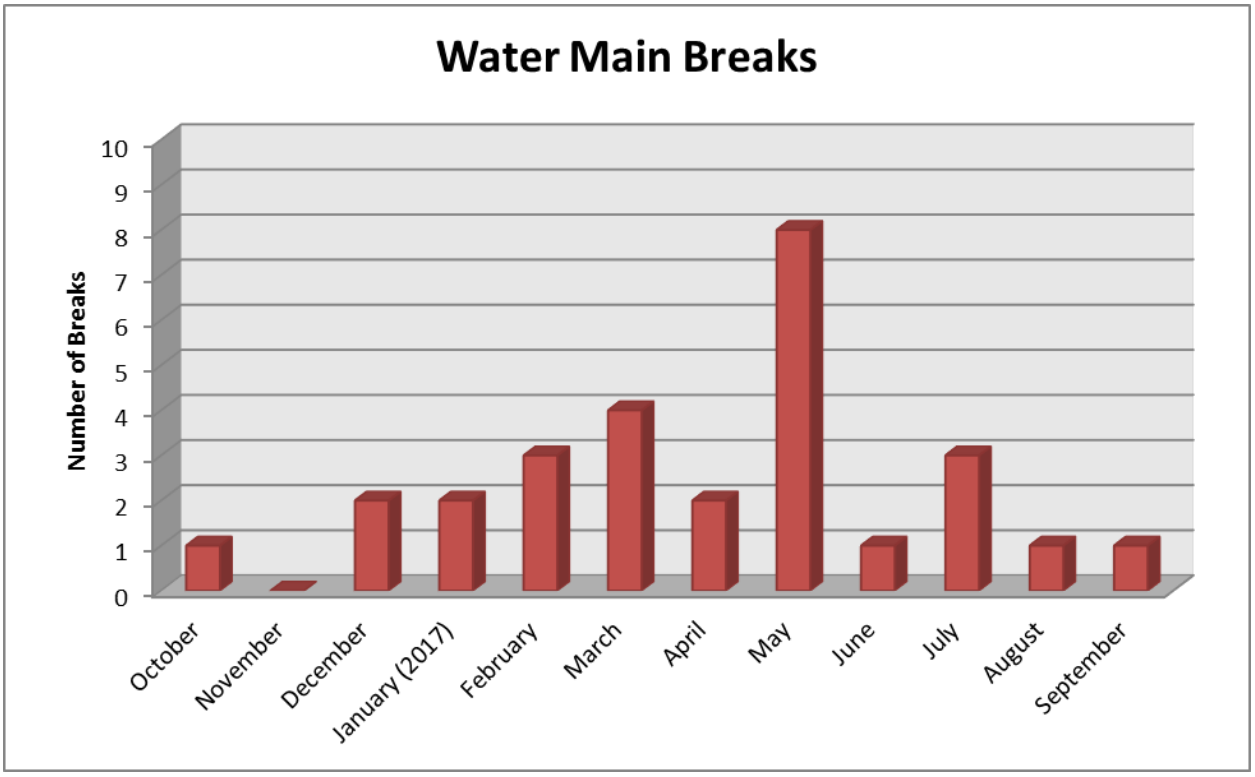
Customer Water Quality Complaints



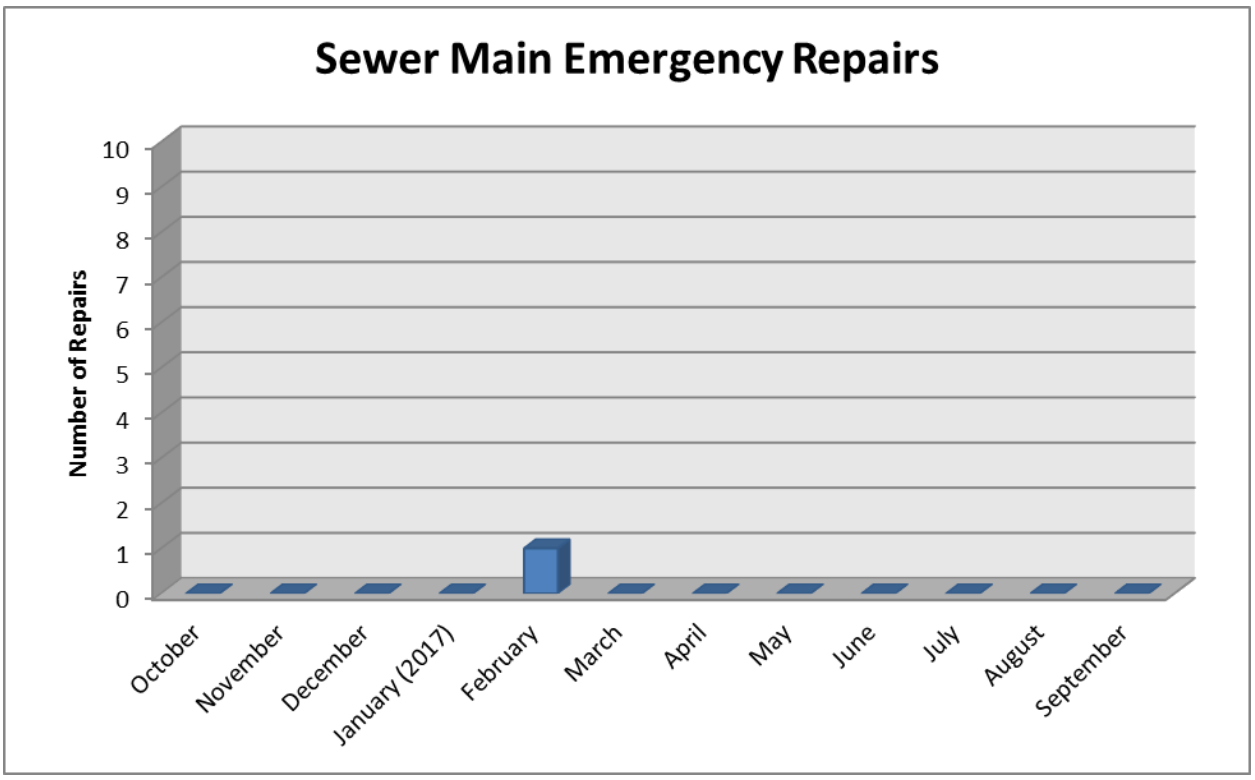
Water Valves Turned in the Distribution System
(Goal is to turn 50% of all valves every year or an average of 306/Month)



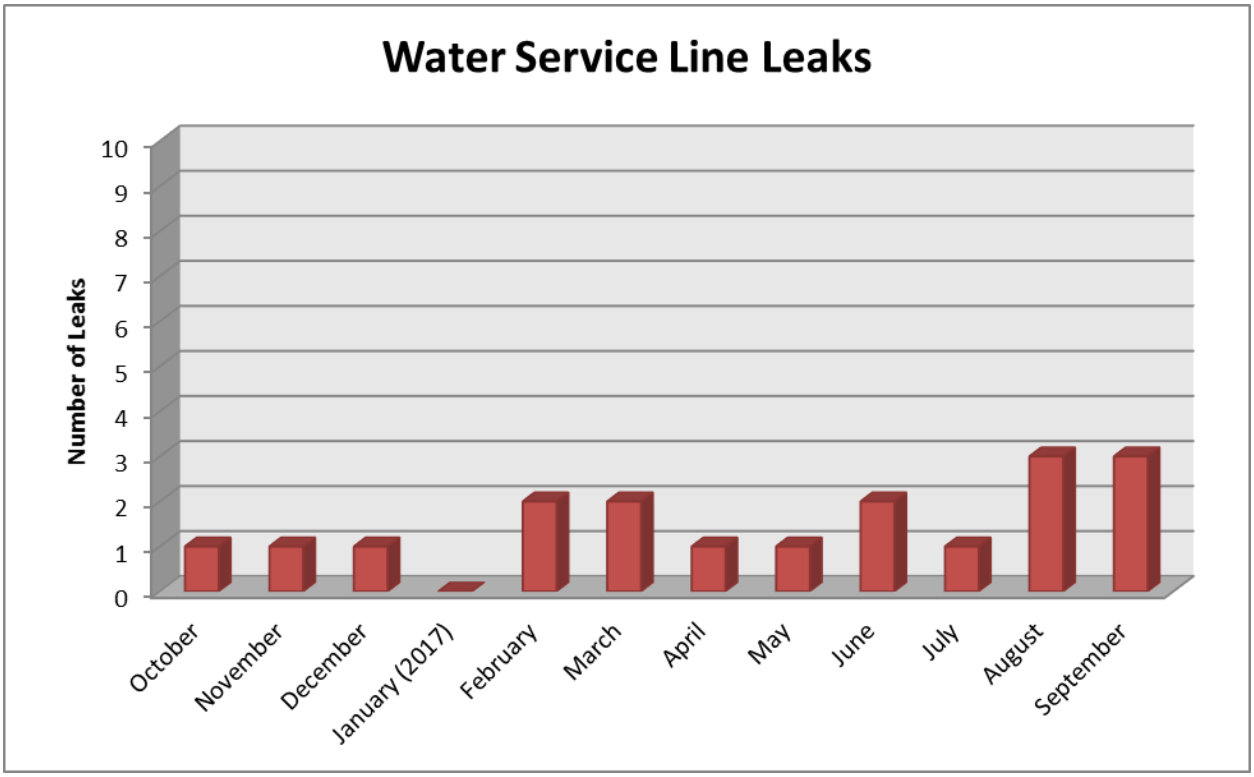
Water Valves Replaced in the Distribution System
(Goal is to replace 20 valves every year or around 2 per month)



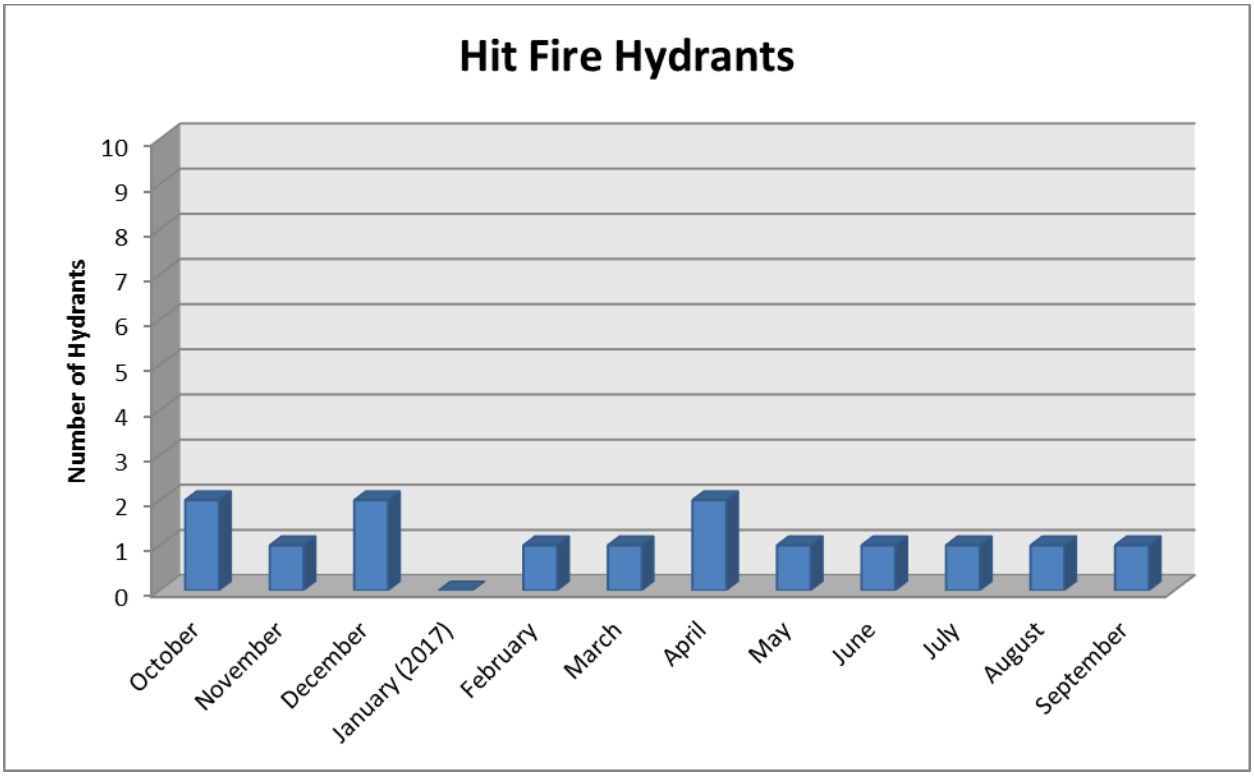
Water Mainline Breaks in the Distribution System



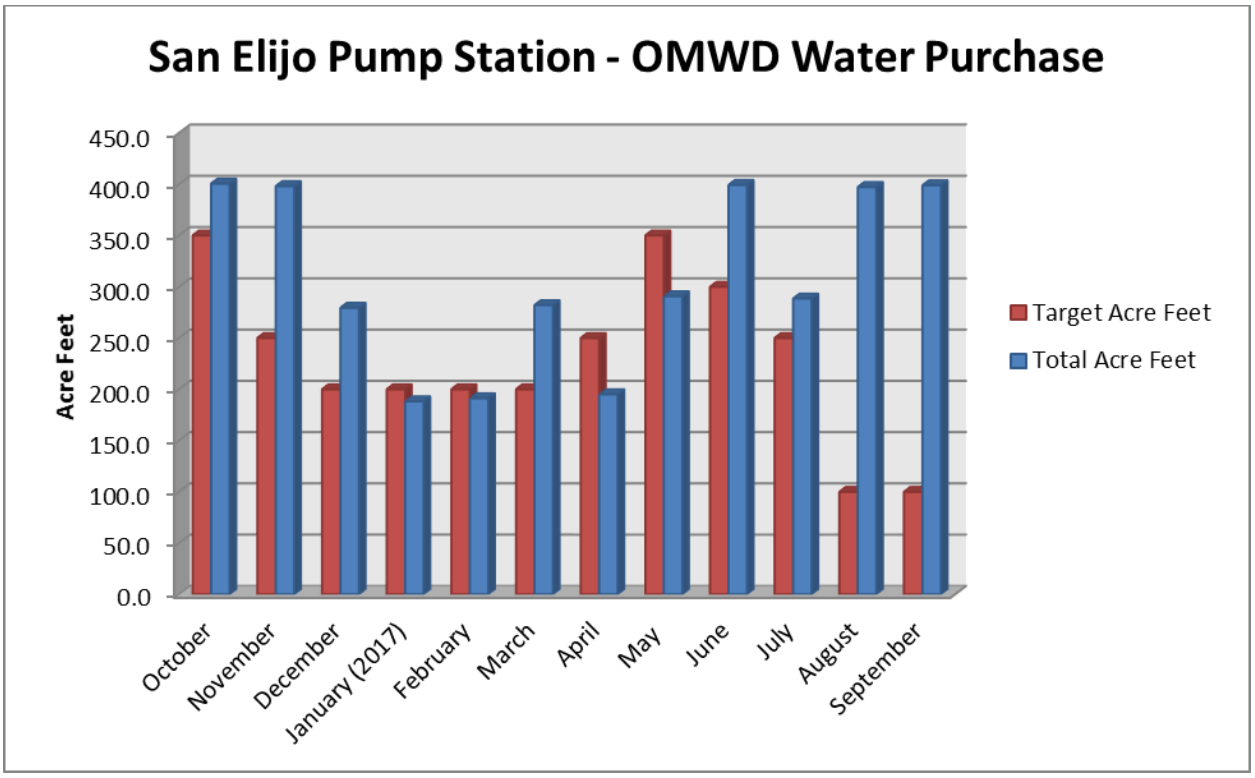
Sewer Main Emergency Repairs in the Collections System



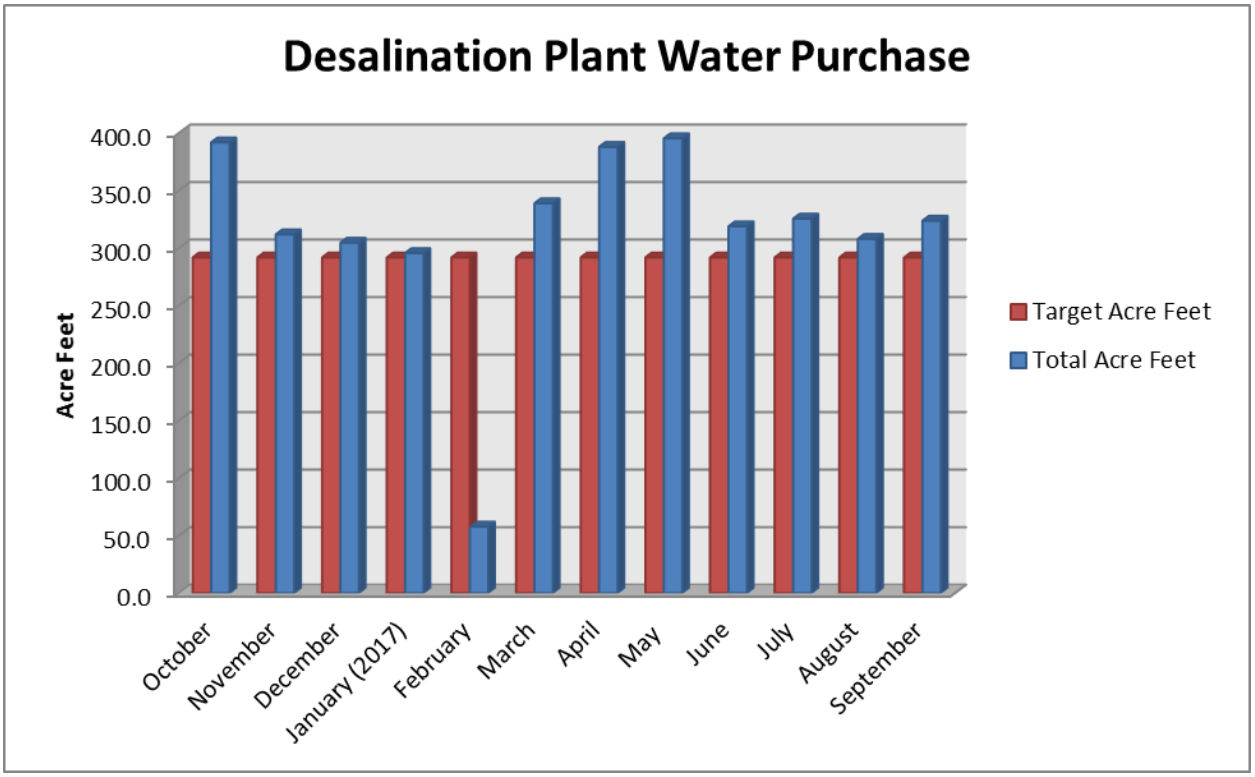
Water Service Line Leaks in the Distribution System



Fire Hydrants Hit in the Distribution System



Acre Feet of Water Purchased from Olivenhain MWD – San Elijo Pump Station



Acre Feet of Water Purchased from the Carlsbad Desalination Plant

DATE: **OCTOBER 18, 2017**
TO: **BOARD OF DIRECTORS**
SUBJECT: **FINAL ACCEPTANCE OF WATER AND SEWER IMPROVEMENTS FOR EASTGATE APN'S 219-270-70, 71, 72 & 73 (AFFIRMED HOUSING GROUP)**

BACKGROUND:

Affirmed Housing Group, owner of the project, has completed the installation of the water and sewer facilities for Eastgate. The 2.72-acre project site is located on the northwest corner of the intersection of Creekside Drive and Grand Ave.

