AGENDA

REGULAR MEETING OF THE BOARD OF DIRECTORS
LA PUENTE VALLEY COUNTY WATER DISTRICT
112 N. FIRST STREET, LA PUENTE, CALIFORNIA
MONDAY, MAY 15, 2017 AT 5:30 PM

1. CALL TO ORDER

2. PLEDGE OF ALLEGIANCE

3. ROLL CALL OF BOARD OF DIRECTORS

President Hastings____ Vice President Rojas____ Director Aguirre____

Director Escalera____ Director Hernandez____

4. PUBLIC COMMENT

Anyone wishing to discuss items on the agenda or pertaining to the District may do so now. The Board may allow additional input during the meeting. A five-minute limit on remarks is requested.

5. ADOPTION OF AGENDA

Each item on the Agenda shall be deemed to include an appropriate motion, resolution or ordinance to take action on any item. Materials related to an item on this agenda submitted after distribution of the agenda packet are available for public review at the District office, located at the address listed above.

6. APPROVAL OF CONSENT CALENDAR

There will be no separate discussion of Consent Calendar items as they are considered to be routine by the Board of Directors and will be adopted by one motion. If a member of the Board, staff, or public requests discussion on a particular item, that item will be removed from the Consent Calendar and considered separately.

A. Approval of Minutes of the Regular Meeting of the Board of Directors held on April 24, 2017.

B. Approval of District Expenses for the Month of April 2017.

C. Approval of City of Industry Waterworks System Expenses for the Month of April 2017.

D. Receive and File the District's Water Sales Report for April 2017.

E. Receive and File the City of Industry Waterworks System's Water Sales Report for April 2017.

F. Approval of Attendance to Water 101 Event at Upper San Gabriel Valley Municipal Water District on May 16, 2017 in Monrovia, CA.

7. ACTION / DISCUSSION ITEMS

A. Consideration of Resolution 246 Adopting the District's 2017 Water Master Plan.

Recommendation: Approve Resolution 246.

B. Consideration of Re-Investment of $150,000 of District Reserve Funds Consistent with the Offer Sheet Prepared by Dewane Investment Strategies dated May 12, 2017.

Recommendation: Authorize Re-investment of $150,000 in Certificates of Deposit of the Same Quality at the Most Favorable Coupon Rate Available at the Time of Acquisition Consistent with the Offer Sheet dated May 12, 2017.

C. Discussion Regarding the District's Involvement in the Public Water Agencies Group and Cost Sharing of an Emergency Preparedness Coordinator.

Recommendation: Board Discretion.

D. Discussion Regarding the Utilization of OPARC Services to Paint District Fire Hydrants.

Recommendation: Board Discretion.

E. Consideration of Sponsorship of the American Cancer Society's "Relay for Life" Event.

Recommendation: Board Discretion.

8. PROJECT ENGINEER'S REPORT

Recommendation: Receive and File report.

9. GENERAL MANAGER'S REPORT

Recommendation: Receive and File report.

10. OTHER ITEMS

A. Upcoming Events.

B. Information Items.

11. ATTORNEY'S COMMENTS

12. BOARD MEMBER COMMENTS

A. Report on Events Attended.

B. Other Comments.

13. FUTURE AGENDA ITEMS

14. ADJOURNMENT

POSTED: Friday, May 12, 2017

President David Hastings, Presiding.

Any qualified person with a disability may request a disability-related accommodation as needed to participate fully in this public meeting. In order to make such a request, please contact Mrs. Rosa Ruehlman, Board Secretary, at (626) 330-2126 in sufficient time prior to the meeting to make the necessary arrangements.

Note: Agenda materials are available for public inspection at the District office or visit the District's website at www.lapuentewater.com.

MINUTES OF THE REGULAR MEETING OF
THE BOARD OF DIRECTORS OF THE
LA PUENTE VALLEY COUNTY WATER DISTRICT

A regular meeting of the Board of Directors of the La Puente Valley County Water District was held on Monday, April 24, 2017, at 5:30 at the District office, 112 N. First St., La Puente, California.

Meeting called to order:
President Hastings called the meeting to order at 5:33 pm.

Pledge of Allegiance
President Hastings led the meeting in the Pledge of Allegiance.

Directors present:
David Hastings, President; William Rojas, Vice President; Charles Aguirre, Director; John P. Escalera and Henry Hernandez, Director.

Staff present:
Greg Galindo, General Manager; Rosa Ruehlman, Board Secretary; Gina Herrera, Customer Service/Accounting Supervisor; Roy Frausto, Compliance Officer/Project Engineer and Roland Trinh District Counsel.

Others Present:
Cindy Byerrum from Platinum Consultants, Christopher Brown and Jeff Palmer from Fedak & Brown LLP.

Public Comment:
No members of the public present.

Adoption of Agenda:
President Hastings asked for the approval of the agenda.
Motion by Vice President Rojas seconded by Director Hernandez, that the agenda be adopted as presented.

Motion approved by the following vote:
Ayes: Hastings, Rojas, Aguirre, Escalera and Hernandez.
Nays: None.

Consent Calendar:
President Hastings asked for the approval of the Consent Calendar:

- **A.** Approval of the Minutes of the Regular Meeting of the Board of Directors held on April 10, 2017.
- **B.** Receive and File the Industry Public Utilities 2016-17 Third Quarter Report.

Motion by Director Aguirre, seconded by Vice President Rojas, to approve the consent calendar as presented.

Motion approved by the following vote:
Ayes: Hastings, Rojas, Aguirre, Escalera and Hernandez.

Nays: None.

Financial Reports:

A. Summary of Cash and Investments as of March 31, 2017.

- Mr. Galindo presented the cash and investment summary. The District's total cash and investments total over $3.3M. The Industry Public Utilities Water Operations checking account balance is $629,844.
- Mr. Galindo stated that there will be a CD maturing in May for $100,000 with Raymond James Financial and he will report at the next board meeting for possible reinvestment.

Motion by Director Escalera, seconded by Vice President Rojas, to receive and file the Statement of the District's Revenues and Expenses as of March 31, 2017, as presented.

Motion approved by the following vote:
Ayes: Hastings, Rojas, Aguirre, Escalera and Hernandez.
Nays: None.

B. Statement of the District's Revenues and Expenses as of March 31, 2017.

- Mrs. Herrera summarized the Statement of Revenues and Expenses for the District and Treatment plant operations.
- Mrs. Herrera added that the 2016 Year to date numbers are final and audited.

Motion by President Hastings, seconded by Vice President Rojas, to receive and file the Statement of the District's Revenues and Expenses as of March 31, 2017, as presented.

Motion approved by the following vote:
Ayes: Hastings, Rojas, Aguirre, Escalera and Hernandez.
Nays: None.

C. Statement of the City of Industry Waterworks System's Revenues and Expenses as of March 31, 2017.

- Mrs. Herrera summarized the Statement of Revenues and Expenses for the City of Industry Waterworks System.
- Mr. Galindo added that staff has submitted a draft 2017-18 Budget to the City of Industry for their review.

Motion by President Hastings, seconded by Vice President Rojas, to receive and file the Statement of the City of Industry Waterworks System's Revenues and Expenses as of March 31, 2017, as presented.

Motion approved by the following vote:
Ayes: Hastings, Rojas, Aguirre, Escalera and Hernandez.
Nays: None.

Presentation by Fedak & Brown LLP of the 2016 Audit (See presentation)

- Mr. Brown gave a presentation of the audit process and the 2016 audit results of the District's financials.
- He shared the auditor's opinion that the financial statements are fairly presented in all material respects of the financial position of the District as December 31, 2016. He added this was a very clean audit.
- Mr. Brown shared that there are a couple of new reporting's in 2016 for GASB's 72 and 79, which the primary objective is to improve financial reporting for investment and pooled funds and also provides additional disclosures within the notes to the financial statements.
- Mr. Galindo shared that this audit went very well and Customer Service/Accounting Supervisor and District's Financial Consultant did a great job in supporting the audit

Action/Discussion Items:

A. Acceptance of 2016 Audit Prepared by Fedak & Brown LLP.

- Mrs. Byerrum shared some comments about the audit process and how smooth it went. She expressed that Fedak & Brown were great to work with.
- Mrs. Byerrum stated that one of the big adjustments made this year were to the depreciable items. She also worked on, for the second year, the GASB 68 entries and how the CalPERS does some of the schedules and staff now has a better understanding of how it works.
- Mrs. Byerrum stated as for how the 2016 actuals compare to the budget, the operational revenues are at 81% and the total Expense are at 89% at yearend and the District ended the year favorably.

After further discussion, motion by President Hastings, seconded by Director Aguirre, to receive and file the 2016 Audit Prepared by Fedak & Brown LLP.

Motion approved by the following vote:
Ayes: Hastings, Rojas, Aguirre, Escalera and Hernandez.
Nays: None.

B. Consideration of Single Pass Ion Exchange Resin Replacement Services.

- Mr. Galindo reported it is that time again for the Single Pass Ion Exchange Resin Replacement and disposal at the treatment plant facility and that this is a BPOU Project expense and is 100% reimbursable by the Cooperating Respondents.
- Mr. Galindo stated the next change out is scheduled in May or early June. District Staff prepared and sent a notice inviting bids. The requirements are to secure services for the replacement and disposal of up to 1,696 cubic-feet (4 vessel change-outs, 424 cubic feet each) of perchlorate selective ion exchange resin. Bids were received on Friday April 21st from Calgon Carbon and Evoqua. Mr. Galindo provided a summary table of the bid results, which showed Evoqua's bid as the lowest.
- He is asking for authorization to enter into an agreement with the Evoqua for the Single Pass Ion Exchange Resin Replacement Services utilizing the Dow PSR2 resin with the option to purchase the Dow PSR 2 Plus resin once it is approved by DDW for use at the District's treatment plant facility.

After further discussion, motion by Director Aguirre, seconded by Director Hernandez, to authorize General Manager to secure the services of Evoqua Water Technologies for the replacement and disposal of up to 1,696 cubic-feet of Perchlorate Selective Ion Exchange Resin utilizing the Dow PSR2 resin with the option to purchase the Dow PSR2 Plus resin.

Motion approved by the following vote:
Ayes: Hastings, Rojas, Aguirre, Escalera and Hernandez.
Nays: None.

Project Engineer's Report:
Mr. Frausto presented his report: (See memo)

- He provided a memorandum of the activities he and Staff worked on during the month of March 2017 and highlighted some of those items in his report.

After further discussion, motion by Vice President Rojas seconded by Director Aguirre, to receive and file the Project Engineer's report as presented.

Motion approved by the following vote:
Ayes: Hastings, Rojas, Aguirre, Escalera and Hernandez.
Nays: None.

General Manager's Report:

- Mr. Galindo reported he will be providing a draft District's Summer newsletter at the next board meeting.
- Watermaster Engineer has provided a preliminary determination of the operating safe yield for the coming year 2017-18, which is 150,000 acre feet. The final operating safe yield will be voted on by the Watermaster Board in the first week of May along with the production assessments.

Information Items:

A. Upcoming Events.

- Mrs. Ruehlman provided an update on the upcoming events for 2017, and who will be attending.
- Mrs. Ruehlman shared that the San Gabriel Valley Water Association Quarterly luncheon date and location have been confirmed for May 17, 2016, at the South Hills Country Club in West Covina.
- She also reminded the Board that the next regular Board meeting is May 15, 2017.

B. Correspondence to the Board of Directors.

- Water 101 will be held at the Upper San Gabriel Municipal Water District on Tuesday, May 16, 2017, 8:30 to 11:00 am. This item will be agendized for consideration of attendance at the next Board meeting.

Board member comments:

A. Report on events attended.

- President Hastings and Director Escalera reported their attendance to the AWWA CA/NV on April 12-13th in Anaheim.

B. Other comments.

- Board had no comments.

Future agenda items:

- No future items.

Adjournment:

There is no further business or comment, the meeting was adjourned at 6:48 p.m.

David Hastings, President	Rosa B. Ruehlman, Secretary

La Puente Water District April 2017 Disbursements

Check #	Payee		Amount	Description
4660	ACWA/JPIA	$	14,316.42	Difference in Conditions Coverage
4661	ACWA/JPIA	$	5,846.56	Workman's Comp Insurance
4662	Chevron	$	1,898.34	Truck Fuel
4663	Collicutt Energy Services Inc	$	841.63	Generator Maintenance
4664	EcoTech Services Inc	$	555.00	UHET Program
4665	Eva's Cleaning Service	$	420.00	Cleaning Service
4666	Fedak & Brown LLP	$	6,000.00	2016 Audit Expense
4667	Highroad IT	$	402.00	Technical Support
4668	Industry Public Utilites	$	25,449.56	Web Payments March 2017
4669	Jiffy Lube My Fleet Center	$	142.22	Truck Maintenance
4670	Merritt's Hardware	$	306.96	Field Supplies
4671	MJM Communications & Fire	$	600.00	Security Monitoring Service
4672	O'Reilly Auto Parts	$	3.58	Truck Maintenance
4673	SC Edison	$	6,271.11	Power Expense
4674	Time Warner Cable	$	261.33	Telephone Service
4675	Underground Service Alert	$	38.25	Line Notifications
4676	Valley Vista Services	$	296.64	Trash Service
4677	Vulcan Materials Company	$	293.64	Field Expense - Asphalt
4678	Western Water Works	$	5,311.79	Field Supplies - Inventory
4679	Hach Company	$	1,055.28	Field Supplies
4680	Northstar Chemical	$	7,386.33	Chemical Expense
4681	So Cal Industries	$	140.00	Restroom Service @ Treatment Plant
4682	Time Warner Cable	$	518.71	Telephone Service
4683	Trojan UV	$	14,138.68	Chemical Expense
4684	Waste Management of SG Valley	$	190.84	Trash Service
4685	Weck Laboratories Inc	$	4,398.75	Water Sampling
4686	Weck Laboratories Inc	$	2,307.00	Water Sampling
4687	Answering Service Care	$	78.06	Answering Service
4688	Citi Cards	$	1,498.34	Conference Expenses
4689	Elite Equipment Inc	$	319.66	Field Supplies
4690	Griffith Air Tool	$	571.82	Water Pump Maintenance
4691	InfoSend	$	892.08	Billing Expense
4692	Platinum Consulting Group	$	658.75	Administrative Support
4693	Resource Building Materials	$	13.87	Field Expense - Concrete
4694	SC Edison	$	104.81	Power Expense
4695	Time Warner Cable	$	231.76	Telephone Service
4696	Weck Laboratories Inc	$	203.50	Water Sampling
4697	Vulcan Materials Company	$	842.15	Field Expense - Asphalt
4698	David H Hastings	$	110.49	AWWA Conference Expenses
4699	CAT Specialties Inc	$	1,378.84	Field Uniforms
4700	World Space Foundation	$	1,000.00	Water Education Services

La Puente Water District April 2017 Disbursements - continued

Check #	Payee		Amount	Description
4701	Roy Frausto	$	66.57	AWWA Conference Expenses
4702	John P Escalera	$	29.78	AWWA Conference Expenses
4703	ACWA/JPIA	$	30,706.57	Health Benefits
4704	Bank of America-Visa	$	239.06	Administrative Expenses
4705	Cell Business Equipment	$	53.78	Office Expense
4706	Citi Cards	$	1,268.91	Conference, Administrative & Office Expenses
4707	Civiltec Engineering Inc	$	7,643.40	Del Valle Project
4708	Ferguson Waterworks	$	237.08	Meter Expense
4709	Grainger Inc	$	103.31	Safety Supplies
4710	Highroad IT	$	100.00	SSL License Renewal
4711	Jack Henry & Associates	$	37.38	Web E-Check Fee's
4712	Lagerlof, Senecal, Gosney & Kruse	$	11,789.82	Attorney Fee's
4713	Lincoln National Life Insurance Company	$	593.96	Disability Insurance
4714	MetLife	$	285.99	Life Insurance
4715	Premier Access Insurance Co	$	2,801.74	Dental Insurance
4716	S & J Supply Co Inc	$	1,865.62	Field Supplies - Inventory
4717	San Gabriel Valley Water Association	$	125.00	Seminar Expense
4718	San Gabriel Valley Water Company	$	145.22	Water Service @ Treatment Plant
4719	Staples	$	48.20	Office Supplies
4720	Weck Laboratories Inc	$	70.50	Water Sampling
4721	Western Water Works	$	1,662.57	Field Supplies - Inventory
4722	SC Edison	$	24,726.04	Power Expense
4723	Verizon Wireless	$	354.29	Cell Phone Service
4724	Calif Utility Exec Mgmt Assoc	$	800.00	Agency Membership
4725	So Cal Water Utilities Association	$	180.00	Seminar Expense
4726	Mancilla's Quality Printing	$	215.33	Water Education Services
4727	Petty Cash	$	54.11	Office/Field Expense
Online	Home Depot	$	207.63	Field Supplies
Autodeduct	Wells Fargo	$	197.20	Merchant Fee's
Autodeduct	Wells Fargo	$	459.72	Bank Fee's
Autodeduct	First Data Global Leasing	$	60.76	Credit Card Machine Lease
Autodeduct	Bluefin Payment Systems	$	689.78	Web Merchant Fee's
On-line	United States Treasury	$	21,172.10	Federal, Social Security & Medicare Taxes
On-line	EDD	$	3,334.81	California State & Unemployment Taxes
On-line	Lincoln Financial Group	$	3,954.00	Deferred Comp
On-line	CalPERS	$	11,885.27	Retirement Program
	Total Payments	**$**	**235,460.25**	

La Puente Valley County Water District
Payroll Summary
April 2017

	April 2017
Wages, Taxes and Adjustments	
Gross Pay	
Total Gross Pay	85,830.52
Deductions from Gross Pay	
457b Plan Employee	-3,954.00
CalPers EEC	-878.64
MetLife	-97.12
Total Deductions from Gross Pay	-4,929.76
Adjusted Gross Pay	80,900.76
Taxes Withheld	
Federal Withholding	-8,013.00
Medicare Employee	-1,247.09
Social Security Employee	-5,332.46
CA - Withholding	-3,334.37
Medicare Employee Addl Tax	0.00
Total Taxes Withheld	-17,926.92
Net Pay	**62,973.84**
Total Employer Taxes and Contributions	6,756.99

La Puente April 2017 Disbursements

Total Vendor Payables	$ 235,460.25
Total Payroll	$ 62,973.84
Total April 2017 Disbursements	$ 298,434.09

Invoice No. 4- 2017-04

May 1, 2017

BPOU Project Committee Members

RE: BPOU O & M Expense Reimbursement Summary

The following cost breakdown represents O & M expenses incurred by the LPVCWD for the month of April 2017.