DISCUSSION:

Water and/or sewer facilities are constructed by a developer. When complete, those facilities are accepted by the Board of Directors and become District property.

The project constructed approximately 959 feet of 12-inch diameter PVC water main and 909 feet of 8-inch diameter PVC sewer main throughout the project.

Upon final acceptance of the project, water and sewer service will be available to 42 multi-family residential units and commercial space.

The owner has provided the District with the required security to guarantee repairs due to failure of materials or workmanship for a period of one year. All current fees and charges have been paid to date.

Along with the water and sewer mains, assorted appurtenances were installed such as water meters, fire hydrants, gate valves, and sewer laterals and manholes.

The owner has paid a total of $231,686.00 in water capital facility fees and a total of $322,700.00 in wastewater capital facility fees, per Resolution No. 1441.

FISCAL IMPACT:

None. Future water and sewer revenues will offset costs of service.

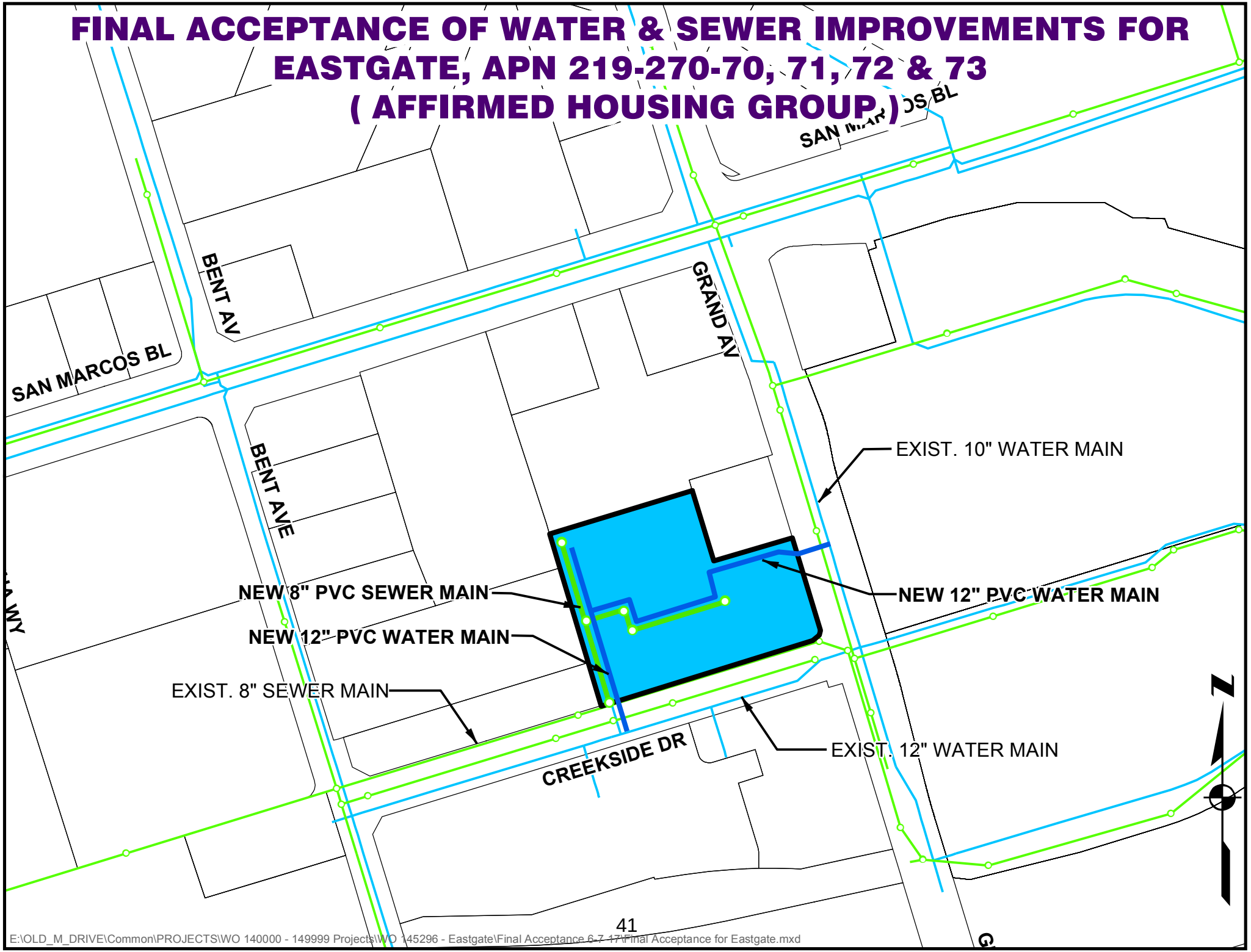
RECOMMENDATION:

Accept the project improvements and approve the filing of a Notice of Completion for the Eastgate project.

ATTACHMENTS:

2 Map Exhibits – 1 Plat Map & 1 Aerial

FINAL ACCEPTANCE OF WATER & SEWER IMPROVEMENTS FOR EASTGATE, APN 219-270-70, 71, 72 & 73 (AFFIRMED HOUSING GROUP)



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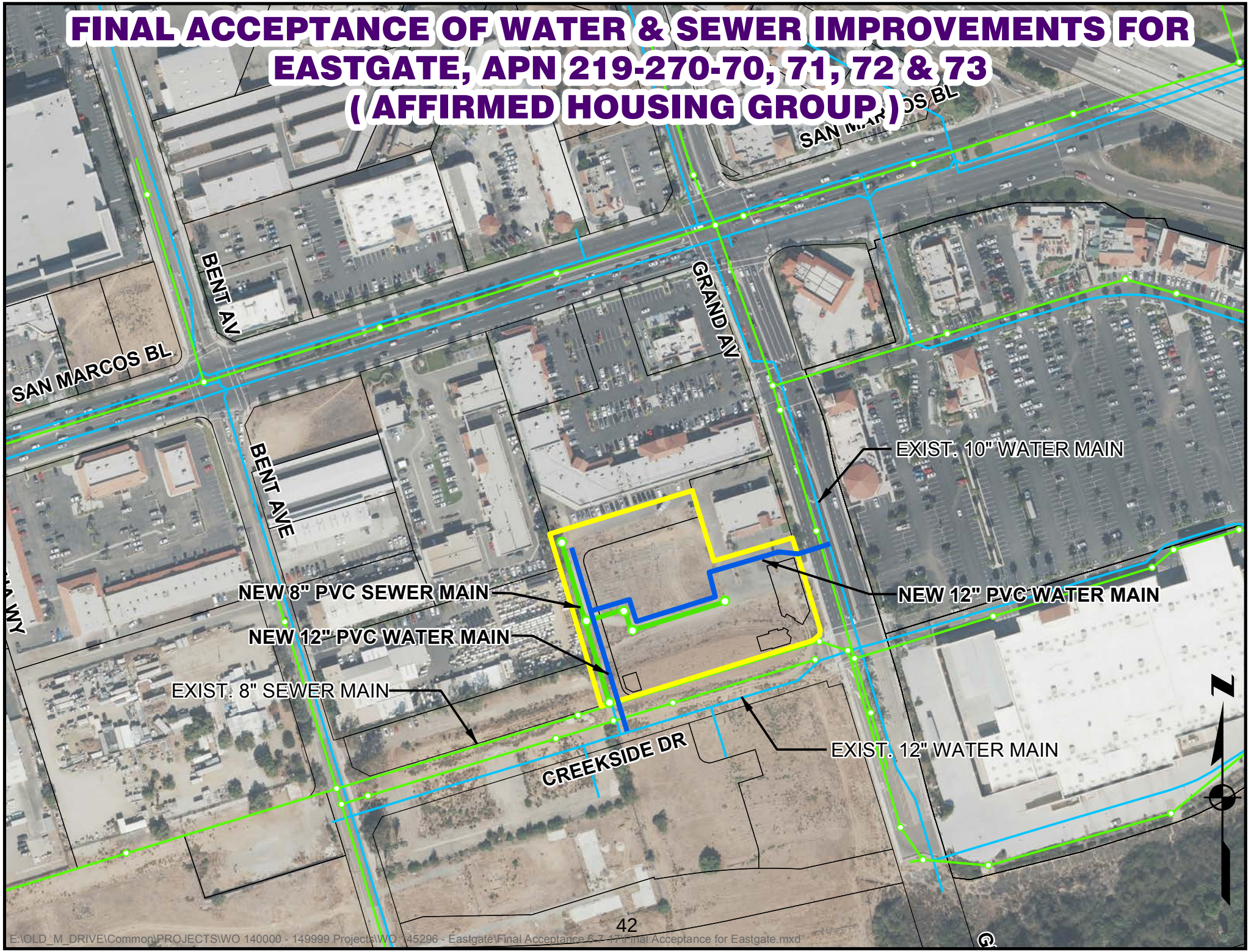
FINAL ACCEPTANCE OF WATER & SEWER IMPROVEMENTS FOR EASTGATE, APN 219-270-70, 71, 72 & 73 (AFFIRMED HOUSING GROUP)



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DATE: **OCTOBER 18, 2017**
TO: **BOARD OF DIRECTORS**
SUBJECT: **PROJECT ACCEPTANCE OF LIFT STATION NO. 1 WET WELL ROOM REPAIRS**

BACKGROUND:

The room above the Lift Station No.1 wet well room was in need of repairs due to the corrosion from the concentration of hydrogen sulfide gases. To control fugitive odors at the lift station, the main entrance to the wet well room was enclosed and carbon scrubbers added in May 2015. The beneficial reduction in odors has had the resultant side effect of increased corrosion to the metal, concrete, and masonry block surfaces within the room, including the ceiling, floors, walls, door jambs, and various fixtures. A combination of repairs, including polyurethane and epoxy coatings to the various surfaces and reinforcement of the ceiling was completed to prevent further deterioration.

The Board awarded the contract to O'Connell Engineering and Construction Inc. on April 5, 2017.

DISCUSSION:

All construction has been completed with one change order to modify the mounting of a safety railing from the wall to the floor. District staff provided inspection and construction management with specialty inspection by outside consultants.

FISCAL IMPACT:

The total cost and budget summary are as follows:

Budget	$295,000
Construction	$141,550
Change Order	$ 931
Design Consultant	$ 15,020
Specialty Inspection	$ 14,368
Staff	$ 23,870
Overhead	$ 43,638
Total	$239,377
Budget Surplus	$ 55,623

RECOMMENDATION:

Accept the project, authorize the filing of a Notice of Completion, and release of retention funds to the contractor following the 60-day notice period, provided no claims are filed.

PROJECT ACCEPTANCE OF LIFT STATION NO. 1
WET WELL ROOM REPAIRS


RAILING BEFORE


RAILING AFTER


CEILING BEFORE


CEILING AFTER

WET WELL ROOM REPAIRS

LIFT STATION NO. 1

PS

SAN MARCOS BLVD

N

E:\CAPITAL\LS1 Wet Well Room Protective Coating\LS1 Wet Well Rm Repairs.mxd

PROJECT ACCEPTANCE OF LIFT STATION NO. 1
WET WELL ROOM REPAIRS


RAILING BEFORE


RAILING AFTER


CEILING BEFORE


CEILING AFTER

WET WELL ROOM REPAIRS

LIFT STATION NO. 1

PS

SAN MARCOS BLVD

N

DATE: **OCTOBER 18, 2017**
TO: **BOARD OF DIRECTORS**
SUBJECT: **SENATE BILL 555 BY SENATOR LOIS WOLK (D-DAVIS) – URBAN RETAIL WATER SUPPLIERS: WATER LOSS MANAGEMENT**

BACKGROUND:

California Senate Bill (SB) 555, passed in October 2015, requires urban water suppliers to submit a completed and validated water loss audit annually to the California Department of Water Resources (DWR) starting in October 2017. The water loss audit must be completed in accordance with the method adopted by the American Water Works Association (AWWA) in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0.

The California-Nevada (CA-NV) Section of the AWWA is leading a broad group of stakeholders that came together in 2015 to combat water loss in California by forming the California Water Loss Control Collaborative (WLCC). This group includes utility personnel, industry organizations, non-profits as well as state entities. The WLCC project has been funded wholly or in part by the United States Environmental Protection Agency (EPA) and the State Water Resources Control Board (SWRCB), through the State Revolving Fund set-aside for technical assistance.

The WLCC in turn developed the Water Loss Technical Assistance Program (Water Loss TAP) to aid urban water suppliers in complying with SB 555. The Water Loss TAP program ushers utilities through a series of four work sessions or waves to accomplish this goal. The waves are defined as follows:

WAVE 1 (Completed on June 14, 2016)

Wave 1 is a day-long in-person work session (classroom) that covers the basics of water auditing and introduces water audit data validation. Objectives for Wave 1 include:

- Introduce Water Loss TAP
- Begin technical assistance
- Create utility water audit teams

WAVE 2 (Completed on December 6, 2016)

Wave 2 is a teleconference work session in which water auditing experts and each utility's water audit team examine the utility's most recent water audit in a two-hour interview. Objectives for Wave 2 include:

- Review the most recent water audit
- Discuss water audit data and data validity scores
- Amendments as needed

WAVE 3 (Completed February 28, 2017)

Wave 3 is a day-long in-person work session (classroom) that reinforces the water audit methodology before more deeply exploring water audit data validation and the connection between water auditing and water loss control.

- Continue technical assistance
- Connect water audits to water loss control
- Prepare for Wave 4

WAVE 4 (Completed September 14, 2017)

Wave 4 is a teleconference session in which water auditing experts and each utility's water audit team perform a Level 1 validation of the Fiscal Year (FY) or Calendar Year (CY) water audit that will be submitted to DWR.

- Level 1 validate Fiscal Year or Calendar Year water audit
- Prepare for submitting Level 1 validated water audits to DWR

DISCUSSION:

Water Loss TAP documents recommend that each water agency put together their own internal water audit team consisting of representatives from: Billing & Finance; Conservation; Engineering; and Supply & Operations. Vallecitos' water audit team includes:

Mike Arthur, Financial Analyst
Ed Pedrazzi, Operations & Maintenance Manager
Chris Robbins, Public Information/Conservation Supervisor
Rob Scholl, Development Services Senior Engineer

The initial workshops were designed to familiarize staff with the various definitions in water loss including:

• Water Supplied: the volume of treated water supplied to the retail water distribution system of a utility with the intent to serve customers. Water Supplied does not include bulk water exports. Therefore, Water Supplied is calculated by subtracting Water Exported from System Input Volume.

• Authorized Consumption: is water that is used by known customers of the water system. Authorized consumption is the sum of billed authorized consumption and unbilled authorized consumption and is a known quantity. An example of unbilled authorized consumption would be water used at the District's own facilities. It also includes water supplied to other water systems where the District supplies water to a customer, but another agency bills for it.

• Real Losses: also referred to as physical losses, are actual losses of water from the system and consist of leakage from transmission and distribution mains, leakage and overflows from the water system's storage tanks and leakage from service connections up to and including the meter. The software estimates these values unless the agency has better data.

• Apparent losses: occur when water that should be included as revenue generating water appears as a loss due to unauthorized actions or calculation error. Apparent losses consist of unauthorized consumption, customer metering inaccuracies, and systematic data handling errors in the meter reading and billing processes.

• Non-Revenue Water (NRW): is water that is not billed and no payment is received, such as fire suppression that is not reimbursed. It can be either authorized, or result from apparent and real losses. Unbilled Authorized Consumption is a component of NRW and consists of unbilled metered consumption and unbilled un-metered consumption.

Staff use these and other definitions along with the Water Audit Software (Excel spreadsheet) and District data to create a reporting worksheet.

The aforementioned staff participated in the four Wave workshops and completed the Wave 4 water audit on September 14, 2017. The final validated Water Audit data was submitted to DWR on September 28, 2017, and is included in this packet as attachments.

VALIDATED AUDIT RESULTS:

Results from the CY 2016 audit show the following values:

Water Supplied:	14,238.6 acre feet
Authorized Consumption:	13,364.9 acre feet
Water Losses:	873.7 acre feet
Non-Revenue Water:	949.0 acre feet

Numbers are assigned to each data component to describe confidence and accuracy of input data with 1 being low and 10 being high. The Water Audit Software includes a weighted scale of the components which notes the confidence in the specific data values. The District has a "Water Audit Data Validity Score" of 70. Reinhard Sturm, Water Systems Optimization CEO and President, states that the majority of the scores fall between 50 and 70.

The Free Water Audit Software conspicuously noted that for Vallecitos in CY 2016, the (customer) retail water costs were less than (or equal to) water production costs meaning the District is selling water below costs. This warning will probably reprise in the CY 2017 submittal as District rates will not rise until January 2018.

Validators suggested the District consider a customer meter testing program which tests a sample of random meters whose stratification (by size, age, or other characteristics) represents the entire customer meter stock. The lack of a District meter testing program contributed to one of the lowest ratings on the "Water Audit Data Validity Score." Implementing a meter testing program should increase that score in future years. This recommendation is being reviewed for implementation by the Finance Department.

This new process will become an annual process. It is expected that a standard for water system loss will be established through the SB 555 process and may be expressed as volume per capita or volume per connection, accounting for relevant factors such as infrastructure age and condition.

RECOMMENDATION:

For information only.

ATTACHMENTS:

Vallecitos Water District validated water audit submitted to DWR on September 28, 2017.

CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Validator Provided

Audit Information:

Utility: Vallecitos Water District PWS ID: 3710002

System Type: Potable Audit Period: Calendar 2016

Utility Representation: Robert Scholl, Mike Arthur, Chris Robins, Ed Pedrazzi

Validation Date: 9/14/2017 Call Time: 1 PM Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 70 Data Validity Band (Level): Band III (51-70)

ILI: 1.09 Real Loss: 30.60 (gal/conn/day) Apparent Loss: 4.06 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 6.4%

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Validator Information:

Water Audit Validator: Kate Gasner / Isabel Szendrey (support) Validator Qualifications: Contractor for CA-NV AWWA Water Loss TAP

CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Utility Provided

Water System Name: Vallecitos Water District **Water System ID Number:** CA3710002 **Water Audit Period:** Calendar 2016

Water Audit & Water Loss Improvement Steps:

Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

District has purchased construction meters for construction crews so that water used for flushing after water line repairs is now metered rather than estimated. Meters are also now installed in combination trucks (for sewer maintenance) so that that usage is also metered, rather than estimated.

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Glenn Pruim	General Manager		09/28/2017
Executive Name (Print)	Executive Position	Signature	Date

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: Vallecitos Water District (3710002)
Reporting Year: 2016 | 1/2016 - 12/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

				Pcnt:	Value:	
Volume from own sources:	n/a		acre-ft/yr			acre-ft/yr
Water imported:	7	17,054.400	acre-ft/yr	5		acre-ft/yr
Water exported:	7	2,815.800	acre-ft/yr	5		acre-ft/yr
WATER SUPPLIED:		**14,238.600**	acre-ft/yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	5	13,289.600	acre-ft/yr			
Billed unmetered:	n/a		acre-ft/yr			
Unbilled metered:	9	56.100	acre-ft/yr			
Unbilled unmetered:	10	19.200	acre-ft/yr		19.200	acre-ft/yr
AUTHORIZED CONSUMPTION:		**13,364.900**	acre-ft/yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

873.700 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:	35.597	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	33.448	acre-ft/yr	0.25%	acre-ft/yr
Systematic data handling errors:	5	33.224	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **102.268** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **771.432** acre-ft/yr

WATER LOSSES: **873.700** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **949.000** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	373.7	miles
Number of active AND inactive service connections:	9	22,508	
Service connection density:		60	conn./mile main
Are customer meters typically located at the curbstop or property line?		Yes	
Average length of customer service line:			(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	9	117.4	psi

COST DATA

Total annual cost of operating water system:	10	$37,789,386	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$3.70	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	7	$2,659.73	$/acre-ft	Use Customer Retail Unit Cost to value real losses

Retail costs are less than (or equal to) production costs; please review and correct if necessary

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 70 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

Water Audit Report for: Vallecitos Water District (3710002)
Reporting Year: 2016 | 1/2016 - 12/2016

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 70 out of 100 ***

System Attributes:

	Apparent Losses:	102.268	acre-ft/yr
+	Real Losses:	771.432	acre-ft/yr
=	Water Losses:	873.700	acre-ft/yr
	? pidable Annual Real Losses (UARL):	709.85	acre-ft/yr
	Annual cost of Apparent Losses:	$164,828	
	Annual cost of Real Losses:	$2,051,800	Valued at Variable Production Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	6.7%	
	Non-revenue water as percent by cost of operating system:	6.4%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	4.06	gallons/connection/day
	Real Losses per service connection per day:	30.60	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.26	gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL):	771.43	acre-feet/year
? structure Leakage Index (ILI) [CARL/UARL]:	1.09	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

AWWA Free Water Audit Software:
User Comments

American Water Works

Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	Infrastructure leakage index should probably be greater than 1, or this will raise eyebrows

Audit Item	Comment
Volume from own sources:	
Vol. from own sources: Master meter error adjustment:	
Water imported:	This includes total imports from the San Diego County Water Authority such as desalinated water from the Bud C. Lewis Treatment Plant and exchange water from the Olivenhain Municipal Water District.
Water imported: master meter error adjustment:	This is a weighed average of the calibrated meter error from the District's five turnout connections with the San Diego County Water Authority
Water exported:	This includes total water exports through exchange meters with the City of Carlsbad, the Vista Irrigation District and the City of Escondido
Water exported: master meter error adjustment:	
Billed metered:	Vallecitos Water District has effectively metered 100% of its accounts with AMR well underway for over 90% of its meters. At least 95% of the District's meters are 10 years old or younger. However, some large volume meters are still 20 to 30 years old and are known to under-read.
Billed unmetered:	
Unbilled metered:	This includes Vallecitos Water District's own water usage and is presented as "Non Bill" on the supporting Water Production/Sales Report. Usage is metered reliably and with proper priority.
Unbilled unmetered:	Operational uses include estimated flushing volumes. Staff attempts to quantify the flows from such events using standard formulae

Audit Item	Comment
Unauthorized consumption:	
Customer metering inaccuracies:	Ongoing meter replacement means that the District has replaced over 95% of its meters within the past 10 years. Rountine meter testing for accuracy is not performed at this time
Systematic data handling errors:	Computerized billing system includes an array of reports that are utilized to confrim billing data and system functuality. Check are made each billing cycle to red flag suspect and zero read accounts.
Length of mains:	This figure includes 358 miles of actual water distribution mains, plus an estimated 15 miles of fire hydrant service laterals. District GIS contains all as-builted water facilities and is believed to be very accurate.
Number of active AND inactive service connections:	Well-managed computerized information management system in place to track meter status changes. Periodic field checks and system audits are conducted to verify accuracy. Includes all inactive accounts, including those that are not registered to a specific recipient.
Average length of customer service line:	
Average operating pressure:	Obtained by averaging the pressures at all pipeline junctions within the District's water distribution model. The District's water distribution system is composed of 26 well-managed pressure zones. Both SCADA and the water distribution model give very accurate pressure readings throughout the system.
Total annual cost of operating water system:	Electronic cost accounting system is in place and all water system costs are tracked. Data is checked and audited annually.
Customer retail unit cost (applied to Apparent Losses):	Tiered water rate structure is clearly defined by District policy and is applied reliably in billing operations. The retail unit cost given in the Reporting Worksheet represents the total water sales plus the fixed monthly Ready-to-Serve costs for the meters, all divided by the total billed metered water consumption for the year.
Variable production cost (applied to Real Losses):	Reliable electronic, industry-standard accounting system in place to track production costs. The production cost listed includes the cost of imported water from the San Diego County Water Authority plus the District's costs toward distributing this water, all divided by the total amount of water produced (imported) for the year.

AWWA Free Water Audit Software: Water Balance

WAS v5.0

Water Audit Report for:	**Vallecitos Water District (3710002)**	
Reporting Year:	**2016**	**1/2016 - 12/2016**
Data Validity Score:	**70**	

Own Sources (Adjusted for known errors) *0.000*	**Water Exported** *2,815.800*	**Billed Water Exported**			
	Water Supplied *14,238.600*	**Authorized Consumption** *13,364.900*	**Billed Authorized Consumption** *13,289.600*	**Billed Metered Consumption (water exported is removed)** *13,289.600*	**Revenue Water** 13,289.600
				Billed Unmetered Consumption *0.000*	
			Unbilled Authorized Consumption *75.300*	**Unbilled Metered Consumption** *56.100*	**Non-Revenue Water (NRW)** *949.000*
				Unbilled Unmetered Consumption *19.200*	
		Water Losses *873.700*	**Apparent Losses** *102.268*	**Unauthorized Consumption** *35.597*	
				Customer Metering Inaccuracies *33.448*	
				Systematic Data Handling Errors *33.224*	
Water Imported *17,054.400*			**Real Losses** *771.432*	**Leakage on Transmission and/or Distribution Mains** *Not broken down*	
				Leakage and Overflows at Utility's Storage Tanks *Not broken down*	
				Leakage on Service Connections *Not broken down*	

AWWA Free Water Audit Software:
Dashboard

WAS v5.0

The graphic below is a visual representation of the Water Balance with bar heights propotional to the volume of the audit components

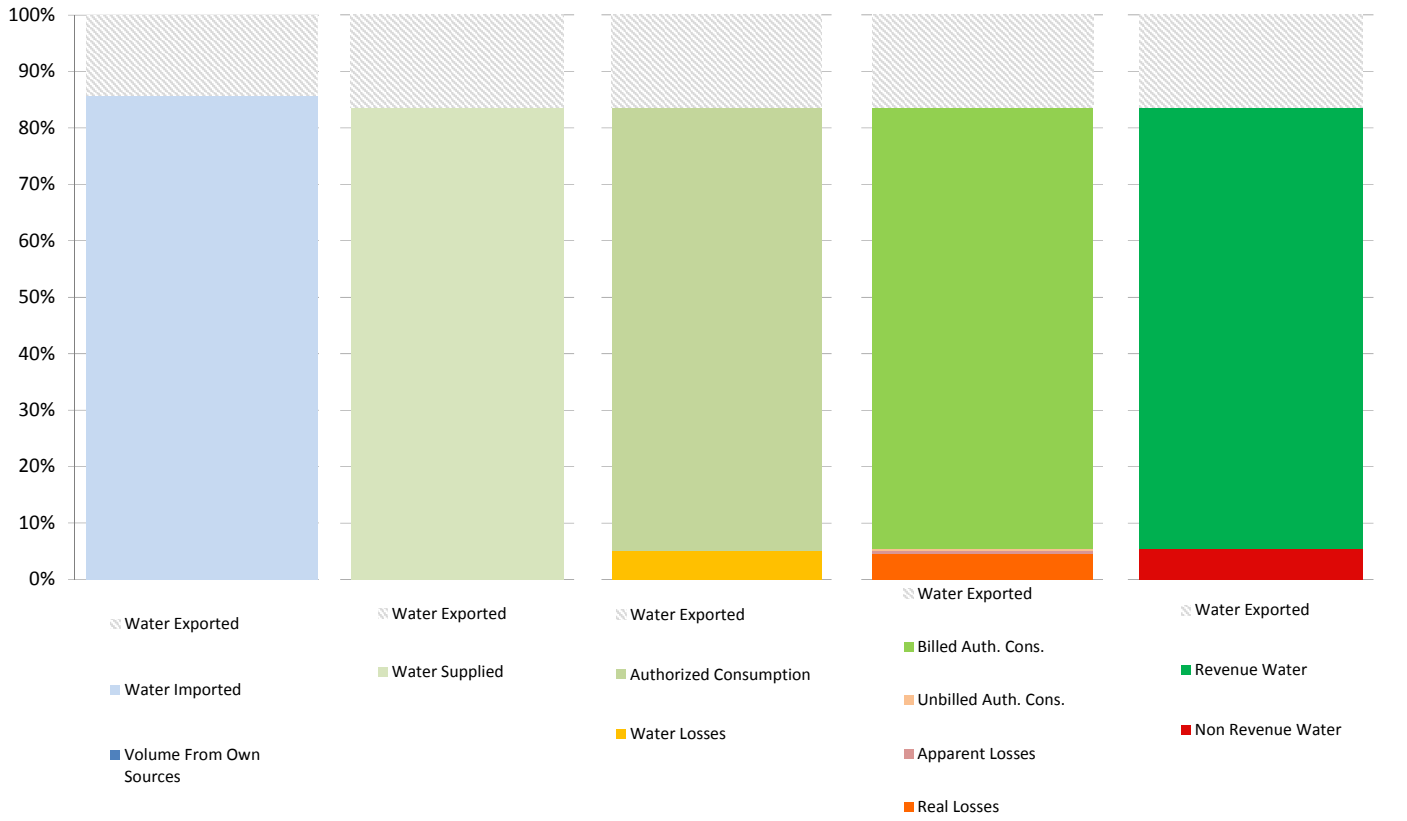
Water Audit Report for: **Vallecitos Water District (3710002)**

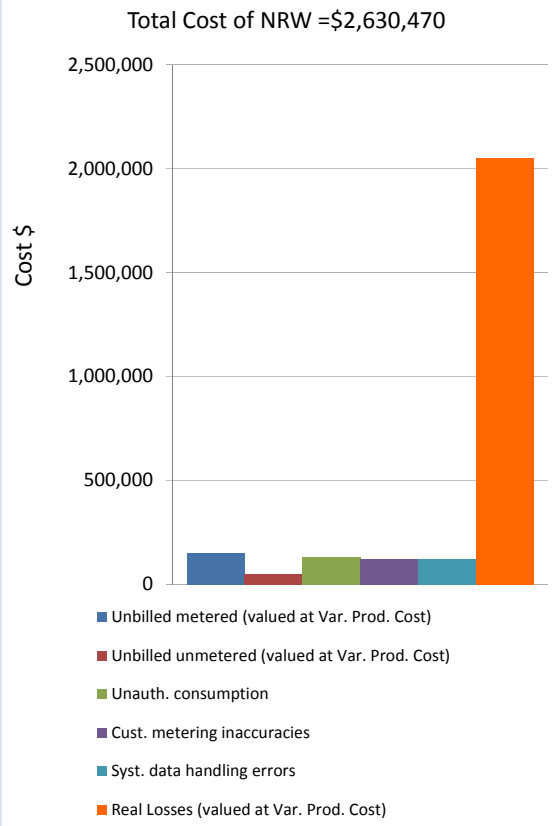
Reporting Year: **2016** **1/2016 - 12/2016**

Data Validity Score: **70**

○ Show me the VOLUME of Non-Revenue Water

◉ Show me the COST of Non-Revenue Water





AWWA Free Water Audit Software: Grading Matrix

WAS 5.0

The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
WATER SUPPLIED											
Volume from own sources:	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		to qualify for 2: Organize and launch efforts to collect data for determining volume from own sources	to qualify for 4: Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		to qualify for 6: Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		to qualify for 8: Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system: tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	to qualify for 4: Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		to qualify for 6: Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		to qualify for 8: Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		to qualify for 10: Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Imported Volume" component: *(Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.)*		to qualify for 2: Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	To qualify for 4: Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		to qualify for 6: Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		to qualify for 8: Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmetered, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Importer. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	to qualify for 4: Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		to qualify for 6: Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		to qualify for 8: Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		to qualify for 10: Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component: *(Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.)*		to qualify for 2: Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	To qualify for 4: Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetered exported water interconnections and replace obsolete/defective meters		to qualify for 6: Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetered exported water interconnections and replacement of obsolete/defective meters.		to qualify for 8: Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis, with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.	to qualify for 4: Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		to qualify for 6: Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		to qualify for 8: Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		to qualify for 10: Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities; at least every five years.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
AUTHORIZED CONSUMPTION											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted, with less than 50% meter read success rate, remaining accounts' consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based, billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records exist, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; or at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; or minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.	to qualify for 4: Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.		to qualify for 6: Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.		to qualify for 8: Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.		to qualify for 10: Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.		to maintain 10: Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter; i.e. no intentionally unmetered accounts exist	Water utility policy does not require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does not require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy does require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy does require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy does require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy does require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		to qualify for 2: Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.	to qualify for 4: Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.		to qualify for 6: Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significant reduce the number of unmetered accounts		to qualify for 8: Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.		to qualify for 10: Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.		to maintain 10: Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist; and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.	Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.	Conditions between 2 and 4	Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.	Conditions between 4 and 6	Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.	Conditions between 6 and 8	Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.	Conditions between 8 and 10	Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		to qualify for 2: Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.	to qualify for 4: Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.		to qualify for 6: Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.		to qualify for 8: Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.		to qualify for 10: Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.		to maintain 10: Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.
Unbilled unmetered:		Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.	Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.	Conditions between 2 and 4	Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).	Default value of 1.25% of system input volume is employed	Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.	Conditions between 6 and 8	Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.	Conditions between 8 and 10	Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		to qualify for 5: Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 2: Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushing).	to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 4: Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).		to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, unmetered consumption is usually a relatively small quantity component, and other larger-quantity components should take priority.	to qualify for 6 or greater: Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.		to qualify for 10: Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.		to maintain 10: Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.
APPARENT LOSSES											