BPOU Acct No.	Description	Invoice No.	Vendor	Amount	Subtotal
LP.02.01.01.00	Power	2-15-629-6188	SC Edison	$ 13,577.66	
		2-03-187-2179	SC Edison	$ 11,148.38	$ 24,726.04
LP.02.01.02.00	Labor Costs	Apr-17	LPVCWD	$ 21,699.41	$ 21,699.41
LP.02.01.05.00	Transportation	Apr-17	LPVCWD - 1345 miles @ .535	$ 719.58	$ 719.58
LP .02.01.07.00	Water Testing	W7D0245	Weck Labs	$ 656.50	
		W7D0549	Weck Labs	$ 307.00	
		W7D0554	Weck Labs	$ 307.00	
		W7D0557	Weck Labs	$ 656.50	
		W7D0559	Weck Labs	$ 656.50	
		W7D0565	Weck Labs	$ 56.00	
		W7D0913	Weck Labs	$ 226.50	
		W7D0915	Weck Labs	$ 56.00	
		W7D1324	Weck Labs	$ 226.50	
		W7D1325	Weck Labs	$ 56.00	
		W7D1328	Weck Labs	$ 200.00	
		W7D1480	Weck Labs	$ 200.00	
		W7D1481	Weck Labs	$ 159.00	
		W7D1482	Weck Labs	$ 542.00	
		W7D1483	Weck Labs	$ 367.00	
		W7D1484	Weck Labs	$ 200.00	
		W7D1485	Weck Labs	$ 159.00	
		W7E0001	Weck Labs	$ 56.00	
		W7E0010	Weck Labs	$ 200.00	$ 5,287.50
LP.02.01.10.00	Operations Monitoring	9462; 04/17	Time Warner Cable	$ 218.71	
		2906; 04/17	Time Warner Cable	$ 300.00	$ 518.71
LP.02.01.12.00	Materials/Supplies				
LP.02.01.12.02	Filter Cartridges	94978225	Pall Corporation	$ 6,624.66	$ 6,624.66
LP.02.01.12.06	Sodium Hypochlorite	100806	Northstar Chemical	$ 1,594.02	
		101517	Northstar Chemical	$ 1,524.72	$ 3,118.74
LP.02.01.12.15	Other Expendables	6031207	Home Depot	$ 52.69	
		097940	Merritt's	$ 21.73	
		098248	Merritt's	$ 32.16	$ 106.58
LP.02.01.14.00	Repair/Replacement	Z173788	Kaman Industrial Technologies	$ 396.26	
		SBD01183013	Konecranes	$ 289.00	
		24261410	McMaster-Carr	$ 61.73	
		26123125	McMaster-Carr	$ 58.14	
		45-2017	Tri-County Pump Company	$ 12,763.19	
		SLS/10260321	Trojan UV	$ 43,878.80	$ 57,447.12
LP.02.01.15.00	Contractor Labor	SLS/10260357	Trojan UV	$ 23,228.00	$ 23,228.00
LP.02.01.80.00	Other O & M	AS;2016-3TP	Fedak & Brown, LLP	$ 1,657.00	
		19632	HighRoad IT	$ 134.00	
		13251	MJM Communications	$ 186.00	
		30326	Platinum Consulting Group	$ 246.87	
		266660	So Cal Industries	$ 140.00	
		9882644-2519-6	Waste Management	$ 190.84	$ 2,554.71
				Total Expenditures	$ 146,031.05
				District Pumping Cost Deduction	$ 13,343.22
				Total O & M	**$ 132,687.83**
				Total Capital Cost Reimbursable	$ -
				Total Cost Reimbursable	**$132,687.83**

Industry Public Utilities April 2017 Disbursements

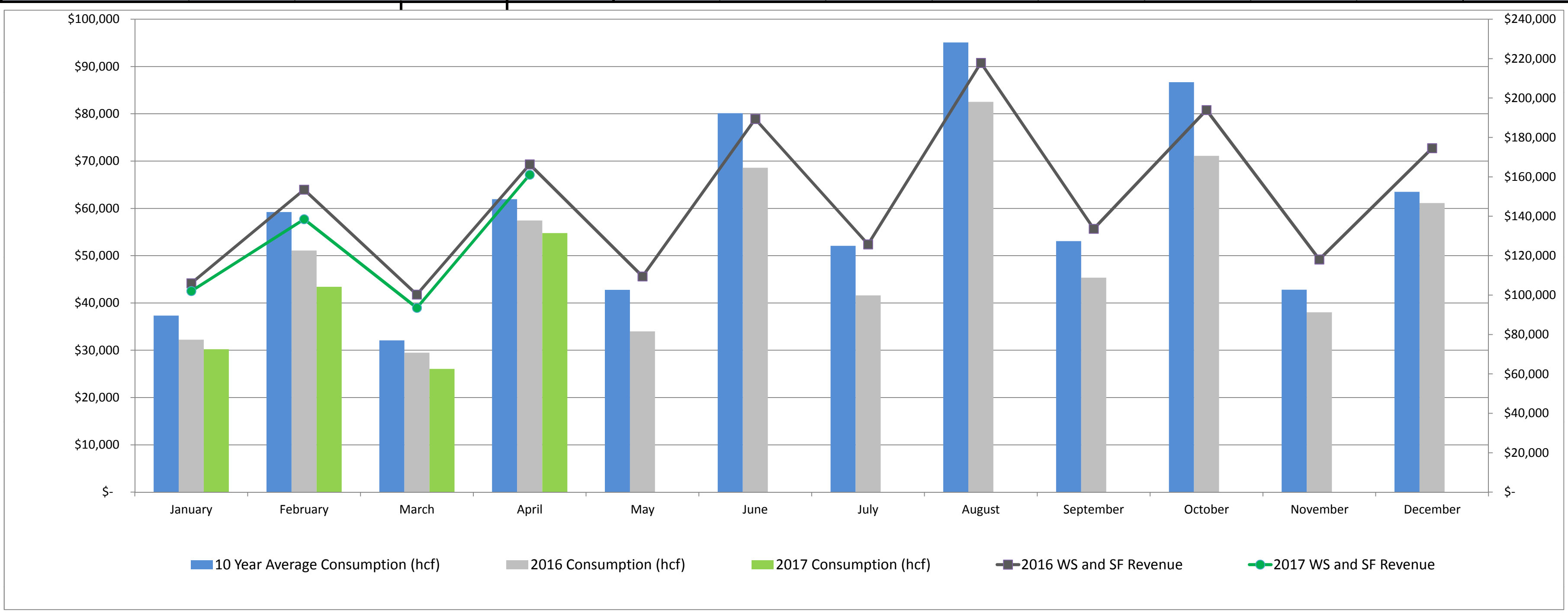
Check #	Payee		Amount	Description
2525	ACWA/JPIA	$	4,037.96	Difference in Condition Coverage
2526	ACWA/JPIA	$	1,461.64	Workman's Comp Insurance
2527	Bill Wright's Paint	$	184.44	Field Supplies
2528	Collicutt Energy Services Inc	$	812.77	Generator Maintenance
2529	EcoTech Services Inc	$	2,535.00	UHET Program
2530	Ferguson Enterprises Inc #1350	$	29.47	Field Supplies
2531	Highroad IT	$	268.00	Technical Support
2532	La Puente Valley County Water District	$	63,867.70	Labor Costs March 2017
2534	Merritt's Hardware	$	315.03	Field Supplies
2535	MJM Communications & Fire	$	150.00	Security Monitoring
2536	S & J Supply Co Inc	$	528.53	Field Supplies
2537	SoCal Gas	$	15.78	Gas Expense
2538	Time Warner Cable	$	51.51	Telephone Service
2539	Time Warner Cable	$	261.33	Telephone Service
2540	Underground Service Alert	$	38.25	Line Notifications
2541	Vulcan Materials Company	$	293.64	Field Expense - Asphalt
2542	Weck Laboratories Inc	$	645.00	Water Sampling
2543	Merritt's Hardware	$	304.31	Field Supplies
2544	Answering Service Care	$	78.06	Answering Service
2545	Elite Equipment Inc	$	319.65	Field Supplies
2546	Griffith Air Tool	$	571.81	Water Pump Maintenance
2547	InfoSend	$	731.90	Billing Expense
2548	Platinum Consulting Group	$	82.50	Administrative Support
2549	SoCal Gas	$	20.95	Gas Expense
2550	Vulcan Materials Company	$	842.14	Field Expense - Asphalt
2551	Weck Laboratories Inc	$	107.50	Water Sampling
2552	CAT Specialties Inc	$	1,378.83	Field Uniforms
2553	Clara Gonzalez	$	20.00	Customer Overpayment Refund
2554	Bill Wright's Paint	$	171.82	Field Supplies
2555	Cell Business Equipment	$	53.77	Office Expense
2556	Civiltec Engineering Inc	$	1,950.00	Master Plan Expense
2557	Ferguson Enterprises Inc #1350	$	35.77	Field Supplies
2558	Grainger Inc	$	103.30	Safety Supplies
2559	Highroad IT	$	211.00	Domain & SSL License Renewal
2560	Industry Public Utility Commission	$	339.64	Industry Hills Power Expense
2561	Jack Henry & Associates	$	52.37	Web E-Check Fee's
2562	La Puente Valley County Water District	$	574.75	Web CC & Bank Fee's Reimbursement
2563	Lagerlof, Senecal, Gosney & Kruse	$	159.00	Attorney Fee's
2564	S & J Supply Co Inc	$	3,021.55	Service Line Replacement
2565	San Gabriel Valley Water Company	$	1,330.26	Purchased Water - Salt Lake

Industry Public Utilities April 2017 Disbursements - continued

Check #	Payee		Amount	Description
2566	SC Edison	$	7,923.77	Power Expense
2567	SoCal Gas	$	14.30	Gas Expense
2568	Staples	$	48.20	Office Supplies
2569	State Water Resource Control Board	$	9,269.00	Water System Fee's
2570	Verizon Wireless	$	354.28	Cell Phone Service
2571	Petty Cash	$	69.90	Office/Field Expense
Online	Home Depot	$	871.78	Field Supplies
Autodeduct	Wells Fargo Merchant Fee's	$	88.47	Merchant Fee's
Autodeduct	First Data Global Leasing	$	60.76	Credit Card Machine Lease
	Total April 2017 Disbursements	**$**	**106,657.39**	

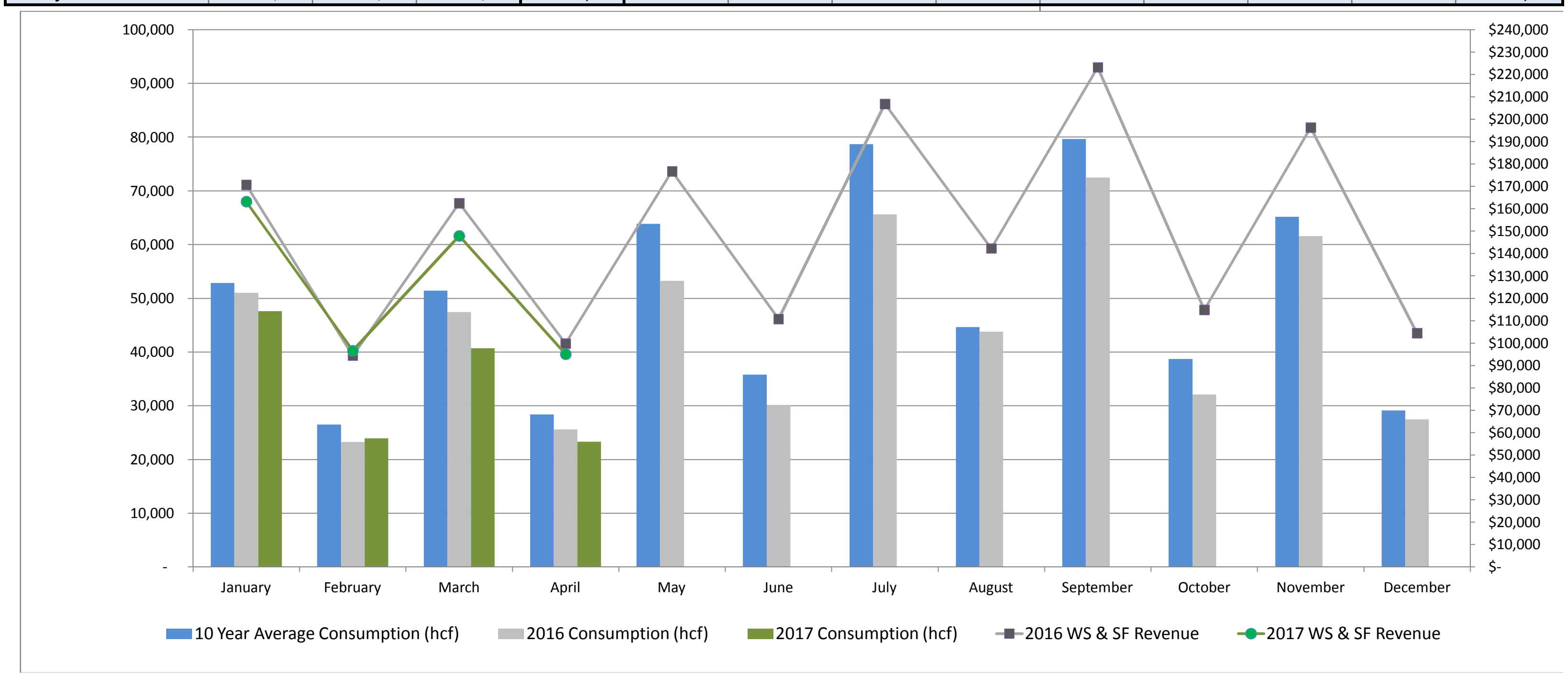
WATER SALES REPORT LPVCWD 2017

LPVCWD	January	February	March	April	May	June	July	August	September	October	November	December	YTD
No. of Customers	1,188	1,225	1,183	**1,228**	-	-	-	-	-	-	-	-	**4,824**
2017 Consumption (hcf)	30,207	43,404	26,046	**54,765**	-	-	-	-	-	-	-	-	**154,422**
2016 Consumption (hcf)	32,243	51,102	29,493	**57,451**	33,994	68,606	41,594	82,514	45,359	71,112	38,021	61,125	**612,614**
10 Year Average Consumption (hcf)	$ 37,331	$ 59,234	$ 32,104	**61,962**	$ 42,767	$ 80,140	$ 52,081	$ 95,093	$ 53,074	$ 86,687	$ 42,815	63,496	**706,782**
2017 Water Sales	$ 56,237	$ 83,965	$ 47,979	**$ 106,562**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 294,743**
2016 Water Sales	$ 60,494	$ 99,236	$ 54,751	**$ 111,992**	$ 63,934	$ 134,930	$ 80,192	$ 163,798	$ 87,848	$ 139,800	$ 72,334	$ 119,456	**$ 1,188,767**
2017 Service Fees	$ 45,815	$ 54,553	$ 45,542	**$ 54,533**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 200,444**
2016 Service Fees	$ 45,513	$ 54,279	$ 45,512	**$ 54,348**	$ 45,539	$ 54,451	$ 45,551	$ 54,044	$ 45,784	$ 54,104	$ 45,759	$ 55,090	**$ 599,974**
2017 Hyd Fees	$ 950	$ 950	$ 950	**$ 950**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 3,800**
2017 DC Fees	$ 317	$ 6,962	$ 380	**$ 7,014**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 14,673**
2017 System Revenue	$ 103,318	$ 146,431	$ 94,852	**$ 169,059**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 513,660**



WATER SALES REPORT CIWS 2017

CIWS	January	February	March	April	May	June	July	August	September	October	November	December	YTD
No. of Customers	956	851	958	**852**	-	-	-	-	-	-	-	-	**3,617**
2017 Consumption (hcf)	47,606	23,933	40,733	**23,336**	-	-	-	-	-	-	-	-	**135,608**
2016 Consumption (hcf)	51,014	23,246	47,428	**25,586**	53,232	30,162	65,617	43,802	72,486	32,073	61,597	27,487	**533,730**
10 Year Average Consumption (hcf)	52,850	26,517	51,414	**28,401**	63,879	35,827	78,661	44,666	79,663	38,695	65,187	29,130	**594,889**
2017 Water Sales	$ 106,782	$ 52,614	$ 90,766	**$ 51,161**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 301,323**
2016 Water Sales	$ 114,600	$ 50,870	$ 106,339	**$ 56,178**	$ 120,403	$ 67,151	$ 150,423	$ 98,801	$ 166,716	$ 71,308	$ 139,893	$ 60,542	**$ 1,203,224**
2017 Service Fees	$ 56,427	$ 44,029	$ 57,111	**$ 43,894**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 201,460**
2016 Service Fees	$ 56,143	$ 43,530	$ 56,179	**$ 43,621**	$ 56,350	$ 43,611	$ 56,399	$ 43,492	$ 56,460	$ 43,537	$ 56,377	$ 43,902	**$ 599,601**
2017 Hyd Fees	$ 1,575	$ 225	$ 1,625	**$ 225**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 3,650**
2017 DC Fees	$ 10,901	$ 2,511	$ 11,617	**$ 2,578**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 27,607**
2017 System Revenues	$ 175,685	$ 99,379	$ 161,119	**$ 97,857**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 534,040**



WATER 101

An informational overview for elected officials and key stakeholders, highlighting the following topics:

- Governance Structure
- Water Quality
- Basin Management
- Imported & Local Supplies
- Water Policy Issues
- Water Use Efficiency

WHEN: **Tuesday, May 16, 2017**

8:30 to 9 a.m. - *Breakfast & Networking*

9 to 11 a.m. - *Program*

LOCATION: **Upper District Board Room**

602 E. Huntington Drive, Suite B. Monrovia, CA 91016

RSVP: **Manuel Gouveia**

manuel@usgvmwd.org or (626) 443-2297

Please RSVP by May 13 to reserve your seat!