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to quality for 8: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetered customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but needs refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		to qualify for 2: Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	to qualify for 4: Finalize written policy and procedures for activation of new billing accounts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		to qualify for 6: Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		to qualify for 8: Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		to qualify for 10: Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		to maintain 10: Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
SYSTEM DATA											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in a uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographical Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		to qualify for 2: Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	to qualify for 4: Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		to qualify for 6: Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		to qualify for 8: Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		to qualify for 10: Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		to maintain 10: Continue with standardization and random field validation to improve the completeness and accuracy of the system.
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well-managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	**Note: The number of Service Connections does not include fire hydrant leads/lines connecting the hydrant to the water main**	to qualify for 2: Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	to qualify for 4: Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		to qualify for 6: Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		to qualify for 8: Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		to qualify for 10: Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		to maintain 10: Continue with standardization and random field validation to improve knowledge of system.
	Note: if customer water	Gradings 1-9 apply if customer properties are unmetered, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gradings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									Either of two conditions can be met for a grading of 10:

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Average length of customer service line:	meters are located outside of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Working asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet . b). Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		to qualify for 2: Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	to qualify for 4: Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		to qualify for 6: Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		to qualify for 8: Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		to qualify for 10: Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		to maintain 10: Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system, occasional open boundary valves are discovered that breech pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breech pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.
Improvements to attain higher data grading for "Average Operating Pressure" component:		to qualify for 2: Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	to qualify for 4: Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		to qualify for 6: Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		to qualify for 8: Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		to qualify for 10: Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		to maintain 10: Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for real-time pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
COST DATA											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		to qualify for 2: Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	to qualify for 4: Implement an electronic cost accounting system, structured according to accounting standards for water utilities		to qualify for 6: Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		to qualify for 8: Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		to qualify for 10: Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		to maintain 10: Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		to qualify for 2: Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	to qualify for 4: Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		to qualify for 6: Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	Launch effort to fully meter the customer population and charge rates based upon water volumes	to qualify for 8: Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		to qualify for 10: Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		to maintain 10: Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk imported water, and unit purchase cost serves as the variable production cost.
Improvements to attain higher data grading for "Variable Production Cost" component:		to qualify for 2: Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	to qualify for 4: Implement an electronic cost accounting system, structured according to accounting standards for water utilities		to qualify for 6: Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		to qualify for 8: Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.) Arrange to conduct audits by a knowledgeable third-party at least once every three years.		to qualify for 10: Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		to maintain 10: Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively

Average Length of Customer Service Line

The three figures shown on this worksheet display the assignment of the Average Length of Customer Service Line, Lp, for the three most common piping configurations.

Figure 1 shows the configuration of the water meter outside of the customer building next to the curb stop valve. In this configuration Lp = 0 since the distance between the curb stop and the customer metering point is essentially zero.

Figure 2 shows the configuration of the customer water meter located inside the customer building, where Lp is the distance from the curb stop to the water meter.

Figure 3 shows the configuration of an unmetered customer building , where Lp is the distance from the curb stop to the first point of customer water consumption, or, more simply, the building line.

In any water system the Lp will vary notably in a community of different structures, therefore the average Lp value is used and this should be approximated or calculated if a sample of service line measurements has been gathered.

Click for more information

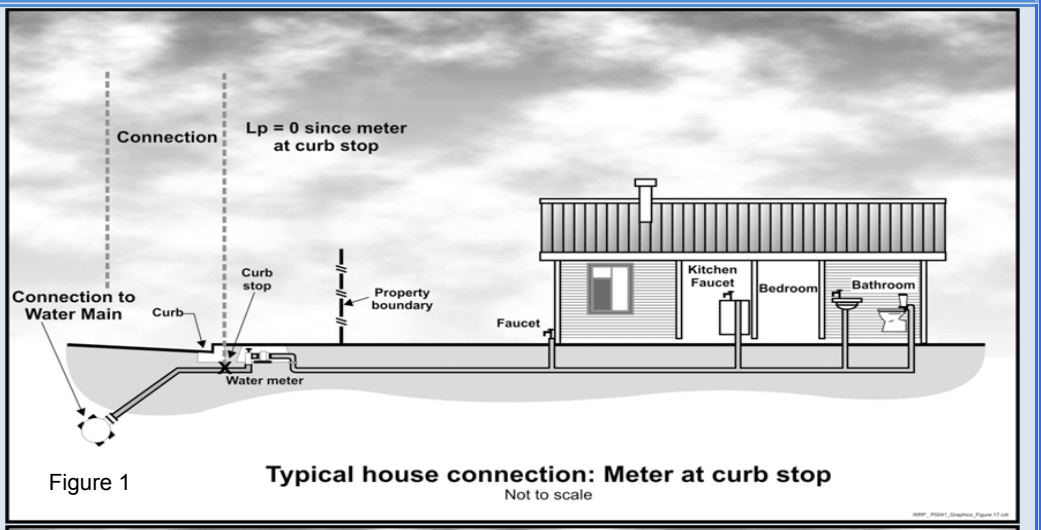


Figure 1 **Typical house connection: Meter at curb stop**
Not to scale

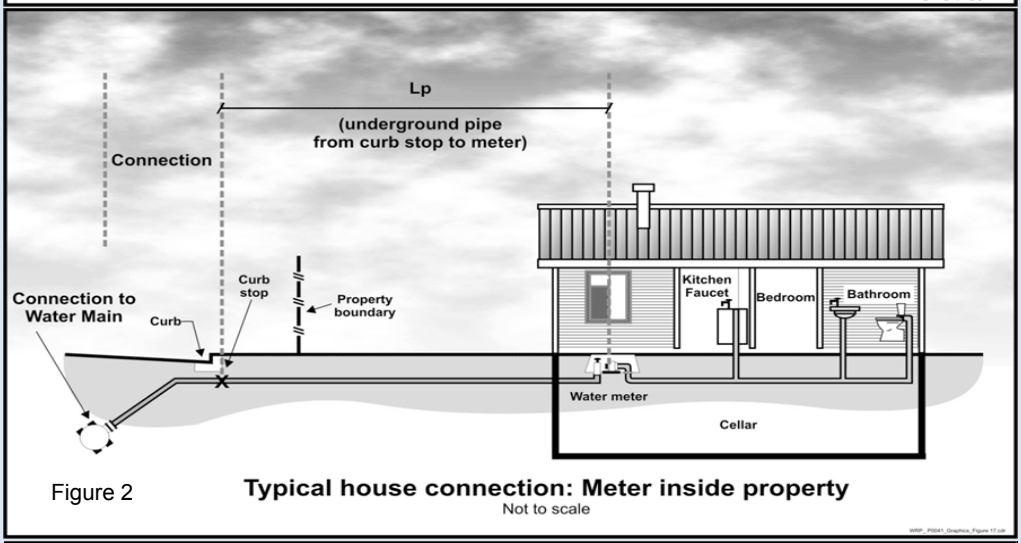


Figure 2 **Typical house connection: Meter inside property**
Not to scale

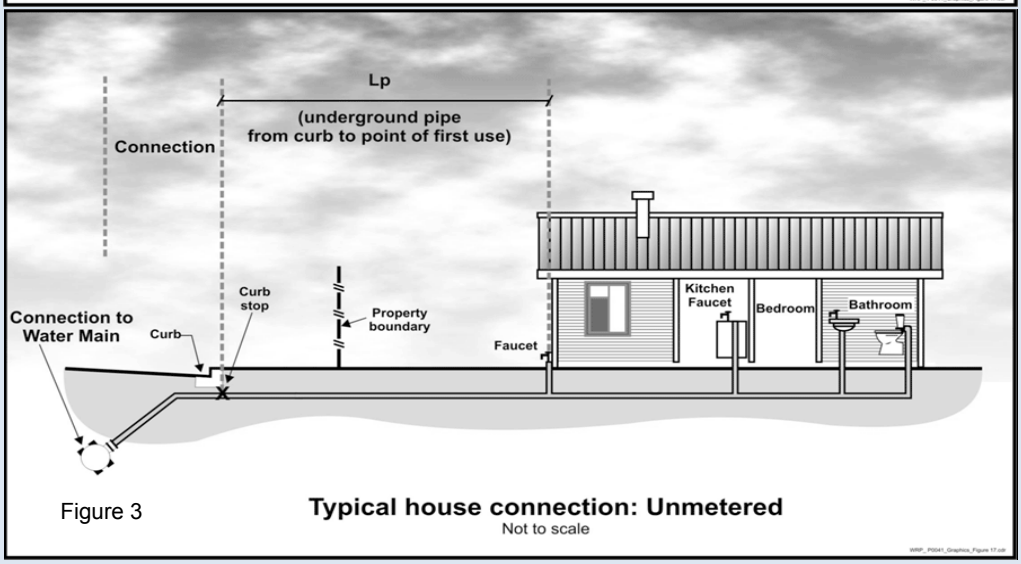
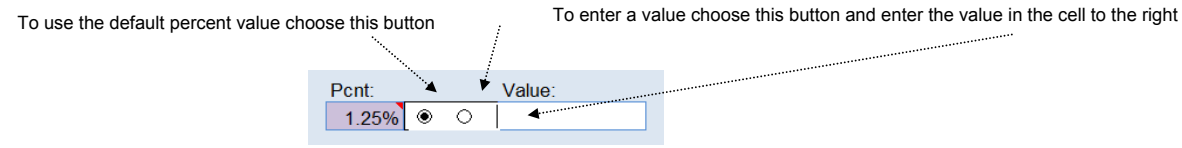


Figure 3 **Typical house connection: Unmetered**
Not to scale

Item Name	Description
Apparent Losses Find	= unauthorized consumption + customer metering inaccuracies + systematic data handling errors Apparent Losses include all types of inaccuracies associated with customer metering (worn meters as well as improperly sized meters or wrong type of meter for the water usage profile) as well as systematic data handling errors (meter reading, billing, archiving and reporting), plus unauthorized consumption (theft or illegal use). NOTE: Over-estimation of Apparent Losses results in under-estimation of Real Losses. Under-estimation of Apparent Losses results in over-estimation of Real Losses.
AUTHORIZED CONSUMPTION Find	= billed water exported + billed metered + billed unmetered + unbilled metered + unbilled unmetered consumption The volume of metered and/or unmetered water taken by registered customers, the water utility's own uses, and uses of others who are implicitly or explicitly authorized to do so by the water utility; for residential, commercial, industrial and public-minded purposes. Typical retail customers' consumption is tabulated usually from established customer accounts as billed metered consumption, or - for unmetered customers - billed unmetered consumption. These types of consumption, along with billed water exported, provide revenue potential for the water utility. **Be certain to tabulate the water exported volume as a separate component and do not "double-count" it by including in the billed metered consumption component as well as the water exported component.** Unbilled authorized consumption occurs typically in non-account uses, including water for fire fighting and training, flushing of water mains and sewers, street cleaning, watering of municipal gardens, public fountains, or similar public-minded uses. Occasionally these uses may be metered and billed (or charged a flat fee), but usually they are unmetered and unbilled. In the latter case, the water auditor may use a default value to estimate this quantity, or implement procedures for the reliable quantification of these uses. This starts with documenting usage events as they occur and estimating the amount of water used in each event. (See Unbilled unmetered consumption)
View Service Connection Diagram **Average length of customer service line** Find	This is the average length of customer service line, Lp, that is owned and maintained by the customer; from the point of ownership transfer to the customer water meter, or building line (if unmetered). The quantity is one of the data inputs for the calculation of Unavoidable Annual Real Losses (UARL), which serves as the denominator of the performance indicator: Infrastructure Leakage Index (ILI). The value of Lp is multiplied by the number of customer service connections to obtain a total length of customer owned piping in the system. The purpose of this parameter is to account for the unmetered service line infrastructure that is the responsibility of the customer for arranging repairs of leaks that occur on their lines. In many cases leak repairs arranged by customers take longer to be executed than leak repairs arranged by the water utility on utility-maintained piping. Leaks run longer - and lose more water - on customer-owned service piping, than utility owned piping. If the customer water meter exists near the ownership transfer point (usually the curb stop located between the water main and the customer premises) this distance is zero because the meter and transfer point are the same. This is the often encountered configuration of customer water meters located in an underground meter box or "pit" outside of the customer's building. The Free Water Audit Software asks a "Yes/No" question about the meter at this location. If the auditor selects "Yes" then this distance is set to zero and the data grading score for this component is set to 10. If water meters are typically located inside the customer premise/building, or properties are unmetered, it is up to the water auditor to estimate a system-wide average Lp length based upon the various customer land parcel sizes and building locations in the service area. Lp will be a shorter length in areas of high density housing, and a longer length in areas of low density housing and varied commercial and industrial buildings. General parcel demographics should be employed to obtain a composite average Lp length for the entire system. Refer to the "Service Connection Diagram" worksheet for a depiction of the service line/metering configurations that typically exist in water utilities. This worksheet gives guidance on the determination of the Average Length, Lp, for each configuration.
Average operating pressure Find	This is the average pressure in the distribution system that is the subject of the water audit. Many water utilities have a calibrated hydraulic model of their water distribution system. For these utilities, the hydraulic model can be utilized to obtain a very accurate quantity of average pressure. In the absence of a hydraulic model, the average pressure may be approximated by obtaining readings of static water pressure from a representative sample of fire hydrants or other system access points evenly located across the system. A weighted average of the pressure can be assembled; but be sure to take into account the elevation of the fire hydrants, which typically exist several feet higher than the level of buried water pipelines. If the water utility is compiling the water audit for the first time, the average pressure can be approximated, but with a low data grading. In subsequent years of auditing, effort should be made to improve the accuracy of the average pressure quantity. This will then qualify the value for a higher data grading.
Billed Authorized Consumption	All consumption that is billed and authorized by the utility. This may include both metered and unmetered consumption. See "Authorized Consumption" for more information.
Billed metered consumption Find	All metered consumption which is billed to retail customers, including all groups of customers such as domestic, commercial, industrial or institutional. **It does NOT include water supplied to neighboring utilities (water exported) which is metered and billed. Be sure to subtract any consumption for exported water sales that may be included in these billing roles. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.** The metered consumption data can be taken directly from billing records for the water audit period. The accuracy of yearly metered consumption data can be refined by including an adjustment to account for customer meter reading lag time since not all customer meters are read on the same day of the meter reading period. However additional analysis is necessary to determine the lag time adjustment value, which may or may not be significant.
Billed unmetered consumption Find	All billed consumption which is calculated based on estimates or norms from water usage sites that have been determined by utility policy to be left unmetered. This is typically a very small component in systems that maintain a policy to meter their customer population. However, this quantity can be the key consumption component in utilities that have not adopted a universal metering policy. **This component should NOT include any water that is supplied to neighboring utilities (water exported) which is unmetered but billed. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.**