Brought to you by:

MainSanGabrielBasin WATERMASTER

UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT

WQA San Gabriel Basin Water Quality Authority

RESOLUTION NO. 246

RESOLUTION OF THE BOARD OF DIRECTORS OF THE LA PUENTE VALLEY COUNTY WATER DISTRICT ADOPTING THE 2017 WATER MASTER PLAN

WHEREAS, A Water Purveyor typically prepares and update to its water master plan every five to ten years to provide a comprehensive up to date analysis of its water system and provide recommendations for capital improvements; and

WHEREAS, the La Puente Valley County Water District (the "District") prepared its first water master plan in 1996 and updated its plan in 2002 and in 2009; and

WHEREAS, the District is dedicated to providing high quality water service at the most reasonable cost possible; and

WHEREAS, the District's Board of Directors (the "Board") supports the District's continuous and ongoing planning efforts designed to protect its existing water supply system while also exploring potential new water supplies and system infrastructure that will help meet the current and future needs of the District's customers; and

WHEREAS, the Board recognizes that identifying requisite improvement projects and managing their costs is essential to maintaining the District's goal of providing water at the most reasonable cost for its customers; and

WHEREAS, the District has now completed a comprehensive update to its water master plan called the 2017 Water Master Plan; and

WHEREAS, the improvement projects identified in the 2017 Mater Plan shall be considered independently by the Board, and approval of the 2017 Water Master Plan is not an approval of each and every improvement project identified therein;

NOW, THEREFORE, BE IT RESOLVED that the La Puente Valley County Water District hereby adopts the 2017 Water Master Plan; and

BE IT FURTHER RESOLVED that the 2017 Water Master Plan shall be utilized by District staff to prepare and complete selected projects identified therein, as may be approved by the Board; and

BE IT FURTHER RESOLVED that the 2017 Water Master Plan shall be utilized by District staff to complete a cost of service analysis, which will serve as the basis for the District's water rates moving forward.

ADOPTED this 15th day of May, 2017.

____
David Hastings, Board President

ATTEST:

____
Rosa Ruehlman, Board Secretary

2017 WATER MASTER PLAN UPDATE

FOR

LA PUENTE VALLEY
COUNTY WATER DISTRICT

LOCATED AT

112 N 1st STREET
LA PUENTE, CA 91744

Prepared By:

Civlitec Engineering, Inc.
&
La Puente Valley County Water District

Submitted: May 2017

EXECUTIVE SUMMARY

CHAPTER ONE - INTRODUCTION

CHAPTER TWO – LAND USE AND WATER REQUIREMENTS

CHAPTER THREE – SOURCES OF SUPPLY

CHAPTER FOUR – WATER QUALITY

FIGURES

TABLES

EXECUTIVE SUMMARY

The La Puente Valley County Water District (LPVCWD) owns and operates a water supply, treatment, and distribution system that serves portions of the City of La Puente and the City of Industry. LPVCWD's mission is

"*To provide its customers with high quality water for residential, commercial, industrial and fire protection uses that meets or exceeds all local, state and federal standards and to provide courteous and responsive service at the most reasonable cost*."

LPVCWD staff and Civiltec Engineering, Inc., developed the Water Master Plan (WMP) to provide LPVCWD guidance for long-term planning, recommendations for Capital Improvement Projects (CIP), and a working Hydraulic Model to assess the water system with respect to pressure, capacity, compliance, and efficiency.

The District recognizes that identifying requisite improvement projects and managing costs is essential to the District's Mission. The WMP shall be utilized by the District to prepare and complete selected projects identified therein, which shall be independently approved by the District's Board of Directors. The WMP will also be utilized by the District to support a cost of service analysis, which will serve as the basis for the District's water rates moving forward.

2017 WATER MASTER PLAN

The WMP addresses and evaluates LPVCWD's system through various chapters as listed below:

- **Chapter 1: Introduction** – Provides a general overview of LPVCWD along with the study area, study period, and scope of the 2017 WMP
- **Chapter 2**: **Land Use and Water Requirements –** Summary of land use planning as it influences LPVCWD
- **Chapter 3**: **Sources of Supply** – Summary of sources and alternative sources at LPVCWD
- **Chapter 4**: **Water Quality** – Status and potential impacts of water quality on the LPVCWD water system
- **Chapter 5**: **Existing Water System** – Summary of existing system components
- **Chapter 6**: **Computer Model** – Description of the computer modeling program used to model LPVCWD's water system
- **Chapter 7**: **Water Conservation Programs** – Provides guidance for the implementation of water conservation programs in line with LPVCWD's goals
- **Chapter 8**: **Evaluation Criteria** – List the design and planning criteria used to (1) evaluate the existing distribution system and (2) for recommending improvements
- **Chapter 9**: **Analysis and Proposed Improvements** – Evaluates the current system and provides a CIP aimed to resolve hydraulic issues and cyclical replacement

FINDINGS

As summarized and discussed in the 2017 WMP, LPVCWD's water system can be categorized as in "good condition" based on the following findings:

- **Water Demands** - Over the past 20 years, the number of service connections increased at an average rate of approximately 1% per year. This growth rate is based on the similar growth rates identified in the LPVCWD's historic number of service connections and the projected long-term growth rate in the City of La Puente. The projected average rate of increase of water demand over the next 20 years is approximately 5% per year.
- **Water Quality** – LPVCWD's Treatment Plant can treat its source water to meet all current state and federal drinking water quality regulations for the next 10 years, with the exception of Nitrate. Based on historical data and future Nitrate concentration projections, LPVCWD should have a treatment plan in place to treat for Nitrate at Well #3.
- **Water Conservation** – To reduce the reliance of imported water supplies, the top 5 potential water use reduction projects for consideration at LPVCWD involve a Recycled Water System, Leak Detection and Repair, Smart Meters, Turf Removal, and Residential Ultra Low Flow Toilets.
- **Source of Supply** - Based on current and future demand projections, LPVCWD's source of supply has a slight surplus under primary supply design criteria (largest source out of service) and over a 7,000 gpm surplus under secondary supply design criteria (with all sources available, including interconnections).
- **Storage Facilities** – LPVCWD system has adequate storage supply to meet fire flow demands, maximum day demands, and peak hourly demands.
- **Pumping Facilities** - Per supply design criteria, there should be sufficient booster pumping capacity in each pressurized zone without gravity storage to meet (1) combined production capacity of maximum day demand (MDD) with fire flow at 20 psi, and (2) Peak Hourly Demand (PHD) at a minimum system pressure of 40 psi. After analyzing all booster station facilities, the only booster station that wasn't able to achieve its dependent MDD requirement with fire flow was the Hudson Booster Station by a deficit of approximately 300 gpm.
- **Distribution System** - The primary function of a distribution system is to carry supply to where it is needed. The hydraulic model analysis proved that 1% of fire hydrants were not able to meet current fire code supply demand. The identified hydrants (1%) that did not meet current fire standards were constructed during the 1950's and 1960's under a different fire code requirements.

  After assessing the distribution system, 85% of the system's waterlines will reach maturity in 18 years. It is recommended that LPVCWD consider a pipe replacement programs that starts at 0 in 2016 and increases by 380 feet per year until 2034.

Acknowledging the aforementioned and the recommended improvements identified in the WMP, in the next 10 years, LPVCWD's capital improvement project cost are estimated at $6.5 million dollars and $2.8 million dollars for maintenance projects.

CHAPTER ONE – INTRODUCTION

1.1 General Description

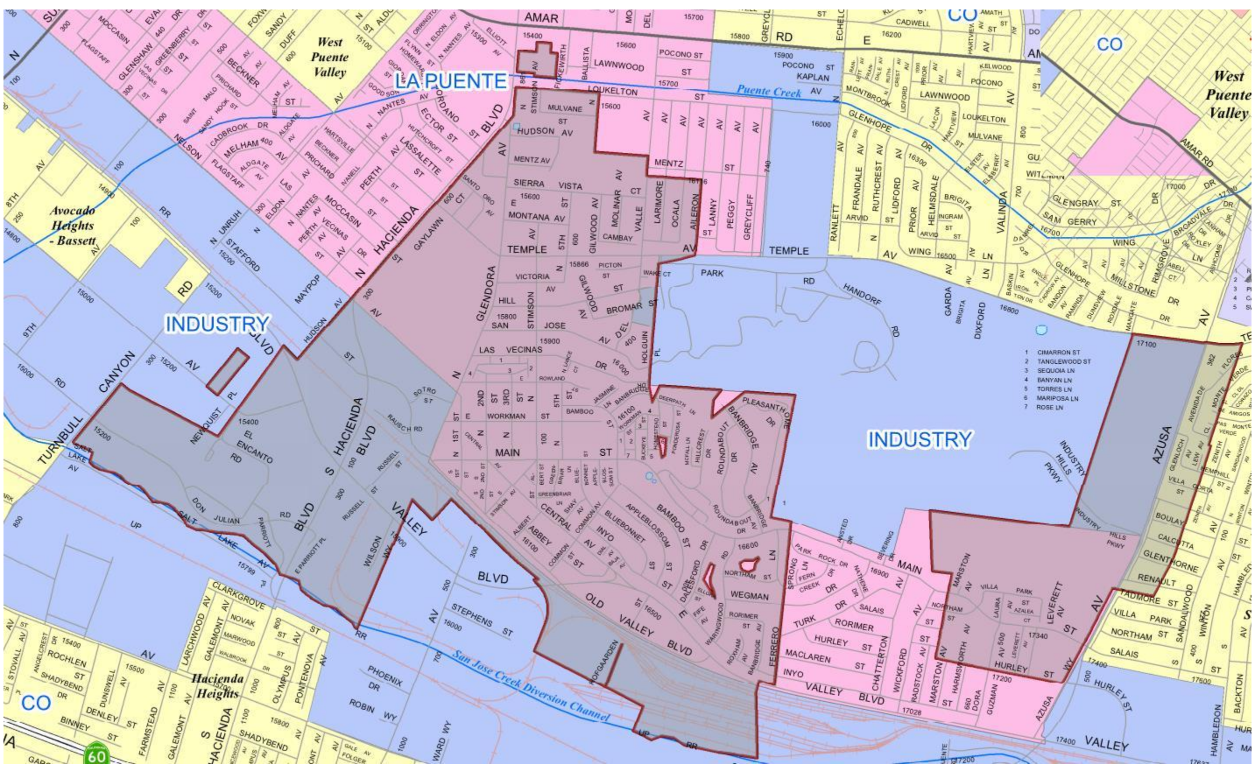
This Water Master Plan (WMP) is a stand-alone living document intended to provide comprehensive analysis of the La Puente Valley County Water District (LPVCWD) water system. Any recommendations for capital improvements are made from the perspective of the historical data available and at the time of the WMP's preparation.

LPVCWD maintains interconnectivity with nearby water suppliers primarily supported by numerous interconnections with the City of Industry Waterworks System (CIWS). As a result, benefits in supply, storage and distribution are achieved by coordinating operation between both systems that will enable LPVCWD to maximize redundancy and minimize or delay the cost of improvements wherever possible.

1.2 Study Area

The LPVCWD serves portions of the City of La Puente and the City of Industry. The boundary map of the service area is provided in **Figure 1-1.**

Figure 1-1 – Boundary Map of LPVCWD



In addition, LPVCWD manages and operates the City of Industry Waterworks System (CIWS), which includes 1,860 residential service connections, 34.4 miles of distribution and transmission mains, 1 active Well, 5 booster pump stations, and 3 reservoirs.

1.3 Study Period

Historical data for the six-year period, from calendar years 2010 to 2016, is considered as representative of existing conditions. This period has been referenced herein as the Study Period.

1.4 Scope of Report

Following are the tasks completed as part of this master planning project.

1.4.1 Land Use and Water Requirements

Land Use Analysis

Civiltec acquired and reviewed the land use elements of the General Plans for the City of La Puente, City of Industry and the Los Angeles County Department of Regional Planning in order to determine the planners' vision for development within the LPVCWD water system boundary. ***Civiltec*** summarized and delineated existing land use designations by acreage and number of parcels.

Civiltec acquired and reviewed the latest Southern California Association of Governments (SCAG) Land Use Database for Los Angeles County with regard to those parcels served by LPVCWD. The SCAG Land Use Database uses a Modified Anderson Land Use Classification system, which represents actual and specific land use based on aerial survey.

Water Demand Analysis

Civiltec acquired, reviewed, analyzed, and reconciled customer billing data, water production data and telemetry for the Study Period, as available. This analysis provided an understanding of demand on a pressure zone by pressure zone basis.

Impact of Pending Development (aka Near-Term Development)

An understanding of near-term development is important for determining an appropriate level of developer contribution. In addition to onsite improvements, developers should be responsible for mitigating offsite impacts to the system.

Civiltec contacted the City of La Puente, the City of Industry and Los Angeles County regarding pending development within the existing service boundary.

1.4.2 Establishment of Evaluation Criteria

Early in the planning process, ***Civiltec*** issued a memo detailing proposed Design Criteria and Planning Criteria based on research of previous planning efforts, industry standards, compliance requirements, and input from LPVCWD staff provided at the Kick-Off meeting. ***Civiltec*** coordinated a follow-up meeting with LPVCWD staff to establish and adopt Design Criteria and Planning Criteria to be used as a baseline for determining the adequacy of existing infrastructure to meet current and pending development demands.

Design Criteria

Design Criteria deals with parameters related to the proper sizing and configuration of infrastructure from a hydraulic point of view. The concepts of system performance, system redundancy, customer expectations, regulatory compliance, and emergency preparedness will be built into the criteria, which will target the following areas of concern: supply, storage, transmission, system pressure, and fire flow.

Planning Criteria

Planning Criteria deals with parameters related to cyclical infrastructure replacement due to age and condition. The primary concern of Planning Criteria is to establish the practical service life of each system component and a performance indicator to verify whether maintenance or replacement will result in an economic benefit. These performance indicators may include efficiency, reliability and maintenance history.

1.4.3 Hydraulic Modeling

A hydraulic computer model (Water Model) is an important tool for assessing the distribution system with respect to capacity, compliance, efficiency, and surge. A number of tasks are necessary to construct the new Water Model up to a level where LPVCWD can have confidence in the results it generates, as delineated in the following subsections.

Water Model Construction

- ***Civiltec*** programed all pipes including diameter, length, material, estimated roughness and installation date.
- ***Civiltec*** programed all junctions (i.e. connections between pipe ends) including elevation and designation (e.g. demand node, fire hydrant location, facility, etc.).
- ***Civiltec*** programed all Well and booster pumps including elevation, design head and flow per the latest efficiency test, operational settings, and installation date.
- ***Civiltec*** programed all control valves including elevation, size, and function (i.e. flow control, pressure reducing, pressure sustaining, etc.).
- ***Civiltec*** programed all tanks including base elevation, high water line, dimensions and construction date.
- ***Civiltec*** allocated demand to the nearest demand node based on the water demand analysis.

Steady State Calibration

- Steady state simulation is appropriate for any analysis that may be considered a snapshot in time, such as examining system performance under peak or emergency conditions.

- Steady state calibration involves verifying vertical control (i.e. the elevations of junctions, tanks and facilities) and adjusting pipe roughness to match actual flow characteristics. Following Water Model construction, ***Civiltec*** calibrated it against steady state field data to assure that simulation results reflect actual system performance.

- Field testing was performed at various locations to be determined in coordination with LPVCWD staff (This represents one test in each pressure zone; additional field testing may be performed to improve confidence in the Water Model). A field test consisted of pressure monitoring at two locations before and during a hydrant flow test at a third location. The collected field data at each test location is composed of pressure readings at appropriate locations, pitot tube readings at the flow hydrant, flow test time and duration, flow stream observations (i.e. more or less turbulent), and other boundary conditions that would have an impact on the test result such as tanks levels, pump and valve flow. To the extent feasible, field testing was completed with pumps turned off and gravity storage as the primary source of supply. In cases where there is no gravity storage or where gravity storage is insufficient to support normal operations on its own, telemetry data was used to define the boundary conditions during the test. In the absence of telemetry data at the pressure zone level, a methodology for estimating boundary conditions was devised and applied.

- Estimated roughness was assigned to each pipe in the Water Model based on AWWA[1] and/or Army Corps of Engineers[2] recommendations for pipe material and age. Incremental adjustments were made to the estimated roughness on a global basis until a best fit is achieved. The target tolerance for calibration is plus or minus 5 psi or 5% of static pressure at each test location. The calibration process and the raw field test data is provided in an **Appendix D** in the final WMP report.

Demand Allocation for Simulation

- ***Civiltec*** developed demand allocation to the Water Model across three dimension: (1) scale, (2) simulation type and (3) projection in time. When testing the capacity of the system against design criteria, an appropriate combination of these demand dimension will be applied to the simulation.

- *Scale* was designated as peak hour demand (PHD), maximum day demand (MDD), average day demand (ADD), and minimum day demand (Min Day).

[1] American Water Works Association. (2012). *Manual of Water Supply Practices-M32: Computer Modeling of Water Distribution Systems*.

[2] Walski et al. (1988). *Predicting Internal Roughness in Water Main: EL-88-2*.

- *Simulation type* was designated as Steady State. Steady State means a discrete demand allocated to each demand node.

- *Projection in time* considers (1) existing conditions, and (2) conditions following completion of known development projects (aka near-term).

Scenario Development

- A Water Model scenario is a combination of modeling databases that represents a set of fixed and variable data describing the conditions of a simulation. Scenarios were programmed and stored in the Water Model to simulate conditions described by the design criteria. Simulation results represent system capacity and were compared system requirements in the evaluation process.

- *Fixed data* do not change with time, and are generally described as infrastructure (i.e. the location, alignment, geometry and connectivity of pipes, pumps, valves, tanks and aquifers). The Water Model stores fixed data as Element Databases, and the modeler selects precisely which elements to include in a simulation by defining a Facility Set (i.e. a collection of Element Databases).

- *Variable data* are subject to change with time, including pump or valves settings and controls, demand, supply availability, aquifer depth, etc. The Water Model stores variable data as Data Subsets, and the modeler selects precisely which variable data to include in a simulation by defining a Data Set (i.e. a collection of Data Subsets).