Item Name	Description
Customer metering inaccuracies Find	Apparent water losses caused by the collective under-registration of customer water meters. Many customer water meters gradually wear as large cumulative volumes of water are passed through them over time. This causes the meters to under-register the flow of water. This occurrence is common with smaller residential meters of sizes 5/8-inch and 3/4 inch after they have registered very large cumulative volumes of water, which generally occurs only after periods of years. For meters sized 1-inch and larger - typical of multi-unit residential, commercial and industrial accounts - meter under-registration can occur from wear or from the improper application of the meter; i.e. installing the wrong type of meter or the wrong size of meter, for the flow pattern (profile) of the consumer. For instance, many larger meters have reduced accuracy at low flows. If an oversized meter is installed, most of the time the routine flow will occur in the low flow range of the meter, and a significant portion of it may not be registered. It is important to properly select and install all meters, but particularly large customer meters, size 1-inch and larger. The auditor has two options for entering data for this component of the audit. The auditor can enter a percentage under-registration (typically an estimated value), this will apply the selected percentage to the two categories of metered consumption to determine the volume of water not recorded due to customer meter inaccuracy. Note that this percentage is a composite average inaccuracy for all customer meters in the entire meter population. The percentage will be multiplied by the sum of the volumes in the Billed Metered and Unbilled Metered components. Alternatively, if the auditor has substantial data from meter testing activities, he or she can calculate their own loss volumes, and this volume may be entered directly. Note that a value of zero will be accepted but an alert will appear asking if the customer population is unmetered. Since all metered systems have some degree of inaccuracy, a positive value should be entered. A value of zero in this component is valid only if the water utility does not meter its customer population.
Customer retail unit cost Find	The Customer Retail Unit Cost represents the charge that customers pay for water service. This unit cost is applied routinely to the components of Apparent Loss, since these losses represent water reaching customers but not (fully) paid for. Since most water utilities have a rate structure that includes a variety of different costs based upon class of customer, a weighted average of individual costs and number of customer accounts in each class can be calculated to determine a single composite cost that should be entered into this cell. Finally, the weighted average cost should also include additional charges for sewer, storm water or biosolids processing, but only if these charges are based upon the volume of potable water consumed. For water utilities in regions with limited water resources and a questionable ability to meet the drinking water demands in the future, the Customer Retail Unit Cost might also be applied to value the Real Losses; instead of applying the Variable Production Cost to Real Losses. In this way, it is assumed that every unit volume of leakage reduced by leakage management activities will be sold to a customer. Note: the Free Water Audit Software allows the user to select the units that are charged to customers (either $/1,000 gallons, $/hundred cubic feet, or $/1,000 litres) and automatically converts these units to the units that appear in the "WATER SUPPLIED" box. The monetary units are United States dollars, $.
Infrastructure Leakage Index (ILI) Find	The ratio of the Current Annual Real Losses (Real Losses) to the Unavoidable Annual Real Losses (UARL). The ILI is a highly effective performance indicator for comparing (benchmarking) the performance of utilities in operational management of real losses.
Length of mains Find	Length of all pipelines (except service connections) in the system starting from the point of system input metering (for example at the outlet of the treatment plant). It is also recommended to include in this measure the total length of fire hydrant lead pipe. Hydrant lead pipe is the pipe branching from the water main to the fire hydrant. Fire hydrant leads are typically of a sufficiently large size that is more representative of a pipeline than a service connection. The average length of hydrant leads across the entire system can be assumed if not known, and multiplied by the number of fire hydrants in the system, which can also be assumed if not known. This value can then be added to the total pipeline length. Total length of mains can therefore be calculated as: Length of Mains, miles = (total pipeline length, miles) + [{(average fire hydrant lead length, ft) x (number of fire hydrants)} / 5,280 ft/mile] or Length of Mains, kilometres = (total pipeline length, kilometres) + [{(average fire hydrant lead length, metres) x (number of fire hydrants)} / 1,000 metres/kilometre]
NON-REVENUE WATER Find	= Apparent Losses + Real Losses + Unbilled Metered Consumption + Unbilled Unmetered Consumption. This is water which does not provide revenue potential to the utility.
Number of active AND inactive service connections Find	Number of customer service connections, extending from the water main to supply water to a customer. Please note that this includes the actual number of distinct piping connections, including fire connections, whether active or inactive. This may differ substantially from the number of customers (or number of accounts). **Note: this number does not include the pipeline leads to fire hydrants - the total length of piping supplying fire hydrants should be included in the "Length of mains" parameter.**
Real Losses Find	Physical water losses from the pressurized system (water mains and customer service connections) and the utility's storage tanks, up to the point of customer consumption. In metered systems this is the customer meter, in unmetered situations this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows.
Revenue Water	Those components of System Input Volume that are billed and have the potential to produce revenue.
Service Connection Density Find	=number of customer service connections / length of mains

Item Name	Description
Systematic data handling errors Find	Apparent losses caused by accounting omissions, errant computer programming, gaps in policy, procedure, and permitting/activation of new accounts; and any type of data lapse that results in under-stated customer water consumption in summary billing reports. Systematic Data Handling Errors result in a direct loss of revenue potential. Water utilities can find "lost" revenue by keying on this component. Utilities typically measure water consumption registered by water meters at customer premises. The meter should be read routinely (ex: monthly) and the data transferred to the Customer Billing System, which generates and sends a bill to the customer. Data Transfer Errors result in the consumption value being less than the actual consumption, creating an apparent loss. Such error might occur from illegible and mis-recorded hand-written readings compiled by meter readers, inputting an incorrect meter register unit conversion factor in the automatic meter reading equipment, or a variety of similar errors. Apparent losses also occur from Data Analysis Errors in the archival and data reporting processes of the Customer Billing System. Inaccurate estimates used for accounts that fail to produce a meter reading are a common source of error. Billing adjustments may award customers a rightful monetary credit, but do so by creating a negative value of consumption, thus under-stating the actual consumption. Account activation lapses may allow new buildings to use water for months without meter readings and billing. Poor permitting and construction inspection practices can result in a new building lacking a billing account, a water meter and meter reading; i.e., the customer is unknown to the utility's billing system. Close auditing of the permitting, metering, meter reading, billing and reporting processes of the water consumption data trail can uncover data management gaps that create volumes of systematic data handling error. Utilities should routinely analyze customer billing records to detect data anomalies and quantify these losses. For example, a billing account that registers zero consumption for two or more billing cycles should be checked to explain why usage has seemingly halted. Given the revenue loss impacts of these losses, water utilities are well-justified in providing continuous oversight and timely correction of data transfer errors & data handling errors. If the water auditor has not yet gathered detailed data or assessment of systematic data handling error, it is recommended that the auditor apply the default value of 0.25% of the Billed Authorized Consumption volume. However, if the auditor has investigated the billing system and its controls, and has well validated data that indicates the volume from systematic data handling error is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations and select an appropriate grading. Note: negative values are not allowed for this audit component. If the auditor enters zero for this component then a grading of 1 will be automatically assigned.
Total annual cost of operating the water system Find	These costs include those for operations, maintenance and any annually incurred costs for long-term upkeep of the drinking water supply and distribution system. It should include the costs of day-to-day upkeep and long-term financing such as repayment of capital bonds for infrastructure expansion or improvement. Typical costs include employee salaries and benefits, materials, equipment, insurance, fees, administrative costs and all other costs that exist to sustain the drinking water supply. Depending upon water utility accounting procedures or regulatory agency requirements, it may be appropriate to include depreciation in the total of this cost. This cost should not include any costs to operate wastewater, biosolids or other systems outside of drinking water.
Unauthorized consumption Find	Includes water illegally withdrawn from fire hydrants, illegal connections, bypasses to customer consumption meters, or tampering with metering or meter reading equipment; as well as any other ways to receive water while thwarting the water utility's ability to collect revenue for the water. Unauthorized consumption results in uncaptured revenue and creates an error that understates customer consumption. In most water utilities this volume is low and, if the water auditor has not yet gathered detailed data for these loss occurrences, it is recommended that the auditor apply a default value of 0.25% of the volume of water supplied. However, if the auditor has investigated unauthorized occurrences, and has well validated data that indicates the volume from unauthorized consumption is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations. Note that a value of zero will not be accepted since all water utilities have some volume of unauthorized consumption occurring in their system. Note: if the auditor selects the default value for unauthorized consumption, a data grading of 5 is automatically assigned, but not displayed on the Reporting Worksheet.
Unavoidable Annual Real Losses (UARL) Find	UARL (gallons/day)=(5.41Lm + 0.15Nc + 7.5Lc) xP, or UARL (litres/day)=(18.0Lm + 0.8Nc + 25.0Lc) xP where: Lm = length of mains (miles or kilometres) Nc = number of customer service connections Lp = the average distance of customer service connection piping (feet or metres) (see the Worksheet "Service Connection Diagram" for guidance on deterring the value of Lp) Lc = total length of customer service connection piping (miles or km) Lc = Nc X Lp (miles or kilometres) P = Pressure (psi or metres) The UARL is a theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a key variable in the calculation of the Infrastructure Leakage Index (ILI). Striving to reduce system leakage to a level close to the UARL is usually not needed unless the water supply is unusually expensive, scarce or both. NOTE: The UARL calculation has not yet been proven as fully valid for very small, or low pressure water distribution systems. If, in gallons per day: (Lm x 32) + Nc < 3000 or P <35psi in litres per day: (Lm x 20) + Nc < 3000 or P < 25m then the calculated UARL value may not be valid. The software does not display a value of UARL or ILI if either of these conditions is true.

Item Name	Description
Unbilled Authorized Consumption	All consumption that is unbilled, but still authorized by the utility. This includes Unbilled Metered Consumption + Unbilled Unmetered Consumption. See "Authorized Consumption" for more information. For Unbilled Unmetered Consumption, the Free Water Audit Software provides the auditor the option to select a default value if they have not audited unmetered activities in detail. The default calculates a volume that is 1.25% of the Water Supplied volume. If the auditor has carefully audited the various unbilled, unmetered, authorized uses of water, and has established reliable estimates of this collective volume, then he or she may enter the volume directly for this component, and not use the default value.
Unbilled metered consumption Find	Metered consumption which is authorized by the water utility, but, for any reason, is deemed by utility policy to be unbilled. This might for example include metered water consumed by the utility itself in treatment or distribution operations, or metered water provided to civic institutions free of charge. **It does not include water supplied to neighboring utilities (water exported) which may be metered but not billed.**
Unbilled unmetered consumption Find	Any kind of Authorized Consumption which is neither billed or metered. This component typically includes water used in activities such as fire fighting, flushing of water mains and sewers, street cleaning, fire flow tests conducted by the water utility, etc. In most water utilities it is a small component which is very often substantially overestimated. **It does NOT include water supplied to neighboring utilities (water exported) which is unmetered and unbilled – an unlikely case.** This component has many sub-components of water use which are often tedious to identify and quantify. Because of this, and the fact that it is usually a small portion of the water supplied, it is recommended that the auditor apply the default value, which is 1.25% of the Water Supplied volume. Select the default percentage to enter this value. If the water utility has carefully audited the unbilled, unmetered activities occurring in the system, and has well validated data that gives a value substantially higher or lower than the default volume, then the auditor should enter their own volume. However the default approach is recommended for most water utilities. Note that a value of zero is not permitted, since all water utilities have some volume of water in this component occurring in their system.
Units and Conversions	The user may develop an audit based on one of three unit selections: 1) Million Gallons (US) 2) Megalitres (Thousand Cubic Metres) 3) Acre-feet Once this selection has been made in the instructions sheet, all calculations are made on the basis of the chosen units. Should the user wish to make additional conversions, a unit converter is provided below (use drop down menus to select units from the yellow unit boxes): Enter Units: 1 — Convert From… Million Gallons (US) = **Converts to…..** 3.06888329 Acre-feet (conversion factor = 3.06888328973723)
Use of Option Buttons	 **NOTE:** For Unbilled Unmetered Consumption, Unauthorized Consumption and Systematic Data Handling Errors, a recommended default value can be applied by selecting the Percent option. The default values are based on fixed percentages of Water Supplied or Billed Authorized Consumption and are recommended for use in this audit unless the auditor has well validated data for their system. Default values are shown by purple cells, as shown in the example above. If a default value is selected, the user does not need to grade the item; a grading value of 5 is automatically applied (however, this grade will not be displayed).
Variable production cost (applied to Real Losses) Find	The cost to produce and supply the next unit of water (e.g., $/million gallons). This cost is determined by calculating the summed unit costs for ground and surface water treatment and all power used for pumping from the source to the customer. It may also include other miscellaneous unit costs that apply to the production of drinking water. It should also include the unit cost of bulk water purchased as an import if applicable. It is common to apply this unit cost to the volume of Real Losses. However, if water resources are strained and the ability to meet future drinking water demands is in question, then the water auditor can be justified in applying the Customer Retail Rate to the Real Loss volume, rather than applying the Variable Production Cost. The Free Water Audit Software applies the Variable Production costs to Real Losses by default. However, the auditor has the option on the Reporting Worksheet to select the Customer Retail Cost as the basis for the Real Loss cost evaluation if the auditor determines that this is warranted.
Volume from own sources Find	The volume of water withdrawn (abstracted) from water resources (rivers, lakes, streams, wells, etc) controlled by the water utility, and then treated for potable water distribution. Most water audits are compiled for utility retail water distribution systems, so this volume should reflect the amount of treated drinking water that entered the distribution system. Often the volume of water measured at the effluent of the treatment works is slightly less than the volume measured at the raw water source, since some of the water is used in the treatment process. Thus, it is useful if flows are metered at the effluent of the treatment works. If metering exists only at the raw water source, an adjustment for water used in the treatment process should be included to account for water consumed in treatment operations such as filter backwashing, basin flushing and cleaning, etc. If the audit is conducted for a wholesale water agency that sells untreated water, then this quantity reflects the measure of the raw water, typically metered at the source.

Item Name	Description
Volume from own sources: Master meter and supply error adjustment Find	An estimate or measure of the degree of inaccuracy that exists in the master (production) meters measuring the annual Volume from own Sources, and any error in the data trail that exists to collect, store and report the summary production data. This adjustment is a weighted average number that represents the collective error for all master meters for all days of the audit year and any errors identified in the data trail. Meter error can occur in different ways. A meter or meters may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Data error can occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of inaccuracy in master meters and data errors in archival systems are common; thus a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration.
Water exported Find	The Water Exported volume is the bulk water conveyed and sold by the water utility to neighboring water systems that exists outside of their service area. Typically this water is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water utility that is selling the water: i.e. the exporter. If the water utility who is compiling the annual water audit sells bulk water in this manner, they are an exporter of water. Note: The Water Exported volume is sold to wholesale customers who are typically charged a wholesale rate that is different than retail rates charged to the retail customers existing within the service area. Many state regulatory agencies require that the Water Exported volume be reported to them as a quantity separate and distinct from the retail customer billed consumption. For these reasons - and others - the Water Exported volume is always quantified separately from Billed Authorized Consumption in the standard water audit. **Be certain not to "double-count" this quantity by including it in both the Water Exported box and the Billed Metered Consumption box of the water audit Reporting Worksheet. This volume should be included only in the Water Exported box.**
Water exported: Master meter and supply error adjustment Find	An estimate or measure of the volume in which the Water Exported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived exported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of error in their metered data, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived data. Thus, a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment. Corrections to data gaps or other errors found in the archived data should also be included as a portion of this meter error adjustment.
Water imported Find	The Water Imported volume is the bulk water purchased to become part of the Water Supplied volume. Typically this is water purchased from a neighboring water utility or regional water authority, and is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water supplier selling the water to the utility conducting the water audit. The water supplier selling the bulk water usually charges the receiving utility based upon a wholesale water rate.
Water imported: Master meter and supply error adjustment Find	An estimate or measure of the volume in which the Water Imported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived imported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some level of meter inaccuracy, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived metered data. Thus, a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment.
WATER LOSSES Find	= apparent losses + real losses Water Losses are the difference between Water Supplied and Authorized Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission systems, pressure zones or district metered areas (DMA); if one of these configurations are the basis of the water audit.

AWWA Free Water Audit Software:
Determining Water Loss Standing

WAS v5.0

Water Audit Report for: Vallecitos Water District (3710002)
Reporting Year: 2016 | 1/2016 - 12/2016
Data Validity Score: 70

Water Loss Control Planning Guide

	Water Audit Data Validity Level / Score				
Functional Focus Area	**Level I** (0-25)	**Level II** (26-50)	**Level III** (51-70)	**Level IV** (71-90)	**Level V** (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities is gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

Note: this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

General Guidelines for Setting a Target ILI (without doing a full economic analysis of leakage control options)

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
1.0 - 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 -5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term
>5.0 - 8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
Less than 1.0	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		

Example 1a: Million Gallons: | **Example 1b**: Million Gallons: | **Example 2a**: Megalitres: | **Example 2b**: Megalitres:

Example Audit 1a:

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Asheville (01-11-010)
Reporting Year: 2013 7/2012 - 6/2013

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

		<---------- Enter grading in column 'E' and 'J' ---------->			Master Meter Error Adjustments	
WATER SUPPLIED					Pcnt:	Value:
Volume from own sources:	7	7,352.880	MG/Yr	3		285.450 MG/Yr
Water imported:	n/a	0.000	MG/Yr			MG/Yr
Water exported:	n/a	0.000	MG/Yr			MG/Yr
WATER SUPPLIED:		**7,067.430**	MG/Yr		Enter negative % or value for under-registration Enter positive % or value for over-registration	
AUTHORIZED CONSUMPTION					Click here: ? for help using option buttons below	
Billed metered:	8	4,782.250	MG/Yr			
Billed unmetered:	n/a	0.000	MG/Yr			
Unbilled metered:	7	27.757	MG/Yr		Pcnt:	Value:
Unbilled unmetered:	8	157.790	MG/Yr			157.790 MG/Yr
Unbilled Unmetered volume entered is greater than the recommended default value					Use buttons to select percentage of water supplied OR value	
AUTHORIZED CONSUMPTION:		**4,967.797**	MG/Yr			
WATER LOSSES (Water Supplied - Authorized Consumption)		**2,099.633**	MG/Yr			
Apparent Losses					Pcnt:	Value:
Unauthorized consumption:		17.669	MG/Yr		0.25%	MG/Yr
Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed						
Customer metering inaccuracies:	7	111.220	MG/Yr		2.26%	MG/Yr
Systematic data handling errors:	5	11.956	MG/Yr		0.25%	MG/Yr
Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed						
Apparent Losses:		**140.844**	MG/Yr			
Real Losses (Current Annual Real Losses or CARL)						
Real Losses = Water Losses - Apparent Losses:		**1,958.789**	MG/Yr			
WATER LOSSES:		**2,099.633**	MG/Yr			
NON-REVENUE WATER						
NON-REVENUE WATER:		**2,285.180**	MG/Yr			
= Water Losses + Unbilled Metered + Unbilled Unmetered						
SYSTEM DATA						
Length of mains:	4	1,236.5	miles			
Number of active AND inactive service connections:	7	55,256				
Service connection density:		45	conn./mile main			
Are customer meters typically located at the curbstop or property line?		Yes				
Average length of customer service line:					(length of service line, beyond the property boundary, that is the responsibility of the utility)	
Average length of customer service line has been set to zero and a data grading score of 10 has been applied						
Average operating pressure:	4	145.3	psi			
COST DATA						
Total annual cost of operating water system:	10	$33,630,676	$/Year			
Customer retail unit cost (applied to Apparent Losses):	10	$3.22	$/100 cubic feet (ccf)			
Variable production cost (applied to Real Losses):	6	$335.94	$/Million gallons		☐ Use Customer Retail Unit Cost to value real losses	

WATER AUDIT DATA VALIDITY SCORE:

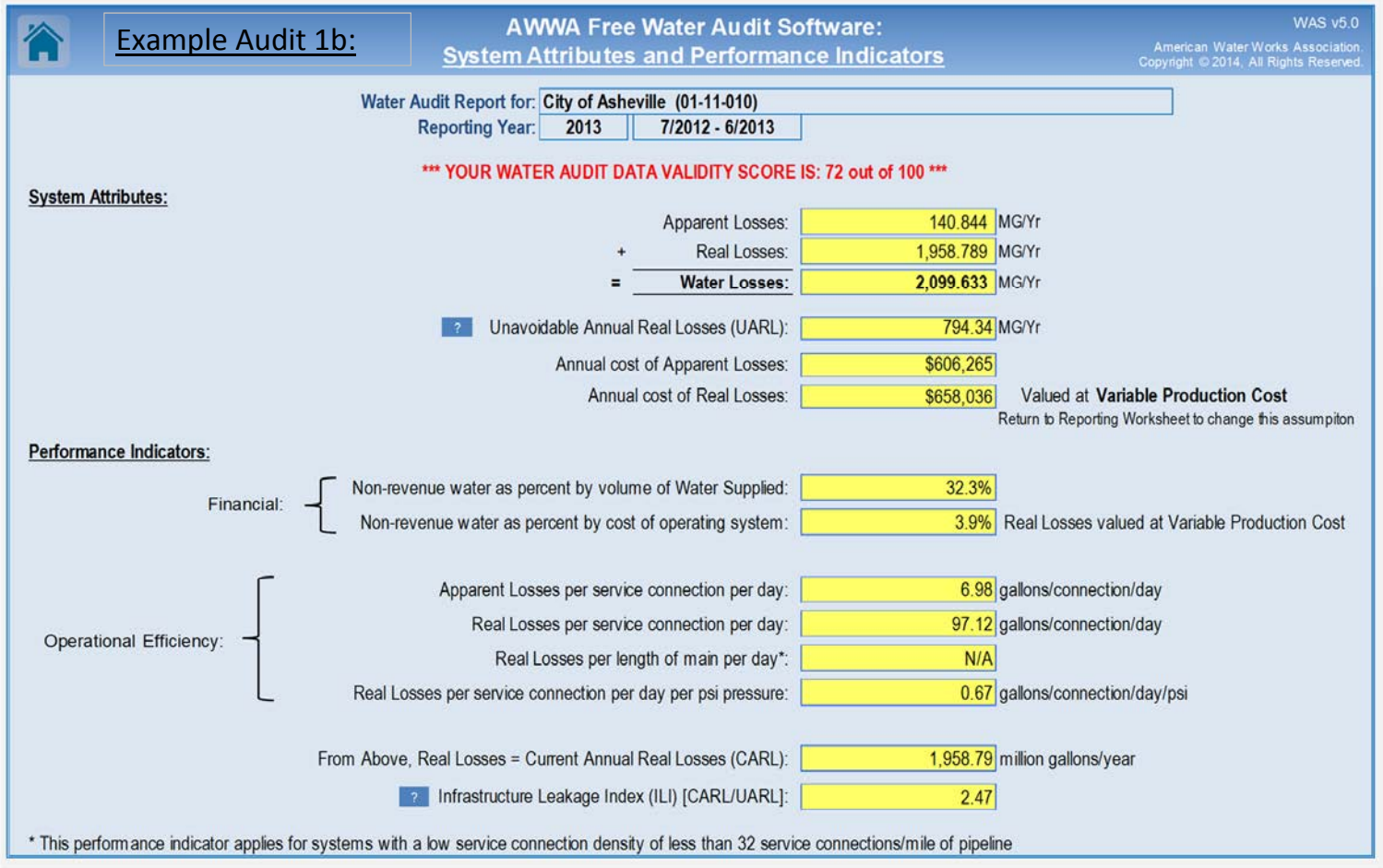
***** YOUR SCORE IS: 72 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Variable production cost (applied to Real Losses)
3: Unauthorized consumption



Example Audit 1b:

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

Water Audit Report for: City of Asheville (01-11-010)
Reporting Year: 2013 7/2012 - 6/2013

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 72 out of 100 ***

System Attributes:

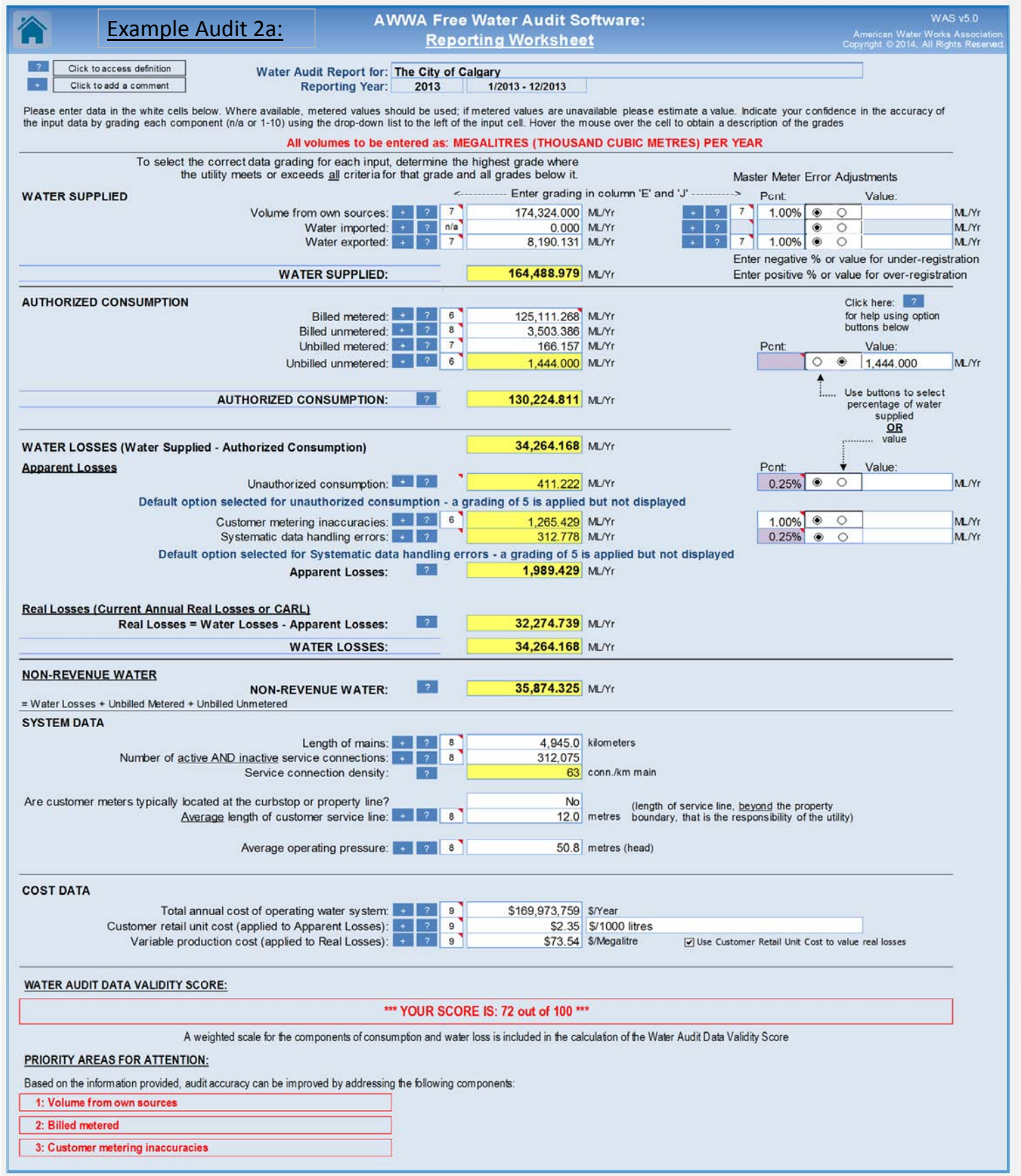
	Apparent Losses:	140.844	MG/Yr
+	Real Losses:	1,958.789	MG/Yr
=	**Water Losses:**	**2,099.633**	MG/Yr
?	Unavoidable Annual Real Losses (UARL):	794.34	MG/Yr
	Annual cost of Apparent Losses:	$606,265	
	Annual cost of Real Losses:	$658,036	Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	32.3%	
	Non-revenue water as percent by cost of operating system:	3.9%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	6.98	gallons/connection/day
	Real Losses per service connection per day:	97.12	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.67	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	1,958.79	million gallons/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.47	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



Example Audit 2a:

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
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Click to access definition
Click to add a comment

Water Audit Report for: The City of Calgary
Reporting Year: 2013 1/2013 - 12/2013

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MEGALITRES (THOUSAND CUBIC METRES) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Enter grading in column 'E' and 'J'

Master Meter Error Adjustments

WATER SUPPLIED

					Pcnt:	Value:	
Volume from own sources:	7	174,324.000	ML/Yr	7	1.00%		ML/Yr
Water imported:	n/a	0.000	ML/Yr				ML/Yr
Water exported:	7	8,190.131	ML/Yr	7	1.00%		ML/Yr
WATER SUPPLIED:		**164,488.979**	ML/Yr				

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: for help using option buttons below

				Pcnt:	Value:	
Billed metered:	6	125,111.268	ML/Yr			
Billed unmetered:	8	3,503.386	ML/Yr			
Unbilled metered:	7	166.157	ML/Yr			
Unbilled unmetered:	6	1,444.000	ML/Yr		1,444.000	ML/Yr
AUTHORIZED CONSUMPTION:		**130,224.811**	ML/Yr			

Use buttons to select percentage of water supplied OR value

WATER LOSSES (Water Supplied - Authorized Consumption) **34,264.168** ML/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		411.222	ML/Yr	0.25%		ML/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	6	1,265.429	ML/Yr	1.00%		ML/Yr
Systematic data handling errors:		312.778	ML/Yr	0.25%		ML/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **1,989.429** ML/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **32,274.739** ML/Yr

WATER LOSSES: **34,264.168** ML/Yr

NON-REVENUE WATER

NON-REVENUE WATER: **35,874.325** ML/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	4,945.0	kilometers
Number of active AND inactive service connections:	8	312,075	
Service connection density:		63	conn./km main
Are customer meters typically located at the curbstop or property line?		No	
Average length of customer service line:	8	12.0	metres (length of service line, beyond the property boundary, that is the responsibility of the utility)
Average operating pressure:	8	50.8	metres (head)

COST DATA

Total annual cost of operating water system:	9	$169,973,759	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$2.35	$/1000 litres	
Variable production cost (applied to Real Losses):	9	$73.54	$/Megalitre	☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

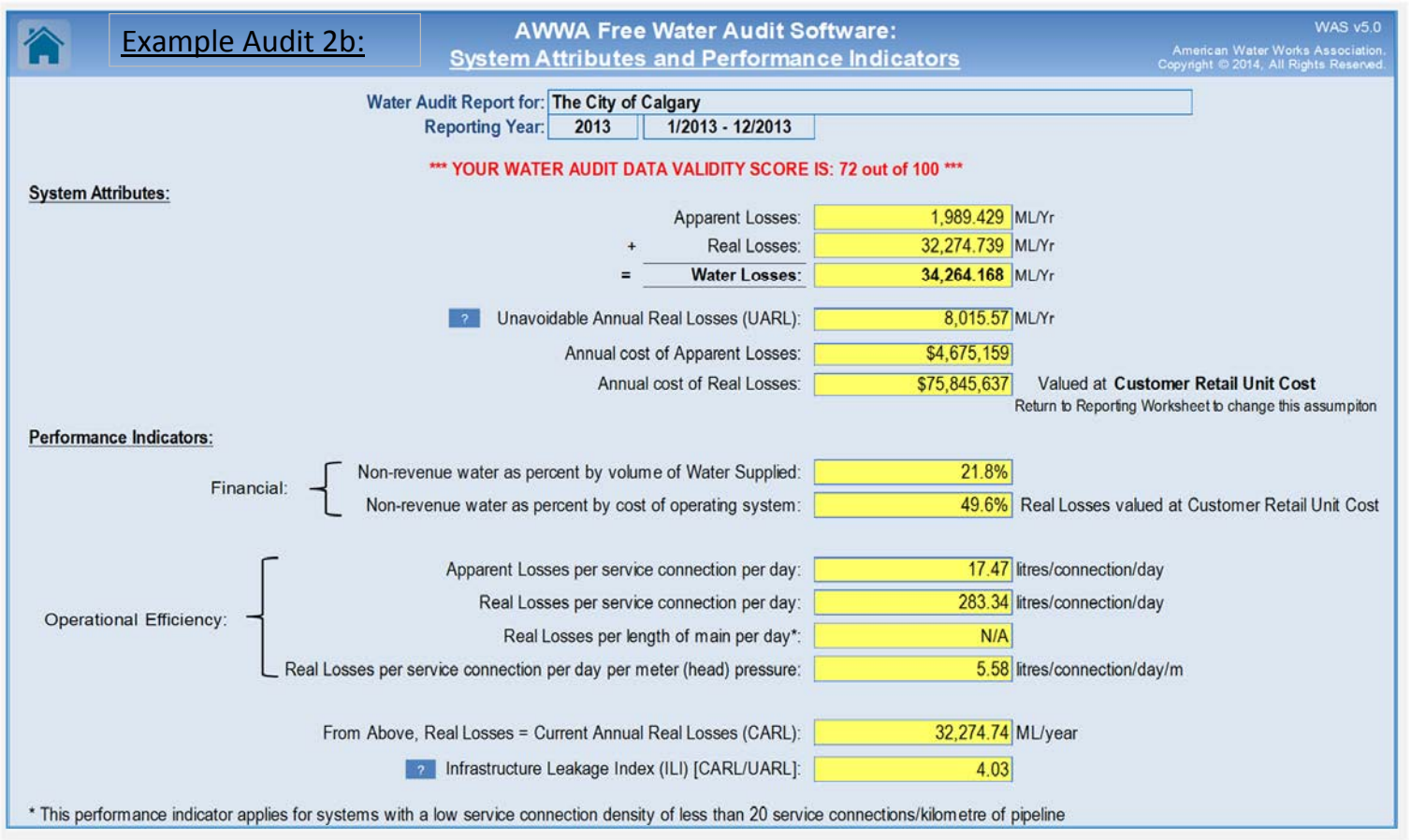
*** YOUR SCORE IS: 72 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed metered
3: Customer metering inaccuracies



Example Audit 2b:

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

Water Audit Report for: The City of Calgary
Reporting Year: 2013 1/2013 - 12/2013

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 72 out of 100 ***

System Attributes:

	Apparent Losses:	1,989.429	ML/Yr
+	Real Losses:	32,274.739	ML/Yr
=	**Water Losses:**	**34,264.168**	ML/Yr
?	Unavoidable Annual Real Losses (UARL):	8,015.57	ML/Yr
	Annual cost of Apparent Losses:	$4,675,159	
	Annual cost of Real Losses:	$75,845,637	Valued at **Customer Retail Unit Cost**

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	21.8%	
	Non-revenue water as percent by cost of operating system:	49.6%	Real Losses valued at Customer Retail Unit Cost
Operational Efficiency:	Apparent Losses per service connection per day:	17.47	litres/connection/day
	Real Losses per service connection per day:	283.34	litres/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per meter (head) pressure:	5.58	litres/connection/day/m
	From Above, Real Losses = Current Annual Real Losses (CARL):	32,274.74	ML/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	4.03	

* This performance indicator applies for systems with a low service connection density of less than 20 service connections/kilometre of pipeline

AWWA Water Audit Software Version 5.0 Developed by the Water Loss Control Committee of the American Water Works Association August, 2014

This software is intended to serve as a basic tool to compile a preliminary, or "top-down", water audit. It is recommended that users also refer to the current edition of the AWWA M36 Publication, Water Audits and Loss Control Programs, for detailed guidance on compiling a comprehensive, or "bottom-up", water audit using the same water audit methodology.

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- Kunkel, G. et al, 2003. Water Loss Control Committee Report: Applying Worldwide Best Management Practices in Water Loss Control. Journal AWWA, 95:8:65

- AWWA Water Audits and Loss Control Programs, M36 Publication, 3rd Edition, 2009

- Service Connection Diagrams courtesy of Ronnie McKenzie, WRP Pty Ltd.