Steady State Simulation

- ***Civiltec*** simulated fire flow under MDD conditions at each hydrant location to determine system capacity relative to the fire marshal's requirements. Care was taken to accurately apply allowances for multiple hydrants providing coverage to commercial, industrial and institutional (CII) areas.

1.4.4 Supply Analysis

Review of Sources of Supply

- ***Civiltec*** defined the supply portfolio serving the needs of LPVCWD based on current agreements, rights and contracts.

- ***Civiltec*** examined alternative sources of supply.

- ***Civiltec*** rated all current and alternative sources of supply in terms of reliability, sustainability and availability.

Future Supply Requirements

- ***Civiltec*** evaluated the capacity of current sources of supply against design criteria under existing and near-term demand conditions.

Supply to Pressure Zones

- ***Civiltec*** evaluated the capacity of current supply to each pressure zone against design criteria under existing and near-term demand conditions.

1.4.5 Facility Analysis

Production Infrastructure

- Production infrastructure generally consists of Wells, raw water transmission pipelines, treatment and imported water connections. ***Civiltec*** evaluated the capacity of production infrastructure against design criteria under existing and near-term demand conditions.

Emergency Supply Infrastructure

- Generally, emergency supply consists of interconnections with neighboring purveyors and secondary connections with wholesalers. ***Civiltec*** identified all sources of emergency supply by source, location, direction of flow, capacity, governing agreements, and historical usage. ***Civiltec*** provided a facility description of each identified emergency supply source.

Booster Pumping Stations

- ***Civiltec*** reviewed pump efficiency tests for all booster pumps and evaluated their current performance relative to the manufacturer's performance curves, as available.

Storage

- The storage analysis focused on the adequacy of existing storage to provide for emergency, firefighting and operational purposes as defined by design criteria under existing and near-term demand conditions.

Pressure Reducing Stations

- Pressure reducing stations that serve as normal sources of supply to a pressure zone or sub-zone were evaluated against design criteria relative to their capacity to deliver the range of expected normal and emergency flows per the continuous and intermittent flow rating the valve or valves in the station under existing and near-term demand conditions.

- Pressure reducing stations that serve as emergency sources of supply were evaluated against design criteria relative to their capacity to deliver emergency flows per the intermittent flow rating of the valve or valves in the station while operating in tandem with other emergency sources under existing and near-term demand conditions.

Treatment and Blending

- ***Civiltec*** reviewed the adequacy of existing treatment and blending facilities operated by LPVCWD with respect to water quality and capacity.

Disinfection

- ***Civiltec*** examined the adequacy of existing disinfection stations with respect to their capacity to maintain a residual throughout the system while operating within the Division of Drinking Water (DDW) parameters.

1.4.6 Distribution System Analysis

Transmission Pipelines

- Transmission pipelines are intended to efficiently transport large volumes of water between facilities. ***Civiltec*** examined the efficiency and capacity of these pipelines to deliver normal flow under existing and near-term demand conditions.

Distribution Pipelines

- Distribution pipelines are intended to deliver water to end users and fire hydrants. ***Civiltec*** examined the efficiency and capacity of these pipelines to deliver normal and emergency flow under existing and near-term demand conditions.

1.4.7 Water Quality Requirements

Assessment of Trends

- ***Civiltec*** analyzed water quality trends that impact the current sources of supply.

Legislative and Regulatory Review

- ***Civiltec*** stays abreast of local, state and federal water quality legislation and regulation through a variety of public policy sources. ***Civiltec*** identified and discussed new and pending water quality legislation and regulation that may impact LPVCWD operations, facilities or policies. ***Civiltec*** identified and described those legislative and regulatory initiatives that may impact LPVCWD.

Legislative and Regulatory Impacts

- Based on our review of new and pending water quality legislation and regulation, ***Civiltec*** described the potential impacts in physical, operational and economic terms.

1.4.8 Planning Analysis

Planning criteria use two factors to identify system components whose replacement would create a net benefit. The first factor is age and is derived from the average historical replacement cycle for a system component. This implies that some components are replaced prior to the average cycle and others last longer than the average cycle. As such, age by itself is insufficient to determine whether a system component should be replaced. The second factor is a performance indicator. As performance drops off, the benefit of replacement increases. A combination of age and performance provides a solid foundation for determining the benefits of replacement.

Replacement Budgeting and Scheduling

- Based on statistical analysis of assets and service life cycle, ***Civiltec*** estimated the frequency and cost of expected equipment and infrastructure replacement for budgeting and scheduling purposes.

Identification of Capital Replacement Projects

- ***Civiltec*** developed a methodology for identifying capital replacement projects for Wells, pipelines, pumps and tanks.

Identification of Cyclical Maintenance Requirements

- ***Civiltec*** developed a methodology for identifying cyclical maintenance requirements for tank coatings, pump overhauls, valve refurbishments, meter replacement and maintenance of other appurtenances.

1.4.9 Capital Improvement Program (CIP)

Cost Estimating Framework

- ***Civiltec*** established a uniform cost estimating methodology suitable for planning purposes. To the extent feasible, the methodology was based on historical records provided by LPVCWD and ***Civiltec***'s experience with related projects.

Identification of Deficiencies

- Based on hydraulic evaluation and cyclical replacement analysis, ***Civiltec*** identified system deficiencies and recommend mitigation as a series of projects and programs. Each project or program was discussed individually and included a description, a justification, a priority, and a cost estimate. As applicable, project descriptions may also include opportunities for synergy, alternative solutions, qualification for alternative funding options, and recommendations for field verification or further study.

Presentation of the CIP

- ***Civiltec*** presents the CIP in tabular form by type in accordance with LPVCWD preferences for organization and budgeting.

1.4.10 Water Conservation

Water Conservation Goal Review

- ***Civiltec*** reviewed the water conservation goals for LPVCWD, the City or any other jurisdiction that may impact water reduction within the water system boundary.

1.5 Abbreviations

The following abbreviation appear in this report:

ADD	average day demand
AFY	acre-feet per year
AF	acre-foot
AWWA	American Water Works Association
BP	Heavy Commercial/Business Park
BPS	booster pump station
CC	Community Commercial
CC&N	certificate of convenience and necessity
CFS	cubic foot per second
CIP	Capital Improvement Project
CIWS	City of Industry Waterworks System
DDW	Division of Drinking Water
DU	dwelling unit
ft	feet
GIS	geographic information system
gpm	gallons per minute
HDR	High Density Residential
HGL	hydraulic grade line
HP	horsepower
HWL	high water line
in	inches
INST	Institutional
L	liter
lbs	pounds
LDR	Low Density Residential
LPVCWD	La Puente Valley County Water District

LWL	low water line
MDD	maximum day demand
MDD+FF	maximum day demand plus fire flow
MDR	Medium Density Residential
MFR	multi-family residential
MGD	millions of gallons per day
MG	milligram
MSGB	Main San Gabriel Basin
MTR	meter
MWD	Metropolitan Water District of Southern California
OS	Open Space
PD	Planned Development
PF	peaking factor
PHD	peak hour demand
PPB	parts per billion
PPM	parts per million
PRV	pressure reducing valve
psi	pounds per square inch
RFI	request-for-information
SCAG	Southern California Association of Governments
SDWA	Safe Drinking Water Act
SFR	single family residential
UDF	unit demand factor
USGVMWD	Upper San Gabriel Valley Municipal Water District
WDF	water duty factor
WMP	Water Master Plan
µg	Microgram

1.6 Conversions

Various units of measure are used for efficient communication of quantities related to and included in engineering calculations. For purposes of consistency, the units referred to in this WMP, their typical usage and their conversions to equivalent units are provided in the sections below.

1.6.1 Volumetric Flow Rate

Volumetric flow rate is presented with a variety of different units depending on context. Volumetric flow rate is generally expressed as a unit of volume per unit of time. The following volumetric flow rate units appear in this report:

Gallons per Minute (GPM)

GPM is commonly used to describe the flow capacity of a pump, valve, fire hydrant or other appurtenances. This unit was used to program the Water Model.

Cubic Foot per Second (CFS)

Metropolitan Water District of Southern California (MWD) typically rates the capacity it its interconnections in terms of CFS. This unit is often used for scientific calculations and for describing the capacity of structures that experience relatively high instantaneous flows (i.e. rivers, weirs, channels, spillways, transmission pipelines, etc.).

Acre-feet per Year (AFY)

When discussing volumetric flow over a long period of time, AFY is often used. Examples of the use of AFY include recharge of an aquifer, seasonal demand associated with agricultural irrigation, the conversion of a snowpack into melt, and management of large surface reservoirs.

Million Gallons per Day (MGD)

Certain facilities are designed to accommodate a daily cycle and include adequate retention to equalize normal fluctuation throughout the day.

Table 1-1 provides conversions for the above volumetric flow rates.

Table 1-1 – Volumetric Flow Rate Conversions

Conversion	GPM	CFS	AFY	MGD
1 GPM equals	1	0.002228	1.613	0.00144
1 CFS equals	448.9	1	724.0	0.6464
1 AFY equals	0.620	0.001381	1	0.000893
1 MGD equals	694.4	1.547	1120.1	1

1.6.2 Volume

Volume is presented with a variety of different units depending on context. The following units of volume appear in this report (with a brief description):

- Gallon – standard U.S. measurement
- Cubic foot (CF) – standard U.S. scientific measurement
- Acre-foot (AF) – typical annual supply measurement

- Liter (L) – scientific measurement in metric

Table 1-2 provides conversions for the above volumes.

Table 1-2 – Volume Conversions

Conversion	Gallon	CF	CCF	AF	L
1 Gallon equals	1	0.1337	0.001337	3.069×10^{-6}	0.2642
1 CF equals	7.481	1	0.01	2.296×10^{-5}	28.32
1 CCF equals	748.1	100	1	0.002296	2,832
1 AF equals	325,872	43,560	435.6	1	1,233,480
1 L equals	3.785	0.03531	0.0003531	8.107×10^{-7}	1

1.6.3 Other Units

Other common units of measure that may be found in this report include:

- Milligrams per liter (mg/L), which is equivalent to parts per million (PPM)
- Micrograms per liter (µg/L), which is equivalent to parts per billion (PPB)
- Pounds (lbs)
- Mile = 5,280 feet
- Foot = 12 inches

1.7 Acknowledgments

We, at **Civiltec engineering inc.**, would like to express our appreciation for the cooperation and valuable assistance of the LPVCWD management and staff. In particular, the efforts of the following individuals proved to be invaluable:

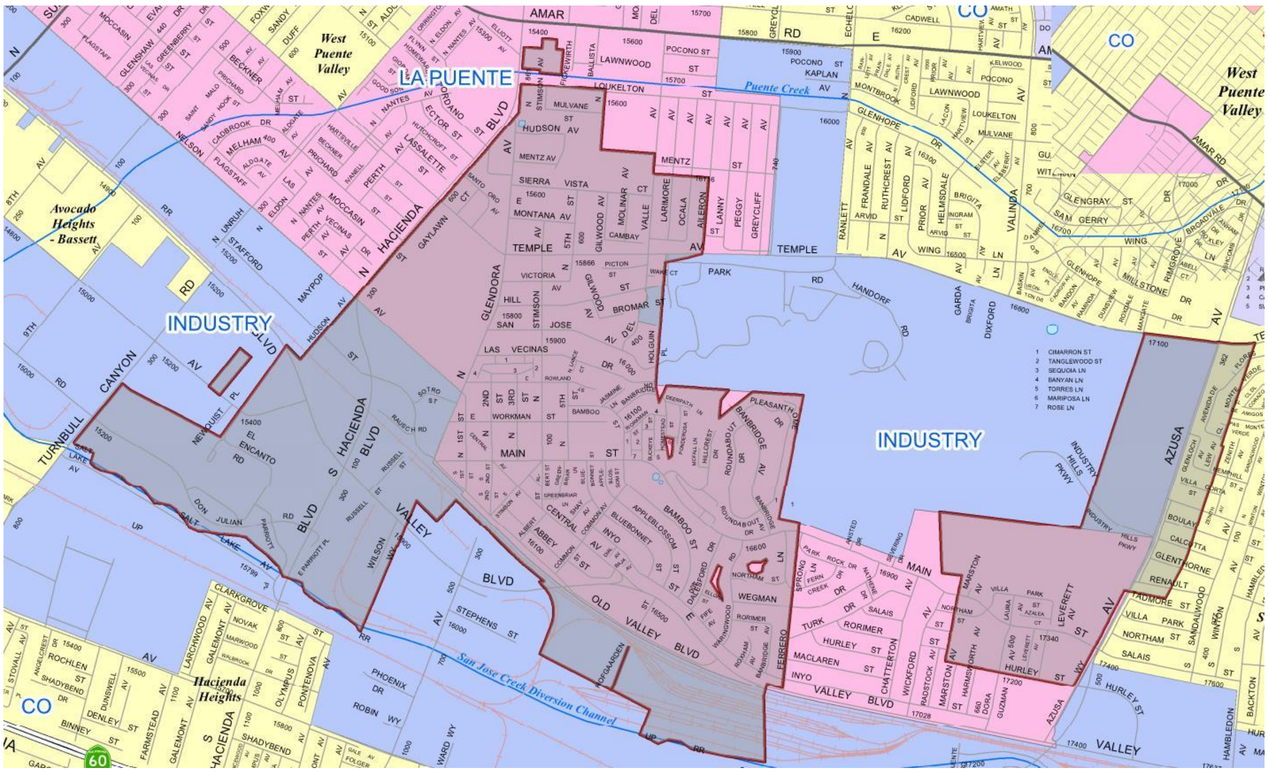
- Greg Galindo – General Manager
- Cesar Oritz – Water Production & Treatment Supervisor
- Roy Frausto – Compliance Officer / Project Engineer

CHAPTER TWO – LAND USE & WATER REQUIREMENTS

2.1 General Description

Chapter 2 summarizes the context for Land Use planning as it influences LPVCWD. LPVCWD serves portions of the City of La Puente and City of Industry, as well as unincorporated portions of Los Angeles County. The boundary map of the service area is provided in **Figure 2-1.**

Figure 2-1 – Boundary Map LPVCWD



2.2 Land Use Analysis

Land use within LPVCWD's service area in the City of La Puente is primarily residential with some commercial, institutional and open space areas. In the City of Industry, demand is primarily commercial and industrial. Within the unincorporated areas of Los Angeles County, land use is primarily residential.

The LPVCWD's service area in the City of Industry is believed to be fully build out. Therefore, when considering potential growth rates for the LPVCWD as a whole, the population of the City of La Puente is used as a key indicator. The population of La Puente has fluctuated minimally since the year 2000. During the 14-year period of 2000-2014, the city's total population has decreased by 1.4% from 41,063 to 40,478.[1]

[1] 2015 SCAG Profile of the City of La Puente http://www.scag.ca.gov/Documents/LaPuente.pdf

2.3 Pending Development

On January 22, 2016, the Planning Division of La Puente began reviewing an application of future development (Plan Development Permit, Agreement and Tentative Tract Map) for a 4.5-acre lot consisting of 45 detached single family homes at 747 Del Valle Avenue. [2]

2.4 Water Demand

Water production capacity must be capable of satisfying all water demands and water losses. Water demands are considered to be the sum of all water delivered to customers and billed for at a commodity rate. Water losses include water uses whose revenue cannot be recovered through activities such as water quality sampling, flushing, pumping to waste, hydrant testing, fire suppression, unmetered construction water and street cleaning water. Water losses also include other forms of unaccounted water such as leaks, reconciliation of inaccurate meters, unauthorized uses, pipe breaks and undocumented maintenance.

For purposes of this Water Master Plan, the term water demand refers to the level of water production necessary to satisfy customer demands and typical losses. Water losses are not referred as a separate category or water use; rather, they are considered a functional reality of managing a distribution system that must be considered when projecting requirements and recommending improvements.

An understanding of demand fluctuation is key to appropriate sizing of infrastructure and facilities. The following sections provide analysis of steady state and dynamic demand fluctuation.

As of 2015, the LPVCWD had 2,568 service connections consisting of 2,058 residential, 400 commercial, 12 industrial, and 98 irrigation service connections.[3]

2.4.1 Current Water Demand

From 2010 to 2016, the average yearly water usage was approximately 1,691.66 AF. For the years 2010 through 2016, the annual water use data, as provided by LPVCWD, are shown in **Table 2-1**. From 2010 to 2014, water usage increased due to population increase and other elements; however, the usage decreased in 2015 and 2016 as a result of emergency water conservation measures.

[2] Planning Division of City of La Puente

[3] LPVCWD 2015 Annual Report to the State Drinking Water Program LPVCWD

Table 2-1 – Current Water Demand

Year	Water Use (AFY)	Water Use (gpm)
2010	1,609.06	996.89
2011	1,736.83	1,076.05
2012	1,773.61	1,098.84
2013	1,934.91	1,198.77
2014	1,868.42	1,157.58
2015	1,484.08	919.46
2016	1,434.70	889.46
Average	1,691.66	1,069.60

2.4.2 Steady State Peaking Factors

For planning purposes, there are three steady state conditions of interest: (1) Average Day Demand (ADD), (2) Maximum Day Demand (MDD) and (3) Peak Hourly Demand (PHD). The values of these peaking factors are calculated in the following chapters of the Water Master Plan.

Calculation of Average Day Demand

Utilizing the procedures for determining ADD as outlined by the California Regulations Related to Drinking Water, §64554 (b) (3), the average water usage between 2010 through 2016 was averaged to yield an ADD of 4.63 AF.

ADD serves as a benchmark and a planning tool for long-term issues at the system level, such as supply acquisition and integrated resources management.

Calculation of MDD and PHD Peaking Factors

MDD serves as a planning tool at the pressure zone level. MDD is the peak loading for typical booster-reservoir pressure zones for analysis of supply requirements. The maximum day demand was calculated using data provided by LPVCWD between 2010 through 2016. The average MDD of these years is 10.23 AF. The peaking factor is the ratio of the MDD to ADD (2.21).

In large pressure zones, the demographic diversity of the connections creating the demand tends to mediate the degree of variation between ADD and MDD. For example, in Zone 1 of the LPVCWD system (the largest zone), the standard peaking factor of 2.21 can be considered adequate for planning purposes. However, in smaller zones such as Zone 5, with just 10 connections, user demographics tend to be much less diverse, and MDD can vary much more significantly, sometimes by as much as a factor of 8.

MDD is also used to help define certain emergency conditions, especially MDD plus Fire Flow.

PHD serves as a planning tool at the pipe level. Pipes must function adequately under this loading. Also, PHD is the peak loading for sub-zones (e.g. Zones 1A and 2A) for analysis of supply requirements.

A peaking factor is the ratio of the target demand to ADD (3.31). Peaking factors were derived by analyzing data to develop an understanding of pressure zone level demand, sorting for the peak day and peak hour, and scaling to account for the historical peak month production and for attenuation. **Table 2-2** summarizes an analysis of actual water use data during the study period.

Table 2-2 – Peaking Factors

Demand Condition	Code	MGD	GPM	PF
Average Daily Demand	ADD	1.55	1,075	1.00
Maximum Daily Demand	MDD	3.42	2,373	2.21
Peak Hour Demand	PHD	5.13	3,559	3.31

2.4.3 Future Water Demand

Over the past 20 years, the number of service connections increased at an average rate of approximately 1% per year. This growth rate is based on the similar growth rates identified in the LPVCWD's historic number of service connections and the projected long-term growth rate in the City of La Puente. The future water demand over the next 20 years, including ADD and MDD, is shown in **Table 2-3**.

Table 2-3 – Existing and Future Water Demand

Year	Water Use (AFY)	ADD (gpm)	MDD (gpm)
2015	1,735	1,075	2,373
2020	1,822	1,129	2,492
2025	1,914	1,186	2,617
2030	2,010	1,245	2,748
2035	2,110	1,307	2,885
Increase	375	232	512
% Increase	21.6 %		

The LPVCWD system is composed of 5 different water pressure zones. The future ADD water use in AFY by each pressure zone will be utilized for future urban planning, infrastructure improvements, facility improvements, and so on. The future water use within LPVCWD's pressure zones over the next 20 years is shown in the **Table 2-4**. In addition, future ADD and MDD water use presented as gpm within LPVCWD's pressure zones over the next 20 years is shown in **Table 2-5**.

Table 2-4 – Future LPVCWD Water Use by Zones (AFY)

Year	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Total
2015	1,161	499	28	41	6	1,735
2020	1,219	523	30	43	7	1,822
2025	1,280	550	32	45	7	1,914
2030	1,345	578	33	47	7	2,010
2035	1,412	606	35	49	8	2,110

Table 2-5 – Future ADD and MDD by Zones (gpm)

Scenario	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Total
2015						
ADD	719	309	18	25	4	**1,075**
MDD	1,588	682	38	56	9	**2,373**
2020						
ADD	755	325	19	26	4	**1,129**
MDD	1,667	716	41	59	9	**2,492**
2025						
ADD	793	340	20	28	5	**1,186**
MDD	1,751	752	43	61	10	**2,617**
2030						
ADD	833	357	21	29	5	**1,245**
MDD	1,838	790	45	65	10	**2,748**
2035						
ADD	874	375	22	31	5	**1,307**
MDD	1,930	829	48	68	11	**2,886**

Based on the water use data between 2010 and 2016, the percentage of water use per each pressure zone is presented in **Table 2-6.**

Table 2-6 – Water Usage Percentage of Each Zone

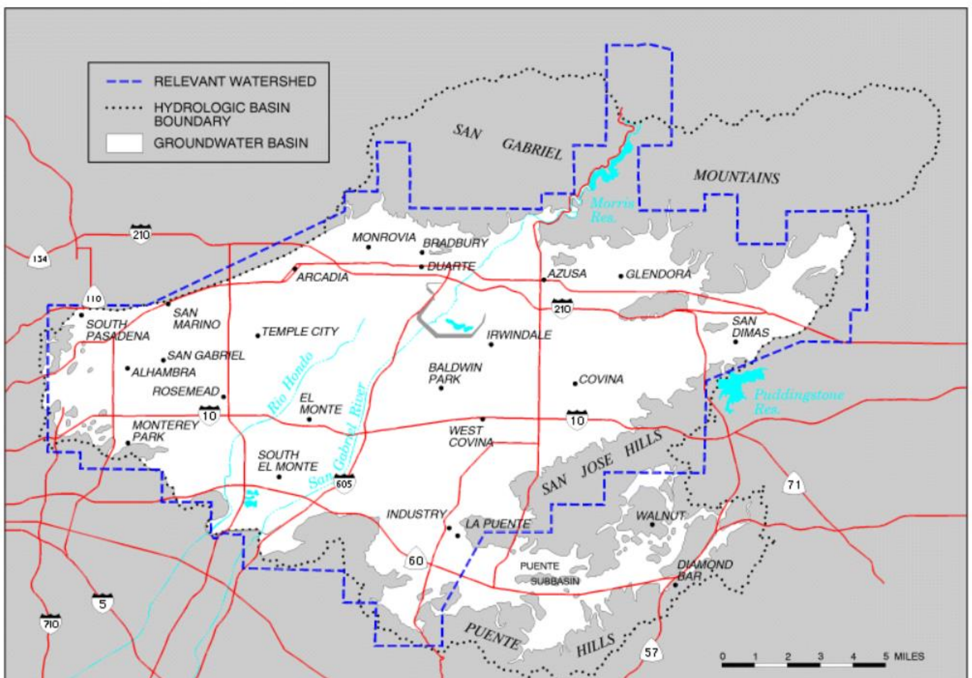
Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Total
66.9 %	28.7 %	1.68 %	2.34 %	0.38 %	100 %

CHAPTER THREE- SOURCES OF SUPPLY

3.1 General Description

LPVCWD's preferred non-emergency source of supply is from three groundwater Wells that produce water from the adjudicated Main San Gabriel Basin (MSGB). The Main San Gabriel Groundwater Basin is bounded by the San Gabriel Mountains to the north, San Jose Hills to the east, Puente Hills to the south, and by a series of hills and the Raymond Fault to the west. The boundary map of MSGB is provided in **Figure 3-1**. The watershed is drained by the San Gabriel River and Rio Hondo, a tributary of the Los Angeles River. Surface area of the groundwater basin is approximately 167 square miles. The fresh water storage capacity of the basin is estimated to be about 8.6 million acre-feet[1]

Figure 3-1 – The Boundary Map of MSGB



Source: Main San Gabriel Basin Watermaster website (http://www.watermaster.org/basinmap.html)

3.2 Water Rights and Agreements

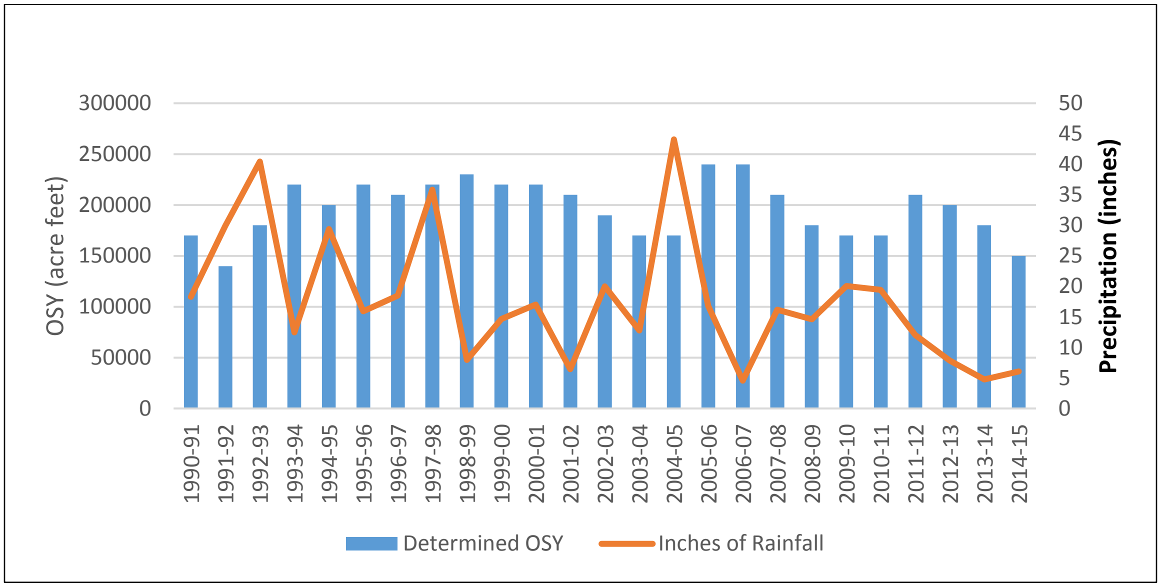
On January 4, 1973, LPVCWD was adjudicated 1,097.00 acre-feet of water rights based on groundwater production that occurred between calendar years 1953 and 1967, inclusive. Subsequently, LPVCWD obtained the water rights of El Encanto Properties on July 22, 1974, in the amount of 33.40 acre-feet. Thus, LPVCWD's total adjudicated water rights were set at 1,130.40 acre-feet (0.57197%) of all adjudicated water rights in the Basin. Amendments to the adjudication were approved on June 21, 2012. The amendments worked to expand conjunctive

[1] Main San Gabriel Basin Watermaster Annual Report 2014-2015 **Appendix B** Page B2 of 6

use of groundwater and surface water for future use, to enhance long-term sustainability of water supplies. The Amended Judgement, including a list of adjudicated water rights, is included as **Appendix A.**

Over time, as rainfall has fluctuated, the MSGB Watermaster has adjusted the Operating Safe Yield (OSY) accordingly. Data for the last 25 years can be seen in **Figure 3-2**[2].

Figure 3-2 – Rainfall Precipitation (in)



The OSY for 2015-2016 is currently set at 150,000 AF. LPVCWD's 0.57197% of this total is equal to 857.955 AF.

Utilizing the Metropolitan Water District of Southern California (MWD) distribution system, the Upper District provides water to the MSGB Watermaster[3].

3.2.1 Alternative Sources

LPVCWD maintains 11 interconnections with surrounding water purveyors. Nine (9) of these interconnections provide emergency backup supply to LPVCWD and provide the surrounding purveyors with emergency backup supply. When LPVCWD's Wells are down for maintenance or other reasons, LPVCWD receives water from adjacent water purveyors via these interconnections. Currently, there is only a single 8-inch pipeline that connects the eastern portion of LPVCWD's distribution system (Zone 2) with LPVCWD's treated water supply. Interconnections from City

[2] Main San Gabriel Basin Watermaster Report on Preliminary Determination of Operating Safe Yield For 2015-16 Through 2019-20

[3] http://upperdistrict.org/about/service-area/

of Industry and Rowland Water District (RWD) provide the backup supply to the eastern portion of LPVCWD. The information of alternative source is provided in **Table 3-1**.

Table 3-1 – Location of Alternative Sources

Connection	From - To	Type	Size	Zone Served	Capacity (gpm)	Status
Suburban Water Systems N. Hacienda Blvd. & Loukelton St.	SWS - LPVCWD	Groundwater	6”	Zone 1	700	Active
Suburban Water Systems Azusa Way & Hurley St.	LPVCWD - SWS	Groundwater	6”	Zone 2	500	Emergency
San Gabriel Valley Water Co. Don Julian Rd. & Turnbull Canyon Rd.	SGVWC - LPVCWD	Groundwater	8”	Zone 1	1,200	Active
San Gabriel Valley Water Co. Proctor Ave. & El Encanto	SGVWC - LPVCWD	Groundwater	8”	Zone 1	800	Active
Rowland Water District Azusa Way & Hurley St.	RWD - LPVCWD	Surface Water	8”	Zone 2	700	Emergency
City of Industry Waterworks System San Jose Ave. & Holguin Place	CIWS - LPVCWD	Groundwater	4”	Zone 5	500	Active
City of Industry Waterworks System San Jose Ave. & Holguin Place	CIWS - LPVCWD	Groundwater	12”	Zone 2	1,600	Active
City of Industry Waterworks System Industry Hills-Pump Stat. 1 (Hill St.)	LPVCWD - CIWS	Groundwater	12”	Zone 1	1,600	Emergency
City of Industry Waterworks System Ind. Hills-Pump Stat. 3 (Industry Hills Pkwy.)	CIWS - LPVCWD & LPVCWD - CIWS	Groundwater	10”	Zone 2	1,600	Active
City of Industry Waterworks System Valley Blvd. & Proctor Ave.	CIWS- LPVCWD & LPVCWD - CIWS	Groundwater	14”	Zone 1	1,600	Active
City of Industry Waterworks System Pleasanthome Drive & Industry Hills Reservoir	CIWS - LPVCWD & LPVCWD - CIWS	Groundwater	8”	Zone 3	1,600	Active

3.3 Water Reliability, Sustainability, Availability

The reliability, sustainability and availability of LPVCWD's water is directly dependent upon a wide network of sources.

When LPVCWD requires more water than its annual production rights, they are able to pump over the established water rights by leasing water rights from other stakeholders with the notice to the MSGB Watermaster. Also, the deficit water can be purchased from imported water. If LPVCWD pumped over the established water rights without leasing or purchasing from other water sources, then it will be charged through the assessment invoice from the MSGB Watermaster and that fee will be used to fill up the deficit of water from imported water sources.

In 2013-14, MWD doubled its annual conservation and outreach budget from $20M to $40M and called on its retail water agencies to implement "extraordinary conservation measures" to reduce water demand. In the 2013-14 fiscal year, the region saved about 923,000 AF of water.[4] MWD also actively supports multiple recycling and groundwater recovery programs to balance the region's water portfolio.

From 2011 to 2014, each year has been dryer than the previous year.

In 2013-14, the MSGB Watermaster set new OSY levels to help encourage conservation and continued to make progress towards building regional water supply independence as follows:

- Established a Reliability Storage Program with a target reserve of 100,000 acre-feet
- Implemented a new Water Resource Development Assessment to pay for the Reliability Storage Program
- Paved the way for importing Colorado River water into the Basin, providing additional supplies
- Set new OSY levels that will help encourage water conservation
- Expanded outreach efforts to improve consumer conservation
- Continue to make progress on groundwater cleanup and water quality protection project

LPVCWD acquired services from Montgomery Watson Harza Americas, Inc. (MWH) to produce a recycled water feasibility study that was completed in May 2011. LPVCWD's potable groundwater sources currently pump over its annual allotment by approximately 40%, thereby requiring them to pay replenishment fees to the MSGB Watermaster. A total of 74 reuse sites with a demand of 375 AFY in and adjacent to its service area within the City of Industry were identified. The feasibility study identified four (4) Alternatives for providing recycled water to LPVCWD's service area. Of the 4 alternatives, Alternative 2 (Pumped System) was the recommended recycled

[4] http://www.mwdh2o.com/PDF_About_Your_Water/2.1.1_Regional_Progress_ReportSB60.pdf

water system design. The recommended design utilizes the City of Industry's 36-inch recycled water transmission line as the source of supply for the system. This alternative includes tapping into the 36" transmission line along the San Jose Creek Channel at Parriot Place that could serve approximately 280 AFY to identified customers through a new pump station.

The construction of a recycled water system will require the District, for the first time in several decades, to obtain a loan to finance such a project. The investment in a recycled water system will deliver recycled water to several irrigation customers and replace the use of drinking water for irrigation. The current drought has made it clear that reliance on imported water for groundwater replenishment is not the best long-term solution for the regions' water supply needs. By incorporating recycled water into the District's overall supply, the District would reduce its dependence on this expensive water source.

The District has partnered with Upper San Gabriel Valley Municipal Water District to secure a $428,000 grant from the State Department of Water Resources for Phase 1 of the Recycled Water System Project. This grant will cover approximately 25 percent of the estimated cost of Phase 1, which is expected to serve 50 acre feet of recycled water per year to irrigation customers on Don Julian Avenue. Phases 2 and 3 are planned to deliver an additional 140 acre feet per year. The current cost to produce 190 acre feet of water that is over the District's annual production right is approximately $170,000. The overall cost of all 3 Phases is estimated at $7.5 million. The District is pursuing low interest loans and any available grant funding to fund this project that would otherwise not be cost effective. This new drought resistant source of water improves long-term water supply reliability for all the District's customers. For purposes of the 10-year Capital Improvement Program (CIP) budgeting allocations (Chapter 9 – Table 9-21), Phase 1 will be the only Phase included on the list of Capital Projects. Phase 2 and Phase 3 will be reviewed and analyzed further by LPVCWD staff to determine the feasibility of constructing during the next 10 years.

3.4 Supply to Pressure Zones

LPVCWD maintains five separate pressure zones as shown in **Figure 3-3**. **Table 3-2** below summarizes the basic features of the five zones.

Table 3-2 – Ground Elevation Range of Pressure Zones

Zone	Elevation (ft AMSL)	
	Low	High
1	307	442
2	378	541
3	536	690
4	453	630
5	557	568

In 2015, four zones were partially serviced with water purchased from outside LPVCWD. **Table 3-3** below list the source, size, capacity, and status for each respective zone.

Table 3-3 – Zones Capacity

Zone	Source(s)[5]	Size (inch)	Capacity (gpm)	Status
1	SWS	6	700	Active
	SGVWC	8	1,200	Active
	SGVWC	8	800	Active
	CIWS	12	1,600	Emergency
	CIWS	14	1,600	Emergency
2	RWD	8	700	Emergency
	CIWS	10	1,600	Emergency
	CIWS	12	1,600	Active
3	CIWS	8	1,600	Active
5	CIWS	4	500	Active

Based on system theory, supply to a pressure zone is defined as Q_{in}. For purposes of analysis, supply as Q_{in} is considered as the sum of all non-emergency sources entering a pressure zone, including Wells, treatment facilities, booster stations, and control valves. We will evaluate the capacity of current supply to each pressure zone against design criteria under existing and near-term demand conditions. Accordingly, each element of the water supply, storage, production, interconnection and distribution systems will be evaluated for necessary improvements to address deficiencies under the current and near-term conditions in Chapter 9.

[5] SWS – Suburban Water Systems
SGVWC – San Gabriel Valley Water Company
CIWS – City of Industry Water System
RWD – Rowland Water District

Figure 3-3 – Boundary of Pressure Zones in LPVCWD

CHAPTER FOUR- WATER QUALITY

4.1 General Description

Chapter 4 details the status and potential impacts of water quality on the LPVCWD.