VERSION HISTORY:

Version:	Release Date:	Number of Worksheets:	Key Features and Developments
v1	2005/ 2006	5	The AWWA Water Audit Software was piloted in 2005 (v1.0 beta). The early versions (1.x) of the software restricted data entry to units of Million Gallons per year. For each entry into the audit, users identified whether the input was measured or estimated.
v2	2006	5	The most significant enhancement in v2 of the software was to allow the user to choose the volumetric units to be used in the audit, Million Gallons or Thousand Cubic Metres (megalitres) per year. Two financial performance indicators were added to provide feedback to the user on the cost of Real and Apparent losses.
v3	2007	7	In v3, the option to report volumetric units in acre-feet was added. Another new feature in v3 was the inclusion of default values for two water audit components (unbilled unmetered and unauthorized consumption). v3 also included two examples of completed audits in units of million gallons and Megalitres. Several checks were added into v3 to provide instant feedback to the user on common data entry problems, in order to help the user complete an accurate water audit.
v4 - v4.2	2010	10	v4 (and versions 4.x) of the software included a new approach to data grading. The simple "estimated" or "measured" approach was replaced with a more granular scale (typically 1-10) that reflected descriptions of utility practices and served to describe the confidence and accuracy of the input data. Each input value had a corresponding scale fully described in the Grading Matrix tab. The Grading Matrix also showed the actions required to move to a higher grading score. Grading descriptions were available on the Reporting Worksheet via a pop-up box next to each water audit input. A water audit data validity score is generated (max = 100) and priority areas for attention (to improve audit accuracy) are identified, once a user completes the requied data grading. A service connection diagram was also added to help users understand the impact of customer service line configurations on water losses and how this information should be entered into the water audit software. An acknoweldgements section was also added. Minor bug fixes resulted in the release of versions 4.1 and 4.2. A French language version was also made available for v4.2.
v5	2014	12	In v5, changes were made to the way Water Supplied information is entered into software, with each major component having a corresponding Master Meter Error Adjustment entry (and data grading requirement). This required changes to the data validity score calculation; v5 of the software uses a weighting system that is, in part, proportional to the volume of input components. The Grading Matrix was updated to reflect the new audit inputs and also to include clarifications and additions to the scale descriptions. The appearance of the software was updated in v5 to make the software more user-friendly and several new features were added to provide more feedback to the user. Notably, a dashboard tab has been added to provide more visual feedback on the water audit results and associated costs of Non-Revenue Water. A comments sheet was added to allow the user to track notes, comments and to cite sources used.

DATE: **OCTOBER 18, 2017**
TO: **BOARD OF DIRECTORS**
SUBJECT: **LEGAL SERVICES SOLICITATION**

BACKGROUND:

The Vallecitos Water District receives general counsel services from the firm of Scott Jackson Law. Their attorney acting as primary counsel for the District, Jeff Scott, has represented the District's legal interests for over twenty years.

Resolution No. 1484 establishes the purchasing policies and procedures for the District. Section 1.10 of Resolution No. 1484 states "Vendors supplying annual services or materials in an amount of $100,000 or greater in any one fiscal year are required to provide a bid for similar services or materials no less than once every five subsequent fiscal years." It has been well over five years since the District solicited competitive bids/proposals for its legal services

DISCUSSION:

On Friday, September 29, 2017, the District released a Request for Proposals (RFP) seeking law firms interested in providing general counsel services to the District. The RFP was sent to a select group of law firms that was developed based on their industry reputations and the clients they serve. The deadline for firms to submit a proposal is Friday, October 27, 2017.

Within the RFP, the process for the selection of the firm is generally discussed, stating "Proposals will be screened by an internal review committee that may include up to two Board members." Before the October 27 submittal date, it would be advisable for the District to establish the procedure to be used to select the firm that will provide the District's general counsel services.

Typically, when reviewing proposals for services such as this, it is common to have a two-step process. The first step would be to perform an initial screening, wherein the proposals are evaluated by a screening committee against a pre-determined set of criteria and scoring. The screening committee ranks the submittals, determines how many/which of the proposing firms to move forward in the process and then makes a recommendation to the final selection committee. The firms selected to move forward would then be interviewed by the final selection committee for the ultimate selection.

In this situation, it would be advisable that the final selection committee consist of the entire Vallecitos Board of Directors. It would also be advisable that the General Manager be a part of that final selection process.

The screening committee could be comprised in a number of ways. In order to get the benefits of multiple perspectives, it would be advisable to have the screening committee consist of members of staff as well as members of the Board.

It is recommended that the Board representation on the screening committee consist of two Board members. The selection of the two Board members would be up to the Board and the following options are provided for the Board's consideration:

Screening Committee Board Composition Options:

- Option 1 – utilize the existing Legal/Legislative Affairs Committee. This Committee is currently comprised of Directors Martin and Sannella
- Option 2 – utilize the existing Public Awareness/Personnel/Policy Committee. This Committee is currently comprised of Directors Evans and Hernandez
- Option 3 – form a new committee for the specific purpose of screening the proposals and making recommendations to the full Board. The committee could include two Board members, possibly one member from the Legal/Legislative Committee and one member from the Public Awareness/Personnel/Policy Committee. Alternatively, at the Board's discretion, this single purpose committee could be made up of any two Board members
- Option 4 – do not include any Board members on the screening committee.

Neither of the two existing committees were specifically intended for this purpose, and an argument could be made for the assignment to be made to either committee. The Legal/Legislative Affairs Committee is primarily intended to deal with legal issues, such as lawsuits, and legislative issues facing the District, but the provision of legal services could certainly be construed to fall within the purview of that Committee. The Public Awareness/Personnel/Policy Committee could also be a logical choice for two reasons: the General Counsel acts as an extension of staff (personnel) and the impetus for the legal services solicitation is compliance with the District's purchasing policy (policy).

The staff members assigned to the screening committee would be at the discretion of the General Manager, and would consist of management employees that regularly interact with the General Counsel.

Regardless of the makeup of the screening committee, its task would be to evaluate the proposals and make recommendations to the full Board as to which firms should be considered during the final selection process.

FISCAL IMPACT:
The requested action does not have any fiscal impacts. The fiscal impact of the legal services firm that is ultimately retained will depend upon that firm's proposal, the scope of services and the results of the negotiations leading to an executed agreement.

RECOMMENDATION:
It is recommended that the Board provide staff direction regarding the makeup of the screening committee.

ATTACHMENT:
Legal Services Request for Proposal

VALLECITOS WATER DISTRICT

Water and Wastewater Specialists since 1955

REQUEST FOR PROPOSAL

PROFESSIONAL SERVICES

FOR

DISTRICT LEGAL COUNSEL

September 2017

REQUEST FOR PROPOSAL TO PROVIDE DISTRICT LEGAL SERVICES

Introduction

The Vallecitos Water District Board of Directors is seeking to contract with a legal firm to serve as General Legal Counsel for the District. The District invites interested law firms with a minimum of seven (7) years of public law experience representing Special Districts, Water Agencies, Sanitation Agencies or other local governments to submit a written proposal to provide general legal services.

As District General Legal Counsel (Legal Counsel), the selected law firm will be expected to provide a broad range of general legal services to Vallecitos Water District (VWD and/or the District). VWD's Legal Counsel is selected to work as an independent contractor by the Board of Directors and works closely with the General Manager and other staff. The Legal Counsel's primary role is to provide expert legal advice to the District's Board of Directors and General Manager. The selected firm will perform the tasks as specified below.

Background

VWD is a public agency providing water, recycled water and wastewater services. Organized in 1955, VWD currently serves a population of approximately 103,000 over 45 square miles in northern San Diego County and is currently one of only 33 Districts of Distinction statewide.

VWD's Board of Directors consists of five members, each elected by seat for four year overlapping terms. The Board has working committees (Engineering, Finance, Legal/Legislative, and Public Awareness/Personnel) that meet as needed.

The General Manager, who is appointed by the Board of Directors, is responsible for day-to-day operations and the implementation of policies approved by the Board. VWD currently employs 108 full time personnel as well as part-time employees and interns as appropriate. Its 2017/2018 operating budget is $53 million dollars and its capital budget is $122 million dollars. VWD's fiscal year runs from July 1 of the current year through June 30 of the following year.

Staff has been directed by the Board to solicit proposals from legal firms with the interest and capability to provide a wide breadth and depth of legal resources to the District.

Services to be Provided Regularly

- Advice to the Board of Directors and District management staff on matters of law including the Brown Act, Government Code, Water Code, Revenue and Taxation Code, conflict of interest issues, the Political Reform Act, Public Records Act, and parliamentary procedures for running meetings.
- Seek advice from regulatory agencies such as the Fair Political Practices Commission as requested by the Board or management staff.

- Attend all Board meetings unless excused by the President or the General Manager.
- Attend Closed Session meetings of the Board unless excused by the President or the General Manager
- Attend other meetings, such as workshops, Committee meetings, etc., as requested by the Board of Directors, General Manager, or other designee.
- Provide regular legal updates on current general topics of interest.
- Advice to the Board of Directors and District management staff on commencement or defense of litigation to protect VWD's interests and litigation of such issues as directed.
- Prepare and/or review ordinances, resolutions, and board packets as well as contracts, joint powers agreements, and other agreements and contracts entered into by VWD as requested by the General Manager.
- Provide written updates on new State and Federal legislation and judicial decisions impacting VWD, evaluate the potential impacts to the District and suggest action or changes in operations or procedures to ensure compliance.
- Promptly return all calls and emails from the Board of Directors and VWD staff.

Services to be Provided on an As Needed Basis at the General Manager's Request

- Provide legal assistance and consultation to General Manager or designee as requested on matters of environmental compliance, including CEQA, NEPA, ESA, etc. as they pertain to actions being contemplated by the District.
- Provide legal assistance and consultation to General Manager or designee as requested on matters of property rights and property management, including trespass, encroachment, lessee obligations, easements, and access.
- Review contracts, bid specifications, and purchasing documents for the purposes of legal and policy compliance, appropriate risk transfer, and risk analysis and avoidance.
- Consult with the General Manager on personnel matters, labor relations matters, litigation, and other matters concerning District business as requested (in matters that may not otherwise be covered by District agreements with other legal resources).
- Research and submit written legal opinions on special district or other legal matters concerning District business and/or as requested by the Board of Directors or General Manager.
- Enforce District ordinances and regulations through administrative and judicial actions as requested by the General Manager.
- Provide consultation and prepare legal notices at the direction of the General Manager or Executive Secretary.
- Prepare and review agreements and contracts with developers to ensure District's interests are protected.
- Review and comment on Water Supply Assessments and Verifications as needed related to land development activities.

Firms are hereby invited to submit a proposal based upon the requirements and conditions set forth in the RFP.

Mailing Instructions
Vallecitos Water District
Attn: General Manager
201 Vallecitos de Oro
San Marcos, CA 92069

Inquiries (clarifications only)
Glenn Pruim, General Manager, Vallecitos Water District, 760-744-0460 or gpruim@vwd.org

Submittal Date
Five copies of the proposal are due to Diane Posvar, Executive Secretary, by Friday, October 27, 2017.

Proposals should provide a straightforward and concise presentation adequate to satisfy the requirements of the RFP. Emphasis should be on completeness and clarity of contents. VWD reserves the right, without qualification, to:

- Select any proposal based on written or oral communication with any or all of the firms when such action is considered to be in the best interest of the District.
- Reject all proposals.
- Exercise discretion and apply its judgment with respect to any proposals submitted.

All proposals will be deemed confidential to the extent allowed by open meeting and public records laws, and will be retained by VWD.

Proposal Content and Requested Information
VWD requires the applicant to submit a concise proposal, clearly addressing all of the requirements outlined in this RFP in the following sections A-D. To be considered responsive, the proposal must provide specific answers to all questions and requests for information. The proposal narrative with exhibits and attachments, not including resumes/curriculum vitae, shall not exceed fifteen pages in length. Information provided beyond the fifteen-page limit will not be evaluated.

A. Experience and Qualifications

1. Describe the nature of your law firm's practice and your qualifications for providing general legal services for VWD.

2. Provide the areas of expertise contained within your firm. Describe how legal services will be provided for those areas of the law outside your firm's expertise.

3. Provide written references from at least three California public agencies, preferably water or wastewater districts, which have utilized your services, including addresses and phone numbers of elected officials or key public agency staff who are familiar with your performance during the number of years served.

4. The individual designated as primary legal counsel shall have a minimum of 10 years of direct practice as a District Legal Counsel with experience in both water and wastewater. For the person whom you propose to designate as primary legal counsel, and for each person you propose to designate as backup attorney and/or supporting counsel for ongoing or special legal services to the Vallecitos Water District, please provide the following:

    a. Professional chronology via a current resume or curriculum vitae.
    b. Legal training and years of practice (including date of admission to the California Bar).
    c. Years of municipal (general law or charter city) or other local public sector law practice as a full-time local government attorney and/or in a private law office specializing in the representation of special districts or general law cities.
    d. Knowledge of, and experience with, California special districts, Water Law or other public sector experience.
    e. Types of clientele represented and years representing each.
    f. Litigation experience and demonstration of a good court track record. Cite examples of public agency litigation experience.
    g. Length of employment with the proposing firm.
    h. Other notable qualifications that would enable your primary and his/her supporting counsel to fulfill this role.

5. Demonstrated legal expertise in the following areas as it relates to special districts or municipal governments:

    a. Laws and regulations governing California special districts and operating procedures relative to the conduct of special district business.
    b. Experience and knowledge of Public Contracting Code, Labor Code, and other California statutes governing the bidding, awarding, contracting, and construction of public works and improvements.
    c. Environmental law, including the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).
    d. Contracts, joint powers authorities, memorandums of understanding, including risk transfer provisions.
    e. Preparation and review of ordinances and resolutions as requested.
    f. Real estate law, easements, rights-of-way, and other related agreements and negotiations.

g. California Public Records Act, the Ralph M. Brown Act, Fair Political Practices Commission regulations and public official conflict statutes, and the California Elections Code.
h. Formation of assessment and improvement districts.
i. Laws pertaining to fees and taxes, including Propositions 218 and 26.
j. Other relevant areas pertaining to special district/water agency or municipal law.

6. Intended office location and accessibility to the District.

7. Scholastic honors and professional affiliations.

8. If the firm/individual, or any of the attorneys employed by the firm, have ever been sued by special districts, local governments or other clients for malpractice and/or been the subject of complaints filed with the State Bar or had discipline imposed by the State Bar, please provide information on the nature of the incident, the date(s) when the matter began and concluded, and the results of the situation.

9. Other "value-added" qualifications or services, if any, which have not been listed in this RFP that you feel VWD should consider when making its selection. Such services would include those which could be made available to the District Board of Directors or General Manager at no cost or at a significantly reduced cost (e.g., a library of existing opinion letters that might apply to the needs of the District; a firm-sponsored, client-only research webpage; and/or the opportunity to attend firm-sponsored or firm-provided training on topics such as sexual harassment prevention).

B. Performance

1. Describe your view of the role of a special district's general legal counsel.
2. Describe how you would establish, develop, and maintain an effective working relationship with the Board of Directors, General Manager, department heads, and other agencies.
3. How would you describe your style of participation in Board meetings and workshops?
4. Describe how you will keep VWD informed about the status of litigation and other legal matters.
5. How do you evaluate the costs/benefits of litigating or settling cases?
6. How would you evaluate whether to use an attorney within your law firm or an attorney from another firm to handle a case, provide expert advice, or provide other needed services?
7. The District is a member of the Association of California Water Agencies Joint Powers Insurance Authority (ACWA/JPIA), which provides risk-sharing pools for property, liability, worker's compensation, and employee benefits coverage. The JPIA handles

covered claims and would provide legal representation for the District on matters related to the coverage programs. Explain what role you envision your firm taking in legal issues involving ACWA/JPIA participation.

8. Describe your view of the role of a district's legal counsel with the public and the media.
9. Define the standard time frames for response by the primary legal counsel to direction and/or inquiry from the Board of Directors or General Manager and District staff.
10. Describe how you would review the legal background and issues currently facing the District.
11. Describe the staffing of your office and include any staffing changes you would propose for your firm should you be awarded the contract to provide legal services for the District.
12. Describe the computer resources currently utilized within your office. (VWD presently utilizes the Microsoft Office suite of software; therefore, compatibility with Microsoft Word and Excel is required. VWD will also require the firm to maintain internet services such that mail and files can be transmitted between staff and the legal counsel electronically.)
13. Describe the systems or mechanisms that would be established for monthly reporting of the status of projects, requests, and litigation.
14. Describe how you track and manage legal costs so that the District's legal costs are held to a minimum.

C. Current Clients/Conflict of Interest

1. List all current or former clients (including pro bono) with real property ownership, residence, or principal place of business within the boundaries of the District within the past three years.
2. List all public clients for which you or your firm currently provide services under a fee for services basis or on a retainer basis.
3. Identify any foreseeable or potential conflicts of interest which would result from such representation and the manner in which you would propose to resolve such conflicts.