The United States Environmental Protection Agency (EPA) and the Division of Drinking Water (DDW) are the public agencies responsible for drafting and implementing regulations that ensure drinking water is safe to consume. EPA and DDW establish drinking water standards that limit contaminant concentrations in water provided to the public.

LPVCWD regularly tests its drinking water using approved methods to ensure its safety. Over 100 compounds are monitored in LPVCWD's water supply and detected constituents are reported accordingly. In 2015, all water delivered by LPVCWD met or surpassed State and Federal drinking water standards.

In addition, the MSGB Watermaster, who manages the groundwater basin where LPVCWD extracts its supply, continuously and vigilantly reviews upcoming State and Federal drinking water regulations. MSGB Watermaster has been proactive in the monitoring of unregulated emerging contaminants in anticipation of new water quality standards.

4.2 Consumer Confidence Report

Water utilities in California have been required to provide an annual report to their customers since 1991, which summarizes the prior year's water quality and explains important issues regarding their drinking water. In 1996, the United States Congress reauthorized the Safe Drinking Water Act (SDWA), which was originally passed in 1974 and later amended in 1986. The 1996 reauthorization called for the enhancement of nation-wide drinking water regulations to include important components such as source water protection and public information. The LPVCWD 2015 Water Quality/Consumer Confidence Report was prepared in compliance with the consumer right-to-know regulations required by the SDWA 1996 amendments and is provided in **Appendix C**.

4.3 Safe Drinking Water Act

The federal government, with the passage of the Safe Drinking Water Act (U.S. Congress, 1974) through the EPA, was given the authority to set drinking water quality standards for all drinking water delivered by community (public and/or private) water suppliers. The SDWA requires two types of standards: primary and secondary. Primary standards are enforceable and intended to protect public health, to the extent feasible, using technology, treatment techniques, and other means, which the EPA determines are generally available on the date of the enactment of the SDWA. Primary standards include performance requirements (Maximum Contaminant Levels, or MCL's) and/or treatment requirements. The SDWA also contains provisions for secondary drinking water standards for MCLs on contaminants that may adversely affect odor or appearance of water. Secondary standards are not enforceable.

The SWDA has established processes for identifying and regulating drinking water contaminants to protect human health. The Candidate Contaminant List and the Unregulated Contaminant Monitoring Rule are scientifically rigorous processes for determining the appropriate status of currently unregulated contaminants. Regulations regarding these processes were enacted by amendment to the SDWA in 1996 to address emerging constituents.

4.4 Current and Pending Water Quality Related Legislation

Changes to water quality regulations and standards and the review of legislation is closely monitored by numerous stakeholders including EPA, DDW and AWWA. The following sections provide a summary of pressing issues cited by these agencies that may impact LPVCWD.

4.4.1 Hexavalent Chromium

Hexavalent chromium, also known as chromium 6, is the subject of significant developments at the state and federal levels. Though there are currently no existing or proposed drinking water standard specifically targeting chromium 6, the California Office of Environmental Health Hazard Assessment has proposed a public health goal of 0.02 parts per billion (20 parts per trillion) in July 2011. DDW proposed an MCL for chromium 6 of 0.010 milligram per liter (10µg/L) and announced the availability of the proposed MCL for public comment. DDW reviewed the comments submitted by interested parties and responded to them in the final statement of reasons. On April 15, 2014, DDW submitted the hexavalent chromium MCL regulations package to the Office of Administrative Law (OAL) for its review for compliance with the Administrative Procedure Act. On May 28, OAL approved the regulations, which were effective on July, 2014. The EPA and members of Congress have signaled their intent to focus on chromium 6 in drinking water. It should be noted that chromium 6 is currently indirectly monitored under the total chromium MCL of 50µg/L at the state level and 100µg /L at the federal level.

4.4.2 Impacts of Climate Change

Climate change has the potential to affect the reliability of both local and imported water supplies, and adds its own uncertainties to the challenges of planning. Climate change could also increase water demand. For example, studies conducted by the National Center for Atmospheric Research for Inland Empire Utilities Agency, suggest a 0.21 to 3.81 degrees F temperature increase and -19 to +8 percent change in winter precipitation in Southern California between 2000 and 2030 (Groves, Knopman, Lempert, Berry, & Waifan, 2008). Studies conducted by the Southern California Association of Governments (SCAG) suggest that current temperatures will increase by 1 to 2 degrees F by 2050, and by 4 degrees F above current levels by 2100 (Governments, 2009). Higher temperatures and reduced precipitation are expected to increase evapotranspiration and irrigation water demands; however, higher temperature may also result in increased humidity which could offset a portion of the demand increase. Reliability estimates developed by the California Department of Water Resources (DWR) for the State Water Project (SWP) supplies account for the impacts of climate change.

Traditional planning methods assume that future hydrologic conditions will be representative of past conditions (from early 1900s). However, as demonstrated by current weather patterns, future climate and hydrologic conditions may differ from past observations due to climate change and extremities of climate variation that have recently manifested. In addition to climate change and natural variation, other uncertainties such as population projections and unforeseen regulatory changes, may pose risks to resource management strategies that assume the status quo.

It is important to make a distinction between climate and weather. Climate is how the atmosphere behaves in an area over a long period of time, while weather is the state of the atmosphere over a short period of time.

Climate change was once considered an issue for a distant future but now has moved into the present. It can be defined as a change in global or regional climate patterns primarily due to human-induced emissions of heat-trapping gases.

According to the 2014 National Climate Assessment (NCA), "climate change is already affecting American people in far-reaching ways. Certain types of extreme weather events have become more frequent and/or intense, including prolonged periods of heat, heavy downpours, and, in some regions, floods and droughts. In addition, warming is causing sea level to rise and glaciers and Arctic sea ice to melt, and oceans are becoming more acidic as they absorb carbon dioxide".[1]

Climate change is expected to affect California's water supply conditions, with one of the most significant impacts being reduction in mountain snowpack due to warmer temperatures that will likely increase evapotranspiration rates and extend growing seasons.

Per the 2010 California Drought Contingency Plan[2], regions that rely heavily upon surface water or surface water recharge could be particularly affected as runoff and surface water supply becomes more variable, and more demand is placed on groundwater and availability for surface water for groundwater recharge is limited. Climate change and a projected increase in California's population will also affect water demand. Southern California entered a drought state in 2012 throughout 2016.

The impact of climate change on LPVCWD is unknown at this time, but it may cause a decrease in available supplies and an increase in demand. It is recommended to maintain a dialogue with local jurisdictions, the County of Los Angeles and the State of California on the subject of climate change regulation.

4.4.3 Electronic Dissemination of Consumer Confidence Reports (CCR)

SDWA requires public drinking water system administrators to electronically post water quality reports to all customers on an annual basis. The US Senate enacted the "End Unnecessary Costs Caused by Report Mailing Act of 2011" (S.1578, HR.1340) intended to increase the efficiency of required correspondence by utilizing modern communications technology. As a result, LPVCWD utilizes electronic communication of water quality reports. California water purveyors are currently able to electronically submit the CCR as of 2013.

[1] "Highlights". Climate Change Impacts in the United States. U.S. National Climate Assessment.
[2] California Drought Contingency Plan 2010. California Department of Water Resources.

4.4.4 "Safe Harbor" for MTBE

The US House of Representative is considering the "Domestic Fuels Protection Act" (HR.4345) whose provisions would allow polluters to pass on to communities and their customers the cost of cleaning up drinking water sources contaminated by MTBE (methel tertiary-butyl ether). This issue of "safe harbor" for contamination by MTBE came up previously, and the House and Senate ultimately did not include such provisions in the comprehensive energy bill enacted in 2005.

If MTBE is present in LPVCWD groundwater, LPVCWD may become responsible for its cleanup. It is recommended LPVCWD monitor legislation regarding the issue regarding MTBE cleanup.

4.4.5 EDCs and Pharmaceuticals

There are increasing concerns over the detection of endocrine-disrupting compounds (EDCs) and other pharmaceuticals in water. Per AWWA, both non-point source runoff and sewage effluent from properly operated waste treatment plants may contain minute traces of these compounds. Some minute quantities of these products will pass through animals and humans who use them, and enter the waste stream. They are typically not completely destroyed or removed by wastewater treatment processes. The concern does not stem from the detected concentrations of these compounds, but from their mere existence. As detection instruments become more and more sensitive, extremely low concentrations of constituents in water can be detected. Modern devices are now able to detect compounds at the parts-per-trillion level, and are breaching the parts-per-quadrillion boundary in some cases. To date, however, no concentrations of EDCs or pharmaceuticals have been detected which pose a health risk. Research is ongoing.

The impact on LPVCWD is unknown at this time. It is recommended LPVCWD monitor legislation regarding potential development of MCLs for EDCs.

4.4.6 Groundwater Replenishment Reuse

DDW has proposed updated regulations for groundwater replenishment with recycled municipal wastewater (See **Appendix B**). These regulations would provide guidance, standards and requirements for the implementation of a Groundwater Replenishment Reuse Project (GRRP). A GRRP sponsor would be responsible for demonstrating project feasibility, compliance and monitoring.

These regulations may impact the conclusions of the feasibility study being undertaken by Upper San Gabriel Valley Municipal Water District (USGVMWD) regarding its Indirect Reuse Groundwater Replenishment Project, per U.S. Dept. of the Interior:

> The USGVMWD will investigate and seek solutions to reverse diminishing groundwater supplies in the main San Gabriel Basin. The objective is to offset current interruptible imported supplies with 10,000 to 20,000 acre-feet annually of locally supplied recycled water within the next 8 to 13 years. The feasibility study will evaluate multiple sources of reclaimed water and compare these alternatives

against a "no project" alternative in order to determine the best method for replenishment for the study area.

LPVCWD may have an opportunity to participate as member agency in the USGVMWD project, depending on the outcome of the study.

MWD under partnership with the Sanitation Districts of Los Angeles is also currently exploring the potential of a water purification project to reuse water currently discharged to the Pacific Ocean for recharge of regional groundwater basins in Los Angeles and Orange counties. MWD would construct a new purification plant and distribution lines to groundwater basins. The operational phases of the project could call for deliveries of up to 150 MGD of purified water and the construction of about 60 miles of distribution lines to convey the water to spreading basins and/or injection Well sites in both of the counties. [3] This project would be the first in-region production of water by MWD and may beneficially impact LPVCWD supply with recharge extending to the Main San Gabriel Basin.

4.5 Local Contamination

In 1991, the levels of volatile organic compounds (VOCs) in the LPVCWD Wellfield began to exceed the maximum contamination levels set by the DDW. In 1997, several new chemicals not previously identified as concern (including perchlorate, NDMA, and 1,4-dioxane) were discovered in the District's Wellfield. These contaminants are treated through the La Puente Treatment Plant. The summary of water quality data for Well 2, 3 and 5 is described in **Table 4-2**.

The concentration trend (2012 to 2016) of these contaminants in the raw water (Well Nos. 2, 3 and 5) is described in **Table 4-1**.

Table 4-1 – Trend of Water Quality

Contaminants	Well 2	Well 3	Well 5
TCE	Decreasing	Decreasing	Decreasing
PCE	Constant	Decreasing	Decreasing
CTC	Decreasing	Decreasing	Decreasing
1,2 DCA	Constant	Decreasing	Decreasing
Perchlorate	Constant	Decreasing	Constant
Nitrate	Increasing	Increasing	Constant
NDMA	Constant	Decreasing	Decreasing
1,4 Dioxane	Increasing	Decreasing	Decreasing

[3] The Metropolitan Water District of Southern California, Regional Recycled Water Program

The average raw water contaminant concentration levels in 2015-2016 with their respective MCL/NL for Wells No. 2, No. 3, and No. 5 are listed in **Table 4-2**.

Table 4-2 – Average Water Quality and MCL/NL

Contaminants	Well 2	Well 3	Well 5	MCL/NL
TCE	55.5 ug/l	0.82 ug/l	13.7 ug/l	5 µg/L
PCE	3.3 ug/l	ND	1.1 ug/l	5 µg/L
CTC	2.7 ug/l	ND	0.5 ug/l	0.5 µg/L
1,2 DCA	2 ug/l	ND	0.4 ug/l	0.5 µg/L
Perchlorate	39 ug/l	7.9 ug/l	15.9 ug/l	6 µg/L
Nitrate (As Nitorgen)	6.7 mg/l	8.1 mg/l	6.5 mg/l	10 mg/L
NDMA	91.7 ng/l	ND	26.4 ug/l	*10 µg/L
1,4 Dioxane	1.6 ug/l	ND	0.2 ug/l	*1 µg/L

ND = Non Detect
MCL = Maximum Contaminant Level
* Notification Level (NL)

4.6 Current Water Treatment

The La Puente Treatment Plant, located at 1695 Puente Avenue in the City of Baldwin Park, was completed in February of 2000. This treatment facility includes the following elements to treat groundwater from Wells No. 2, No. 3, and No. 5:

- Two parallel air stripping towers with off-gas carbon for treating VOCs.
- An ion exchange (4 vessels) for treating perchlorate.
- A hydrogen peroxide injection system and two Ultraviolet light/oxidation systems in parralel for treating NDMA and 1,4- dioxane.
- Two booster pump stations.

The layout and flow diagram of La Puente Treatment Plant is shown in **Figure 4-1** and **Figure 4-2**.

After treatment, the water is piped to the District's Hudson Booster Station located in the City of La Puente and pumped into the District's water system. The water is closely monitored and tested to assure that the water delivered to the public complies with all Federal and State drinking water regulations. The Treatment Plant current capacity is 2,500 gallons per minute, meeting 100% of the District's water needs.

4.7 Puente Valley Operable Unit Intermediate Zone Project

The District prides itself on its efforts over the past 25 years to provide groundwater cleanup (treatment) in the Main San Gabriel Groundwater Basin. In fact, the District was the first water agency in the San Gabriel Valley to provide multi-barrier treatment for various contaminants at its groundwater treatment facility, which kick started other groundwater treatment projects in the Valley. Over the years, the District's groundwater treatment plant has removed tons of contaminants. Our District's overall goal is to leave the groundwater basin free of contamination for future generations, so that it may continue to be used to meet the needs of its residents.

In mid-2014, the District was presented with an opportunity to further make a difference in remediating groundwater contamination in the Main San Gabriel Basin, more specifically the Puente Valley area. Under an order by US EPA, several industrial companies have been planning for several years to construct a highly efficient groundwater treatment system. This system would be comprised of 50 monitoring Wells, 7 production Wells, and multiple treatment technologies. In 2015, a property was purchased, by the lead industrial company, to construct the groundwater treatment facility. This property is located within the District's service area and in close proximity to the District's water distribution facilities. Since District staff already has experience operating a similar groundwater treatment system, the District has agreed to operate the Puente Valley Operable Unit Intermediate Zone (PVOU IZ) treatment facility. The District will receive fully treated water, which meets all State and Federal drinking water standards, into its water system and will utilize this water as a back-up supply for the District and for neighboring water purveyors.

In November 2014, the District and the lead industrial company signed a Term Sheet to move forward with plans for the District to operate and deliver water from the proposed groundwater treatment plant. The plant will need to be operated on a continual basis and any surplus water in excess of the needs of the District will be conveyed to another neighboring Water Agency. The plant will improve water quality in the groundwater basin, provide an additional emergency water supply for the community of La Puente, and create an additional revenue source for the District. The groundwater treatment system and associated improvements are anticipated to be constructed over the next two to three years with groundwater treatment starting in 2019/2020.

Figure 4-1 - Layout of LPVCWD Water Treatment Facility

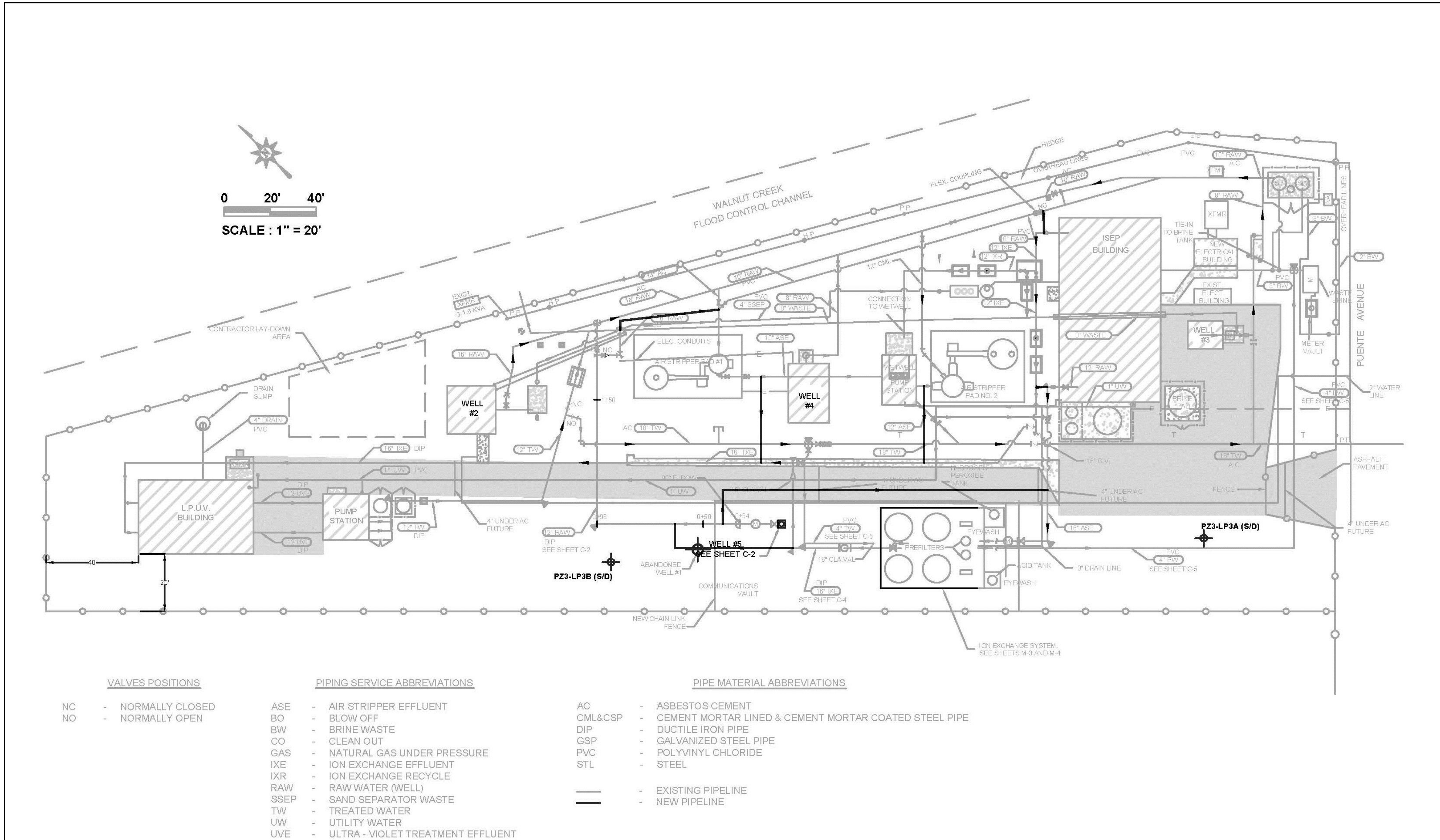
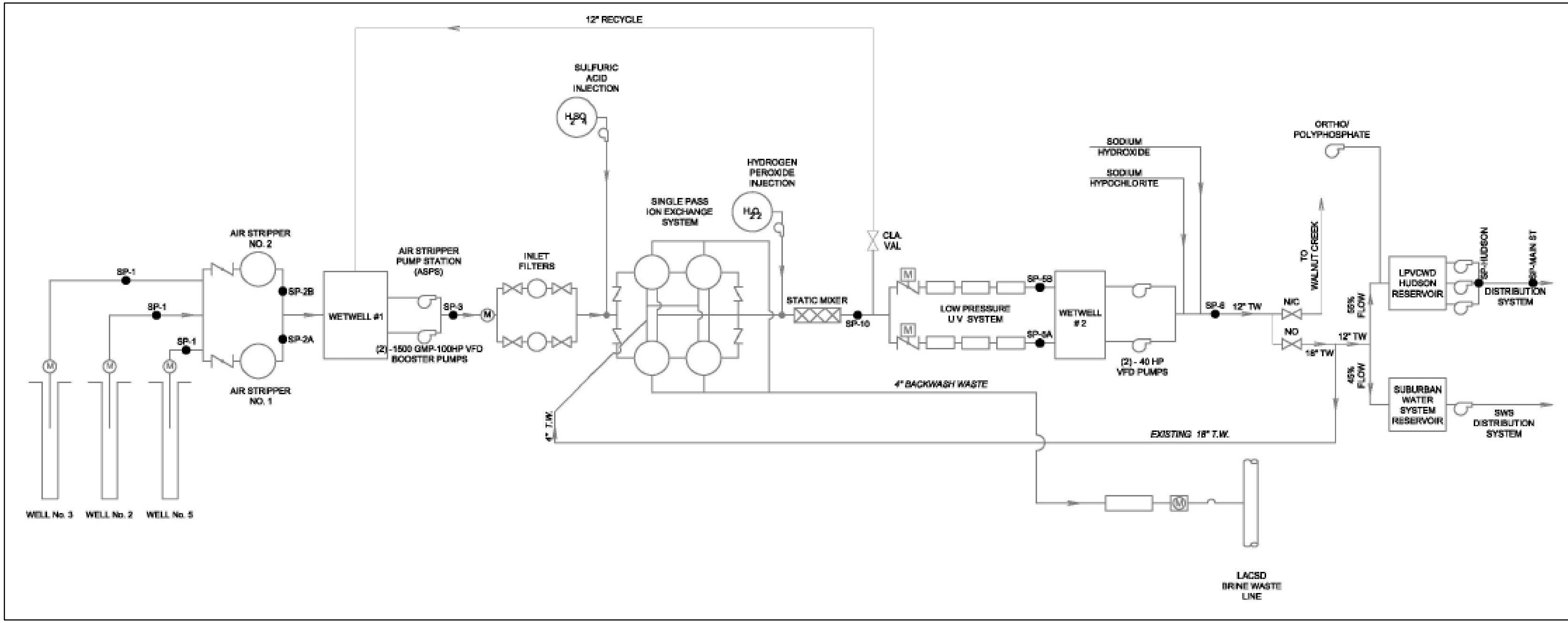


Figure 4-2 – Flow Diagram of LPVCWD Water Treatment Facility



CHAPTER FIVE - EXISTING WATER SYSTEM

5.1 General Description

LPVCWD was founded in 1924. LPVCWD's primary source of water supply comes from the Main San Gabriel Groundwater Basin. Once extracted, water is treated through LPVCWD's Treatment Plant and then conveyed to the Hudson Reservoir in Zone 1 of LPVCWD distribution system. In total, LPVCWD operates five interconnected pressure zones were 96% of customers are located in Zones 1 and 2. Booster Stations are located within the system to lift water to Zones 2, 3, 4, and the Industry Hills Reservoirs. Zone 5 and Zone 3 are both serviced by the Industry Hills Reservoirs, which also provide emergency supply for Zone 2.

LPVCWD's system includes approximately 2,500 service connections, 34.2 miles of distribution and transmission mains, 3 active Wells, 6 booster pump stations, and 3 reservoirs. Most of LPVCWD's infrastructure was constructed in the 1950's and 60's.

5.2 Supply System Facilities

The supply system for LPVCWD consists of groundwater Wells and emergency intertie connections. Under normal operating conditions, all supply is provided by groundwater.

5.2.1 Groundwater Wells

LPVCWD owns three active Wells (2, 3 & 5), one abandoned/destroyed Well (1) and two inactive Wells (4 and Orange). Wells 2, 3 and 5 are located at LPVCWD's Well field at 1695 Puente Avenue in Baldwin Park. Currently, only Wells 2, 3 and 5 are operational. The area of the groundwater basin in which Wells draw their water from is contaminated. A treatment plant was installed to treat contaminated groundwater to potable water standards as required by the DDW. Details of the active LPVCWD Wells are shown in **Table 5-1**. Under normal operation, Well No. 5 supplies all the source water to the treatment facility.

Table 5-1 – LPVCWD Active Wells

Well Designation	Year Installed	SCE Eff. Test	Capacity (gpm)	Total Head (ft)	Depth (ft)	Casing Dia (in)	Energy Source	Status
No. 2	1976[1]	Yes	1,606	215	947	16	Electric	Active
No. 3	1989[2]	Yes	1,101	203	800	16	Electric	Active
No. 5	2008	Yes	2,286	247	785	20	Electric	Active

In addition, details on two inactive Wells and one abandoned Well are shown in **Table 5-2**.

[1] Well No. 2 was originally drilled in 1926 and re-drilled in 1976

[2] Well No. 3 was originally drilled in 1962 and re-drilled in 1989

Table 5-2 – LPVCWD Inactive Wells

Well Designation	Year Installed	Capacity (gpm)	Depth (ft)	Casing Dia (in)	Energy Source	Status
No. 1	1925	NA	200	NA	NA	Abandoned
No. 4	1973	1,000	743	16	Natural Gas	Inactive
Orange			232			Inactive

5.2.2 Emergency Interconnections

LPVCWD has nine (9) emergency interconnections with its neighboring agencies. **Table 5-3** below shows the summary of these connections.

Table 5-3 – Emergency Interconnection Summary

Connection	Source	Zone Served	Size (in)	Capacity (gpm)
Suburban Water Systems Azusa Way & Hurley St.	SWS	LP Zone 2	6	500
Suburban Water Systems N. Hacienda Blvd. & Loukelton St.	SWS	LP Zone 1	6	700
City of Industry Waterworks System* San Jose Ave. & Holguin Place	CIWS	LP Zone 2	12	1,600
City of Industry Waterworks System* San Jose Ave. & Holguin Place	CIWS	LP Zone 5	4	500
City of Industry Waterworks System* Industry Hills-Pump Stat. 1 (Hill St.)	CIWS	LP Zone 1	12	1,600
City of Industry Waterworks System* Ind. Hills-Pump Stat. 3 (Industry Hills Pkwy.)	CIWS	LP Zone 2	10	1,600
City of Industry Waterworks System* Valley Blvd. & Proctor Ave.	CIWS	LP Zone 1	14	1,600
Rowland Water District Azusa Way & Hurley St.	RWD	LP Zone 2	8	700
San Gabriel Valley Water Co. Don Julian Rd. & Turnbull Canyon Rd.	SGVWC	LP Zone 1	8	1,200
San Gabriel Valley Water Co. Proctor Ave. & El Encanto	SGVWC	LP Zone 1	8	800

*Denotes Emergency Interconnection

5.3 Booster Stations

The LPVCWD has six (6) booster pumping stations within its District. Each one has between two (2) or three (3) booster pumps with varying horse-powers, design flows, and design heads.

Table 5-4 contains the summary of each booster pump in accordance to its booster pump station. If the pump had a recent SCE efficiency test, those results are shown below.

Table 5-4 – Booster Station Pump Data

Booster Station	Booster Pump Designation	Suction Zone	Discharge Zone	Horse Power	SCE Eff. Test/ Year	Capacity (gpm)	Total Head (ft)	Design Flow (gpm)	Design Head (ft)
Hudson Booster Station	Booster 1	Hudson Tank	PZ 1	75	Yes/ 2014	1,170	164.4	1,700	142
	Booster 2	Hudson Tank	PZ 1	75	Yes/ 2014	980	160	1,700	142
	Booster 3	Hudson Tank	PZ 1	75	N/A	---	---	1,700	142
Pressure Zone 2 (PZ 2)	Booster 1*	PZ 1	PZ 2	50	Yes/ 2013	725	154	700	231
	Booster 2	PZ 1	PZ 2	150	No/ 2013	1,290 (Z4) 1,620 (Z2)	305.4 (Z4) 240.7 (Z2)	1,556	277
	Booster 3*	PZ 1	PZ 2	60	Yes/ 2013	850	186.7	890	208
Pressure Zone 3 (PZ 3)	Booster 1	PZ 2	Industry Hills Tanks	10	Yes/ 2013	200	127	270	127
	Booster 2	PZ 2	Industry Hills Tanks	40	Yes/ 2013	620	131	680	133
Sub-Pressure Zone 3 (Sub PZ 3)	Booster 1*	PZ 3	Sub PZ 3	1.5	N/A	---	---	90	360
	Booster 2*	PZ 3	Sub PZ 3	1.5	N/A	---	---	90	360
Pressure Zone 4 (PZ 4)	Booster 1*	PZ 1	PZ 4	15	N/A	---	---	111	273
	Booster 2*	PZ 1	PZ 4	15	N/A	---	---	111	273
La Puente Treatment Plant	Booster 1*	LPUV Wetwell	Hudson Tank	40	Yes/ 2014	650	62	1,500	70
	Booster 2*	LPUV Wetwell	Hudson Tank	40	Yes/ 2014	735	60	1,500	70

* under the Booster Pump Designation column on **Table 5-4 indicates** VFD (variable frequency drive) controlled. VFD controlled pumps minimize pressure fluctuation and match the supply to demand. The other booster pumps are fixed speed pumps.

5.4 Control Valves

Within the LPVCWD system, there are seven (7) control valves – three pressure relief valves and four pressure reducing valves: one (1) LP Pressure Zone 4 pressure relief valve, one (1) LP Pressure Zone 2 pressure relief valve, one (1) pressure zone 3 relief valve, one (1) LP Pressure Zone 5 pressure reducing valve, one (1) LP Zone 1 pressure reducing valve, and two (2) LP Pressure Zone 2 pressure reducing valve.

The LP Zone 4 pressure relief valve maintains discharge pressure from LP's Pressure Zone 4 by relieving excess flow back to La Puente's Pressure Zone 1. This control valve is programmed to be normally closed unless the upstream pressure reaches above 125 psi.

The LP Zone 2 pressure relief valve maintains discharge pressure from LP's Pressure Zone 2 by relieving excess flow back to La Puente's Pressure Zone 1. This control valve is programmed to be normally closed unless the upstream pressure reaches above 95 psi.

The LP Pressure Zone 3 pressure relief valve maintains a consistent pressure in Zone 3 when the Zone 3 pump station is operated and feed from the Industry Hills Reservoirs is interrupted.

The LP Pressure Zone 5 pressure reducing valve help maintain a minimum pressure in LP Zone 5 by allowing water from the Industry Hills tank to flow into Zone 5. This control valve is programmed to be active with the set point of 66 psi.

The LP Zone 1 pressure reducing valve maintains a minimum pressure in LP Zone 1 by allowing water from the industry public utilities to flow into Zone 1.

The LP Pressure Zone 2 pressure reducing valves help maintain a minimum pressure in LP Zone 2 by allowing water from the Industry Hills tank to flow into Zone 2. This control valve is programmed to be normally closed unless the downstream pressure reaches below 44 psi.

5.5 Reservoirs

Zone 2 and 4 of the distribution system are supplied by the 3 million gallon and 1.8 million gallon reservoirs located on Main Street. The 3-million-gallon steel tank was relined and repainted in 2009. The 1.8-million-gallon steel tank was constructed in 2005. The 100,000-gallon concrete Hudson Reservoir is a transfer station from the treatment facility to Zone 1, which was reconstructed in 2000. With the completion of the relining and repainting of the 3-million-gallon tank, LPVCWD's water storage facilities are all currently in good condition.

Table 5-5 below shows the summary of the reservoirs within LPVCWD.

Table 5-5 – Reservoir Summary

Reservoirs	Base Elevation (ft)	Overflow Elevation (ft)	Depth (ft)	Geometry	Capacity (MG)
Hudson	321	335	16	Rectangle	0.1
Main Street No.1	450	488	40	Circular	3.0
Main Street No.2	450	488	40	Circular	1.8

5.6 Distribution System

The Distribution system for LPVCWD consists of transmission pipelines and distribution pipelines. Transmission pipelines are intended to efficiently carry large volumes of water between facilities while distribution pipelines carry water to LPVCWD's users and fire hydrants within each pressure zone accordingly.

5.6.1 Pipelines

LPVCWD's water system has approximately 34.2 miles of water pipeline, ranging in size from 2 inch to 18 inch. According to the Water Model database, there is about 180,619 feet (34.2 miles) within LPVCWD system and about 70,488 feet (13.4 miles) of pipelines are between 10 inches and 18 inches. Asbestos cement is the most common pipeline material within the system. LPVCWD's system also has pipelines of cement mortar lined and coated steel, polyvinyl chloride (PVC), and ductile iron. Asbestos cement pipe is no longer readily available due to environmental hazards associated with manufacturing and installation. When pipeline replacement within the system is needed, the asbestos cement pipe is replaced with PVC or ductile iron pipe

Table 5-6 shows the breakdown of existing pipelines by diameter and material of pipelines.

Table 5-6 – Pipeline Summary

Size (in)	ACP	CIP	DIP	PVC	STL	STEEL CML&C	Totals
2	44	742	-	90	514	-	1,390
4	14,339	-	37	729	1,352	-	16,457
6	46,998	-	815	3,390	184	32	51,419
8	38,376	-	740	914	731	85	40,846
10	3,968	-	2,203	231	-	37	6,439
12	19,323	1,020	1,824	-	43	2,149	24,359
14	9,562	93	-	-	-	-	9,655
16	20,070	-	-	-	364	-	20,434
18	1,835	-	7,416	-	350	-	9,601
	154,515	1,855	13,035	5,354	3,538	2,303	180,600

5.6.2 Pressure Zones

Currently, there are five pressure zones in the District's distribution system.

- Pressure Zone 1 is served by the Hudson Booster Station and the Main Street Reservoir.
- Pressure Zone 2 is served by the Pressure Zone 2 Booster Station located at the Main Street Reservoir site and active interconnections with Industry Public Utilities.
- Pressure Zone 3 receives water from Zone 2 and Industry Hills Reservoirs. Pressure for Zone 3 is provided by a metered interconnection with the Industry Hills Reservoir. The Banbridge booster pump station supplies water directly to the Industry Hills Reservoir during off peak hours to replenish water used on a routine basis.
- Pressure Sub – Zone 3 is served the Sub-Zone 3 booster pump station which receives water from the Industry Hills Reservoir.
- Pressure Zone 4 is served by the Pressure Zone 4 Booster Station located at the Main Street Reservoir site to the west of Pressure Zone 2 Booster Station. The Pressure Zone 4 Booster Station lifts water from Pressure Zone 1 to Pressure Zone 4. Pump 2 of the Zone 2 Booster Station also provides through automatic control flow to fire requirements in Zone 4
- Pressure Zone 5 (Holguin Place) is served through a 4-inch connection from the CIWS. The ten customers on Holguin Place receive water from the Industry Hills Reservoirs through a 4-inch metered pressure reducing valve which is set to maintain 65 psi. Zone 5 can also be served from the District's Zone 2.

Figure 5-1 contains a map of the District's system showing each Pressure Zone accordingly.

Figure 5-1 – Pressure Zone Map

5.7 Treatment Facilities

The Treatment Facility at LPVCWD is part of a cooperative effort to remove the groundwater contaminants from the Baldwin Park Operable Unit (BPOU), a subunit of the San Gabriel Valley Superfund site. The Watermaster, the San Gabriel Basin Water Quality Authority (WQA), and the Upper District are working with the LPVCWD to restore production at the LPVCWD Well field, which is located near the southern edge of the BPOU. This project is consistent with the requirements of the United States Environmental Protection Agency (USEPA) contained in the Record of Decision (ROD) for the BPOU.

The current flow capacity of the Treatment Facility is 2,500 gallons per minute. The Treatment Facility was designed so either Well No. 2 or Well No. 3 could provide raw water for treatment. Well No. 5 was completed and equipped in 2008. Well No. 5 is now the primary source of water to the treatment facility with Wells 2 and 3 used as backup sources.

The Treatment Facility is designed to treat VOCs, perchlorate, NDMA and 1,4-dioxane. Although the Treatment Facility was designed to treat water pumped from LPVCWD's Well No. 2 and No. 3, Well No. 5 has similar perforations and water quality compared to those of Well No. 2 and No. 3. Under normal operation, LPVCWD's Well No. 5 supplies all the source water to the Treatment Facility. In the event Well No. 5 is out of service for any reason, the Treatment Facility can treat water pumped from Wells No. 2 and No. 3. All operation and maintenance and monitoring described for Well No. 5 herein shall also apply to Wells No. 2 and No. 3 when in operation.