D. Compensation, Reimbursement, Risk Transfer

1. Describe how your firm proposes to be compensated for its services, i.e., on the basis of a retainer and/or time and expenses schedule.
2. If a retainer-based compensation schedule is preferred by VWD's Board of Directors, please provide the retainer fee your firm would charge and the list of services included therein. Please use the list on page 3 to describe those services that would be included within the retainer.
3. If a time and expense compensation schedule is proposed by your firm, please indicate the hourly rate VWD would be billed by attorney and/or type of service.

4. If the VWD Board of Directors wishes to consider a combination of a retainer and time and expense based compensation, please provide as detailed an explanation as possible of your proposed retainer fee, time and expense billing methodology, and the services included under each compensation type, using the list on page 3 as a reference.
5. Provide the hourly billing cost that would be charged to VWD for special projects/contracted work requested by the General Manager per question #4 above.
6. Describe how your firm would bill for legal services provided by another legal firm under your direction/supervision. Explain if your firm would include a surcharge/markup on the charges from the outside firm.
7. Provide the limits of your professional liability insurance coverage. The District will require risk transfer provisions in its contract with the selected firm.

Evaluation and Selection Process

All proposals must be received by the District's Executive Secretary by Friday, October 27, 2017.

Proposals will be screened by an internal review committee that may include up to two Board members. Qualifications for top candidates will be verified and candidates will be checked by the General Manager or his designee. The top candidates will be submitted to the full Board and interviews will be scheduled.

In reviewing the proposals, the District will carefully weigh:

a. Depth and breadth of experience and expertise in the practice of law, most specifically in those areas most often encountered in special district/water agency operations;
b. Capability to perform legal services promptly and in a manner that permits the District and staff to meet established deadlines and to operate in an effective and efficient manner;
c. Degree of availability for quick response to inquiries that arise out of day-to-day operating questions or problems;
d. Degree to which firm and individual attorneys stay current through continued professional development and active communication with practitioners in special district/water agency law;
e. Communication skills;
f. Cost of services; and
g. Other qualifications/criteria as deemed appropriate by VWD's staff and Board of Directors.

The VWD General Manager will negotiate a final contract. As a final step, the Board of Directors will formally approve the contract and appoint the next legal counsel for the Vallecitos Water District on December 20, 2017. Work is anticipated to begin on or after January 1, 2018. These last two dates are the District's best schedule estimates and are subject to change.

DATE: **OCTOBER 18, 2017**
TO: **BOARD OF DIRECTORS**
SUBJECT: **ACWA ELECTION OF OFFICERS**

DISCUSSION:

ACWA will be holding a General Session Membership Meeting at their 2017 Fall Conference on Wednesday, November 29. The purpose of the meeting is to formally nominate and elect ACWA's President and Vice President for the 2018-2019 term and to conduct a vote by the membership on proposed amendments to the ACWA's Bylaws as recommended by the Board of Directors at its meetings on September 29, 2017.

The ACWA Nominating Committee has announced a 2018-2019 slate that recommends current Vice President Brent Hastey for President and current Federal Affairs Committee Chair Steven LaMar for Vice President. As provided by ACWA's Bylaws, nominations from the floor will be accepted prior to the vote and must be supported by a resolution of the governing body of the member making and seconding such nomination.

As part of the ongoing efforts to ensure ACWA's Bylaws are current and reflect consistency with other governance documents and daily operations, the Board of Directors is recommending several amendments to the Bylaws for consideration by the membership. A Legal Affairs Committee Workgroup reviewed the proposed amendments and provided an analysis pursuant to ACWA's Bylaws. Following is a list of the proposed amendments to the Bylaws. A list of the proposed amendments to the Bylaws along with the rational for the change and the Legal Affairs Committee Workgroup's analysis is attached.

The Board of Directors recommends adoption of the proposed amendments to the Association's Bylaws through a vote of the membership.

ACWA will issue one proxy card for voting purposes to each member agency present based on the designated voting representative identified by the member agency on the proxy designation form. The designated voting representative is required to register and sign as the proxy holder to receive the proxy card. Proxy cards will only be available for pick-up on Wednesday, November 29 between 9:00 a.m. and 12:00 p.m. at the ACWA General Session desk in the main foyer outside of the Marquis Ballroom Center, Marriott Anaheim.

The voting delegate must be indicated on the proxy form and returned to ACWA at the earliest convenience.

RECOMMENDATION:

Request Board direction on Board Member authorized to vote on behalf of the District.

ATTACHMENTS:

Bylaws Amendments
Election Procedures
Proxy Designation Form

Article 7 – Standing Committees

1. **Section 4. Committee Composition.** Each limited standing committee shall have a membership composition that is comprised of members in the quantity and with qualifications as defined by the provisions of these bylaws. The committee chair position shall not be included in the maximum count for determining the committee composition total of any given limited committee. The committee chair shall, however, be a voting member of their respective committee subject to the rules and procedures of each committee.

   Rationale: Staff is recommending this amendment to the bylaws to allow the President flexibility in appointing members to limited standing committees and to provide an odd number committee composition total.

   LAC Workgroup Analysis: The proposed revision is clear and meets its intended purpose.

2. **Committee Composition Terms in Sections 5 through 17.**
   Rationale. Staff noted that the use of the term "individual" versus "representative" (and one instance of "member") was inconsistent throughout the committee composition description for each of the standing committees in Article 7. Staff asked the LAC Workgroup to review Section 1, Qualifications, as well as each of the committee descriptions to make a determination as to which term best applies for all of the committees for purposes of consistency throughout Article 7.

   LAC Workgroup Analysis: Reading of the various ACWA committee sections suggests that "Member" would be the most appropriate word for consistency throughout the bylaws. However, the use of a single term, may require some minor revisions to surrounding text for clarity (for an example see Section 15 (State Legislative Committee) where "member" is separately used to denote a "member agency" and so would need to state "member-agency" consistently to accommodate the more general use of "member" throughout the bylaws).

   Staff Response: Staff revised the terms in the committee section descriptions (Sections 5 through 17) to "member" for consistency and the surrounding language where needed in response to the LAC Workgroup's analysis. **(See attached bylaws for proposed amendments to these sections.)**

3. **Section 5. Agriculture Committee.** There shall be an Agriculture Committee whose duty it shall be to recommend Association policy, positions and programs to the Board of Directors, State Legislative Committee, Federal Affairs Committee or other committees, as appropriate, regarding agricultural issues affecting the interests of ACWA and its members. The committee shall consist of at least one member from each region.

   Rationale: The 2016-2017 Business and Strategic Plan initiative to increase involvement and engagement from ACWA's agricultural members has successfully generated momentum amongst ACWA's agricultural members and a renewed attention to and involvement in key policy issues that uniquely affect agricultural water suppliers. Amidst this success, a concern has arisen that the momentum could be lost once the Board of Directors finishes its current term and the initiative sunsets. This concern has sparked the suggestion that ACWA should consider creating an Agriculture Committee as the thirteenth standing committee of the Association to continue the objectives of the Ag Initiative long-term.

   LAC Workgroup Analysis: The proposed revision is clean and meets its intended purpose.

4. **Section 12. Legal Affairs Committee.** There shall be a Legal Affairs Committee whose duty it shall be to support the mission of the Association, and more particularly to deal with requests for assistance involving legal matters of significance to members ~~of the Association~~ agencies, including but not limited to state and federal court litigation, water rights matters, selected regulatory and resources agency matters, proposed bylaw revisions, review of legislation as requested by the State Legislative Committee, etc. The committee shall consider matters and issues

submitted to it in order to determine which ones are of major significance to the members ~~of the Association~~ agencies and, assuming a finding of major significance, recommend to the Board of Directors the position(s) which the committee believes the Association should take with respect thereto. The committee shall be composed of between ~~35~~ 34 and ~~45~~ 44 attorneys, each of whom shall be a member of the California Bar and shall be, or act as, counsel for a member ~~of the Association~~ agency, representing diverse interests within the Association, including but not limited to, different geographical areas throughout the state, large and small agencies, agricultural and urban agencies, agencies created under the various enabling statutes, etc. ~~Further, there shall be at least one representative from each region on the committee.~~ The committee shall consist of a least one member from each region.

Rationale: Change the committee composition range so there is a resulting odd number total when the chair is added.

LAC Workgroup Analysis: Considered together with the general change in Section 4, Committee Composition, above, this change accomplishes its purposes and maintains the current overall LAC membership numbers.

Article 9 – Meeting of Members

5. **Section 8. Amendments, Revisions, and Resolutions.** Before any amendments or revisions to the bylaws, or resolutions, may be considered at any meeting of the Association, any such amendment, revision, or resolution shall be submitted to the executive director/secretary at least ~~30~~ 90 days prior to the first day of such meeting. The executive director/secretary shall promptly distribute any proposed amendments or revisions to the Legal Affairs Committee for the Legal Affairs Committee to develop an unbiased analysis of the amendments or revisions. Following development of an analysis for the proposed amendments or revisions, the executive director/secretary shall distribute copies of any resolutions, amendments or revisions, including any applicable analyses, to all members of the Association ~~at least five~~ not less than 10 days or more than 90 days prior to presentation at such meeting. The written notice of the membership meeting shall be given to each voting member of the Association consistent with the provisions defined in Section 3. The ~~30~~ 90-day rule may be suspended at any meeting of the Association by consent of three-fourths of the members present. Voting on resolutions, amendments, or revisions shall proceed as provided by Sections ~~3~~ 5 and 4 6 of this Article.

Rationale: Staff recommended that the deadline for submitting requests for amendments, revisions, and resolutions be changed from 30 to 120 days prior to any membership meeting to provide the Legal Affairs Committee sufficient time to review and develop the required analysis and for staff to provide adequate notice to the members as set forth in Article 9, Sections 3 and 4 of the bylaws. **Note: Staff typically notifies ACWA members at least 45 days prior to a given membership meeting to allow the member agency boards adequate time to designate their authorized voting representative.**

LAC Workgroup Analysis: This proposed revision is clear and meets its intended purpose. However, workgroup members did express some concern that the 120-day submission requirement may unduly limit the Association's ability to quickly respond to state or federal legislative or administrative acts appropriately. A supermajority of the Association may vote to suspend the requirement, however, it may be advisable to require only 90-days for submission while retaining the general Association distribution timing of no later than 10-days and no earlier than 90-days prior to presentation at an Association meeting.

Staff Response: Staff revised the proposed amendment to state 90 days instead of 120 days in response to the LAC Workgroup's analysis.

The Board of Directors recommends adoption of the proposed amendments to ACWA's Bylaws through a vote of the membership.

GENERAL SESSION/ELECTION PROCEDURES FOR ACWA 2017 FALL CONFERENCE

The following information is provided to inform the ACWA member agency delegates attending the 2017 Fall Conference of the procedures to be used pertaining to the nomination and election of ACWA officers and the vote by the membership on proposed amendments to the bylaws during the General Session Membership Meeting.

PROXY CARDS – (REQUIRED FOR VOTING)

ACWA will issue each member agency **present** one proxy card for voting purposes based on the designated voting representative identified by the member agency. In order to vote during the General Session Membership Meeting, the designated voting representative is required to register and sign as the proxy holder by 12:00 p.m. on Wednesday, November 29. Upon registration and sign-in, the voting delegate will receive the required proxy cards. Proxy cards will be available for pick-up on **Wednesday, November 29, between 9:00 a.m. and 12:00 p.m.** at the ACWA General Session Desk in the main foyer outside of the **Marquis Ballroom Center, Marriott Anaheim.** The luncheon and General Session Membership Meeting will be held in the Platinum Ballroom 1-6.

GENERAL SESSION MEMBERSHIP MEETING, WEDNESDAY, NOV. 29 (DOORS OPEN AT 1:05 P.M.)

1. The General Session Membership Meeting will be called to order at 1:20 p.m. and a quorum will be determined. The presence of 50 authorized voting representatives is required to establish a quorum for transacting business.

2. Legal Affairs Committee Chair Jeni Buckman will provide an overview of the agenda and election procedures.

3. Nominating Committee Chair John Coleman will present the committee's report and announce the candidate for ACWA President.

4. President Kathy Tiegs will call for floor nominations for ACWA President.

5. If there are no floor nominations for President, the election will proceed. President Tiegs will close the nominations and delegates will vote by holding up their "Yes" or "No" proxy voting cards.

6. If there are floor nominations for President, the nomination will follow the procedures established by Article 9 of ACWA's Bylaws, stating floor nominations and seconds must be supported by a resolution of the governing body of the member agency making and seconding such nomination. **Note: If there are floor nominations, the election of officers will proceed during Wednesday's General Session as outlined below and the proposed bylaws amendments will move to the Thursday General Session Membership Meeting as outlined in item 12 below.**

    a. Ballots will be distributed to the voting delegates.

    b. Delegates will complete their ballots and place them in the ballot box, which will be centrally located in the Platinum Ballroom 1-6 meeting room.

    c. Tellers' Committee will count the ballots. President Tiegs has appointed the following staff members to serve as the Tellers' Committee: Clerk of the Board Donna Pangborn; Director, Business Development & Events Paula Currie; and Executive Assistant Lili Vogelsang.

    d. Legal Affairs Committee Chair Jeni Buckman will serve as the proctor to oversee the ballot counting process.

    e. Candidates are welcome to designate an observer to be present during the ballot counting process.

    f. Results of the ballot count will be announced. Election of ACWA's officers will be determined by a majority of the members present and voting. If any one candidate does not receive a majority of the vote, successive ballot counts will be conducted until a candidate is elected, consistent with Robert's Rules of Order.

7. Nominating Committee Chair John Coleman will announce the candidate for ACWA Vice President.

8. President Kathy Tiegs will call for floor nominations for ACWA Vice President.

9. If there are no floor nominations for Vice President, the election will proceed. President Tiegs will close the nominations and delegates will vote by holding up their "Yes" or "No" proxy voting cards.

10. If there are floor nominations for Vice President, the nominations will follow the procedures described in item 6 above, and the election will proceed according to the steps outlined in 6.a. through 6.f.

IF THERE ARE NO FLOOR NOMINATIONS FOR THE ELECTION OF OFFICERS, THE WEDNESDAY GENERAL SESSION MEMBERSHIP MEETING WILL PROCEED WITH A VOTE ON THE PROPOSED AMENDMENTS TO THE BYLAWS.

11. Legal Affairs Committee Chair Jeni Buckman will provide an overview of the proposed amendments to the bylaws.

    a. Consideration of amendments to the bylaws.

    b. Request for motion / second from the floor to approve the proposed amendments to the bylaws.

    c. Discussion of proposed amendments.

    d. Opportunity for members to offer changes to proposed amendments to the bylaws. Any proposed changes to the bylaw amendments as currently proposed require **a majority vote of the voting members present**.

    e. Call for the question. A two-thirds vote of the members present and voting is required to amend the ACWA Bylaws.

IF THERE ARE FLOOR NOMINATIONS FOR THE ELECTION OF OFFICERS, THE OVERVIEW AND VOTE ON THE PROPOSED AMENDMENTS TO THE BYLAWS WILL BE TAKEN UP AT THE GENERAL SESSION MEMBERSHIP MEETING ON THURSDAY AS FOLLOWS.

12. The vote by the membership on the proposed amendments to the bylaws will occur at the Thursday, General Session Membership Meeting, at the Platinum Ballroom 1-6, Anaheim Marriott, at 1:20 p.m.

    a. The General Session Membership Meeting will be called to order at 1:20 p.m. and a quorum will be determined. The presence of 50 formally designated voting representatives is required to establish a quorum for transacting business.

    b. Legal Affairs Committee Chair Jeni Buckman will provide an overview of the proposed bylaws amendments.

    c. The meeting will proceed according to the steps outlined 11.a. through 11.e. above.

PROXY DESIGNATION FORM

ASSOCIATION OF CALIFORNIA WATER AGENCIES
GENERAL SESSION MEMBERSHIP MEETING(S)

WEDNESDAY, NOVEMBER 29, 2017 AT 1:20PM
THURSDAY, NOVEMBER 30, 2017 AT 1:20PM (IF NEEDED)

TO: **Donna Pangborn, Clerk of the Board**

EMAIL: **donnap@acwa.com**

FAX: **916-325-4857**

The person designated below will be attending the ACWA General Session Membership Meeting(s) on **Wednesday, November 29, 2017 (and November 30, 2017 if necessary)** as our voting delegate.

MEMBER AGENCY'S NAME	*AGENCY'S TELEPHONE No.*
MEMBER AGENCY'S AUTHORIZING REPRESENTATIVE	*SIGNATURE*
DELEGATE'S NAME	*SIGNATURE*
DELEGATE'S EMAIL	*DELEGATE'S TELEPHONE No.*
DELEGATE'S AFFILIATON (if different from assigning agency)[1]	*DATE*

[1] If your agency designates a delegate from another entity to serve as its authorized voting representative, please indicate the delegate's entity in the appropriate space above. Note: Delegates need to sign the proxy form indicating they have accepted the responsibility of carrying the proxy.

REMINDER: Proxy cards will be available for pick up on **Wednesday, November 29,** between **9:00 a.m.** and **12:00 p.m.** at the **ACWA General Session Desk** in the main foyer outside of the **Marquis Ballroom Center, Marriott Anaheim.** The luncheon and General Session Membership Meeting will be held in the Platinum Ballroom 1-6.