The general process of the Treatment Facility is as follows: Groundwater pumped by Well No. 5 (Well No. 2 and/or No. 3 if used) is conveyed to the air strippers. The air strippers remove volatile organic compounds (VOCs) in excess of the Maximum Contaminant Levels (MCLs). LPVCWD constructed a 1,000 gpm air stripper to remove VOCs, including but not limited to trichloroethylene (TCE), perchloroethylene (PCE), carbon tetrachloride (CTC), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethylene (1,1-DCE), and cis-1,2-dichloroethylene, which began operating in September 1992. Due to a continuing rise in VOC concentrations, another 1,500 gpm air stripper was constructed and began operating in September 1995. Air strippers operate at atmospheric pressure, so water must be re-pressurized to pass through additional treatment.

Each air stripping tower has an off-gas control unit containing vapor-phase activated carbon which is operated under the oversight of the USEPA. Air Strippers No. 1 and No. 2 were designed to treat 1,000 gpm and 1,500 gpm of flow, respectively. As the groundwater flows over the packing in the towers, the VOCs are transferred from the water to air flowing in a countercurrent direction. The VOCs in the air are removed by the activated carbon, and the clean air is released to the atmosphere.

From the air strippers, the water flows by gravity to a Wet Well where it is pumped by two 100 hp VFD booster pumps. The water is pumped from the Wet Well into the filtration system prior to the Single Pass Ion Exchange (SPIX) treatment system.

A pre-filtration system provides filtration to the inflow water of the SPIX treatment system. The filtration system consists of two filters, with one filter operating and the other filter on standby.

Each filter unit is rated for at least 3,500 gpm of flow. A bag filter is used with a filtering size of 10 microns.

After passing through the pre-filtration system, the water is injected with sulfuric acid prior to entry into the SPIX treatment system. A pH probe located downstream of the sulfuric acid injection point sends an electronic signal to the acid pump to inject the correct amount of sulfuric acid to maintain the pH between 7.25 and 7.5.

After sulfuric acid injection, water flows through the SPIX system. The SPIX treatment system consists of two pairs of ion exchange vessels arranged in parallel. Each pair of ion exchange vessels is comprised of two vessels operating in series to form a lead-lag configuration, for a total of four vessels. The fixed bed SPIX treatment system is designed to reduce the concentration of perchlorate in the water to at least below the current DDW detection limit for purposes of reporting (DLR) of 4 µg/l.

Downstream of the SPIX system, hydrogen peroxide is injected into the flow stream. Hydrogen peroxide enhances NDMA destruction with UV radiation and is necessary for the destruction of 1,4 Dioxane in the UV reactors. The UV system also operates under atmospheric conditions. The treated water from the UV system flows to a Wet Well. Two 40 hp VFD booster pumps pump the flow from the Wet Well to the District's distribution system via the Hudson Reservoir. Just downstream of the UV Wet Well pumps, the treated water is disinfected with sodium hypochlorite and the pH is adjusted with the addition of sodium hydroxide. After disinfection, the treated water flows via a 16-inch pipeline to the Hudson Reservoir.

CHAPTER SIX– COMPUTER MODEL

6.1 General Description

The computer modeling program used to model LPVCWD's water system is the InfoWater software by Innovyze. InfoWater is a sophisticated and powerful software package that uses GIS as a visual interface. It operates under a Windows environment to perform steady state analyses of water distribution systems including pipes, pumps, reservoirs, tanks, and control valves.

6.2 Water Model Development Methodology

The water system was created by using elements and nodes to generate LPVCWD's water system. An element represents a pipe within the water system and performs as a fluid conductor. Each element is connected to two nodes to represent the beginning and end of a pipe. There are five type of nodes utilized in the program:

- Reservoir – A reservoir represents a fixed head source with an infinite volume such as an aquifer or imported water connection.
- Tank – A tank represents a variable head source with a finite volume that may fill or empty.
- Pump – A pump adds head to the system in a predetermined direction according to a performance curve of head vs. flow.
- Valve – A valve subtracts head from the system in a predetermined direction. There are multiple types of valves including pressure reducing, pressure sustaining and flow control.
- Demand Node – System demands are estimated for an area and allocated to the nearest demand node as a fixed flow.

InfoWater generates and maintains an interactive database containing static and variable data. The static data represent physical elements of the water system that remain constant over time, such as pipes, reservoirs, pumps, valves, hydrants, and other appurtenances. The variable data represent the dynamic aspects of the water system that tend to change over time, such as demand, reservoir levels, pump, and valve operations. A scenario is a predetermined combination of static and variable elements that represents a set of boundary conditions of interest to the engineer. Through an iterative process, InfoWater applies a hydraulic gradient algorithm to the boundary conditions provided in the scenario to predict the hydraulic performance of the system.

InfoWater has the option of using one of three equations for head loss: Hazen-Williams Equation, Manning's Equation and Darcy-Weisbach Equation. The Hazen-Williams equation, which is an empirical formula applicable to turbulent flow, is the most frequently used and therefore, was used in the Water Model.

6.2.1 Data Sources

LPVCWD provided the necessary information that was required for the development of the hydraulic water system model for their 2017 master plan. The following information was used:

- LPVCWD's 2009 Master Plan
- LPVCWD Water Atlas maps
- GIS Files
- Digital Elevation Model (DEM) provided within InfoWater
- Historical water production data records
- Facility Drawings provided by LPVCWD of booster stations
- So Cal Edison (SCE) pump efficiency test results
- Facility Controls provided by LPVCWD, such as:
    - Tank water levels
    - Pump controls and settings of pressure regulating valves
    - Well and booster operational controls
- Fire Hydrant flow field testing results

Other additional data was obtained over the course of creating the master plan with the assistance of LPVCWD's General Manager, Water Production Supervisor and staff by numerous meetings and coordination.

6.3 Water Model Construction

Model Construction consisted of database programming of all fixed data and variable data required to perform hydraulic calculations in the LPVCWD system.

6.3.1 Input Data and Simulation Conditions

Input data (aka boundary conditions) are broken down into fixed data and variable data.

Fixed Data

The bulk of Water Model construction revolves around programming fixed data into the databases. These fixed data were drawn largely from the GIS files and Water Atlas maps provided by LPVCWD as well as other publicly available documents and files.

Fixed data does not change with time, and are generally described as infrastructure (i.e. the location, alignment, geometry and connectivity of pipes, pumps, valves, tanks, and aquifers). The Water Model stores fixed data as Element Databases, and the user selects precisely which elements to include in a simulation by defining a Facility Set (i.e. a collection of Element Databases).

When constructing the Water Model, the LPVCWD GIS files and Water Atlas maps contained information on:

- District boundaries
- Pipes – alignments, materials, diameters, years of installation, and connectivity
- Plants – layouts, components (tanks, Wells, pumps, valves)
- Fire Hydrant locations
- PRVs – locations

Supplemental vertical control data for Water Model construction were acquired from a digital elevation model (DEM) complementary of InfoWater. InfoWater uses its "elevation extractor" tool to extract invert elevations of junctions from the DEM file to create the elevation data. The coordinate system used for the Water Model is *NAD 1983 State Plane California V FIPS 0405 (US FEET).*

Variable Data

Variable data are subject to change with time, including pump or valves settings and controls, demands, etc. The Water Model stores variable data as Data Subsets, and the user selects precisely which variable data to include in a simulation by defining a Data Set (i.e. a collection of Data Subsets). Some of these data are within LPVCWD's power to control, such as pump activity and valve settings.

Use of Pump Efficiency Test Data

To assure the Water Model corresponds as closely as possible to field conditions and operational preferences, all pumps were programmed per data provided by LPVCWD including the most recent SCE pump efficiency tests for all Wells and booster pumps, and operational settings for pumping facilities and control valves.

The Water Model requires each pump to be programmed to respond to variation in intake and discharge pressure according to a performance curve. A performance curve describes the relationship between flow (Q) and total hydraulic head[1] (H) inherent in the physical properties of the pump mechanism.

[1] Head refers to the energy transferred from the pump to the water. It is typically given in units of feet, which may be thought of as the energy required to raise the water a certain number of feet above its current level.

The performance curves used in this update are called design point curves. A design point curve uses a single point (i.e. head and flow) to generate a generic curve approximating the pump's actual performance. These points were taken directly from the most recent pump efficiency tests. The Water Model calculates a parabola that passes through the following set of points to approximate the curve:

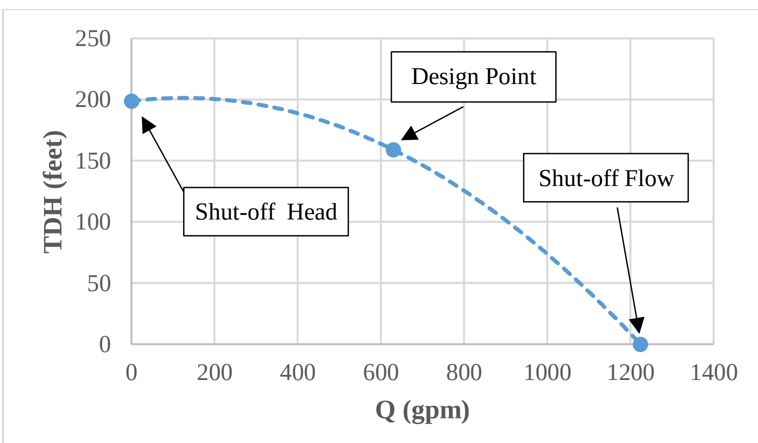
- design point (H, Q)
- shut-off head (1.3H, 0)
- shut-off flow (0, 2Q)

For example, the Main Street Booster Pump No. 1 was rated by SCE to have a flow of 630 gpm at a total dynamic head of 158.9 feet. The Water Model computed the second-degree polynomial curve for the Main Street Booster Pump No. 1 based on that design point as shown in **Table 6-1** and **Figure 6-1**.

Table 6-1 – Input Data for Main Street Booster Pump No. 1

Point	H (feet)	Q (gpm)
Shut-off Head	206.6	0
Design Point	158.9	630
Shut-off Flow	0	1,260

Figure 6-1 – Design Point Curve for Main Street Booster Pump No. 1



Similar curves were calculated for all other booster and Well pumps in the distribution system. The Water Model uses these curves in its iterative steady state solution to determine the energy imparted to the water by the pump when the pump is active.

Simulation Conditions

Once all the input data is programmed, simulations can be programmed. Prior to initiating the simulation, the user defines the conditions of the simulation (i.e. the calculation to be performed). Conditions used in the preparation of this report include:

- Steady State Simulation (a single solution at a moment in time)
- Fire Flow Simulation (a series of steady state solutions assuming a fire flow demand is applied to designated hydrant locations in turn)
- Multi-Fire Flow Simulation (a steady solution describing the performance of multiple hydrants flowing simultaneously)

The power of the Water Model is to save and recall any combination of fixed data, variable data and simulation conditions. These are referred to as Scenarios in the Water Model.

6.3.2 Demand Allocation

Water demand was allocated to the Water Model on a pressure zone by pressure zone basis. With the help of previous master plans and guidance of LPVCWD's staff, the demand was distributed by pressure zone for each scenario with the help of the peaking factor calculated.

The existing water demands in the Water Model are allocated using actual water produced obtained from LPVCWD's production data for the study period of 6 years from 2010 through 2016. The future water demands are allocated using the year 2020 demand projections, determined based on land use and population growth as discussed in Chapter 2. The process of how the allocation of both existing and future water demands to model nodes is described below.

Existing Demands

The water demands for existing conditions are based on actual production data obtained from the Wells provided by LPVCWD. The production data covers the water produced per day for each study period calendar years between 2010 and 2016.

After reviewing and analyzing data, a summary was created for each pressure zone within the LPVCWD's water system. Once the summary was completed, the demand for each pressure zone was distributed approximately per each node. These nodes represent meters to home, intersection of pipeline mains and cul-de-sac ends. **Table 6-2** below shows each pressure zone within LPVCWD's water system and their corresponding demand per each scenario.

Table 6-2 – Existing Demands within Water System

Pressure Zone	Nodes Programmed	ADD (gpm)	MDD (gpm)	PHD (gpm)
PZ 1	344	719	1,588	2,380
PZ 2	116	309	682	1,023
PZ 3	7	18	38	59
PZ 4	21	25	56	83
PZ 5	6	4	9	13
Total Demand (gpm) per Scenario	**494**	**1,075**	**2,373**	**3,558**

Future Demands

For the allocation of future demands, the projected water demand as described in Chapter 2 was programmed to reflect the projected average demand for the calendar year of 2020. The number of service connections increase at an average rate of approximately 1% per year. With this growth rate for LPVCWD, along with the existing average demands, the future demands were calculated and summarized.

Table 6-3 shows each pressure zone within LPVCWD's water system and their corresponding demand per each scenario.

Table 6-3 – Future (YR 2020) Demands within Water System

Pressure Zone	Nodes Programmed	ADD (gpm)	MDD (gpm)	PHD (gpm)
PZ 1	353	755	1,666	2,499
PZ 2	119	329	726	1,088
PZ 3	8	19	41	62
PZ 4	22	26	59	88
PZ 5	10	4	9	13
Total Demand (gpm) per Scenario	**512**	**1,133**	**2,501**	**3,750**

Development of Modeling Scenarios

Modeling scenarios are used in the water model to provide means to store different facility sets, operation conditions and data sets. For the LPVCWD model, three different steady state scenarios were created for simulation. These scenarios were (1) Average Day Demand (ADD), (2) Maximum Day Demand (MDD) and (3) Peak Hour Demand (PHD).

The ADD Scenario would serve as a benchmark and as a planning tool for long-term issues at the system level, such as supply acquisition and integrated resources management.

The MDD Scenario would serve as a planning tool at the pressure zone level. MDD is the peak loading for typical booster-reservoir pressure zones for analysis of supply requirements. MDD is intended to determine the system's capacity to meet fire flow requirements under a worst-case scenario while maintaining a minimum residual pressure of 20 psi throughout the system.

The PHD Scenario would serve as a planning tool at the pipe level. Pipes must function adequately under this loading. PHD is intended to examine the impact of the worst case normal operating scenario on both transmission and distribution pipe velocity and system pressures.

Output Data

Following a successful simulation, Water Model output data include (1) pressure at every point, (2) flow and energy losses through every pipe and (3) performance of every valve, pump and tank. Data output format may be tabular, graphic or both depending on the nature of the Scenario.

6.4 Model Calibration

Calibration was achieved by making incremental adjustments to elements in the Water Model associated with energy loss until modeled results and field data were comparable. Energy losses occur due to friction between flowing water and pipe walls, and due to changes in the momentum of flowing water. In general, friction losses are the primary sources of energy losses in any distribution system which is essentially comprised of relatively long and straight small diameter pipelines that carry water at low velocities.

Production, treatment and booster facilities also experience energy losses caused by changes in momentum due to plant components that influence the flow stream such as control valves, tank inlets and outlets, bends, meters, manifolds, and treatment vessels.

6.4.1 Steady State Calibration

Steady state calibration focuses on verification of vertical control and energy losses due to friction in the system.

Vertical control was established by two means: verification of elevations from historical maps and comparison of historical fire flow records to model results.

The basemap includes elevation data at key intersections throughout the system. Water Model elements adjacent to these intersections were assigned the basemap elevation and elements between these intersections were assigned an interpolated value.

Each fire flow record contains a static pressure measurement at a specific point and time. A comparison was made between the historical records and model output, and adjustments were made to the Water Model elevations to bring model output into agreement with these field data.

Energy losses in the system are the result of friction between flowing water and the interior of the pipe walls. For purposes of the Water Model, the pipe roughness is described by a coefficient known as the Hazen-Williams roughness coefficient (aka C-factor). Flow tests were conducted to measure energy losses in a number of pipes in the LPVCWD system.

CHAPTER SEVEN – WATER CONSERVATION PROGRAMS

7.1 General Description

Chapter 7 provides guidance for the implementation of a water conservation program in line with LPVCWD's goals.

By convention, a water conservation project is the implementation of a unique methodology for achieving water use reduction, and a water conservation program is a set of projects implemented collectively to achieve a water conservation goal.

7.2 Existing Water Conservation Projects

The LPVCWD's water conservation program is largely a coordinated effort involving the Upper District. The following activities provide water conservation:

1. Ultra-High Efficiency Toilet [administered by LPVCWD]
2. Large landscape audits of LPVCWD customers [administered by Upper District]
3. Toilet giveaway [administered by Upper District]

7.3 Approach to Water Conservation

The general water conservation approach is to define a goal, then implement a cost-effective program to meet that goal. Since water conservation goals are typically long-term, it is important to monitor progress toward the goal and make adjustments as needed to remain on the path towards achievement.

LPVCWD has no clear defined mandate or internal goal for water use reduction, and has requested an incremental approach that relates investment to water use reduction for further consideration. With this in mind, the following approach is recommended:

1. Create a list of candidate water use reduction projects.
2. For each project, develop an economic model that relates investment to volume of water saved.
3. Determine the combination and intensity of projects that correlate investment to volume of water saved.
4. Implement the program and monitor water use reduction.
5. Make period adjustment as needed based on program performance.

7.4 Cost and Accounting Conventions

Volumetric commodity rates will be converted to thousands of dollars per million gallons ($K/MG).

Water conservation project performance is a combination of project implementation costs and the associated impact to revenue.

Recommendations for project implementation can be given as a target range with limits corresponding to a percentage of the maximum water use reduction assigned to the project. This is equivalent to a range of costs. Included in the range of costs will be the level of intensity associated with the optimal cost solution.

The target cost ranges and optimal costs may be given for the 5-year period ending in 2020. This will provide a starting point for project funding and implementation. When documentation of water conservation projects is recorded, the data may be analyzed to determine the most optimal water conservation solution considering economics and water savings.

7.5 Water Conservation Program Scope and Goals

The scope of the water conservation is a planning horizon and a level of water use reduction. The planning horizon may be set at five years (i.e. 2020), which coincides with the guidance of the UWMP Act. However, LPVCWD is not obligated to comply with the provision of the UWMP Act as its number of service connections and retail water sold falls under the threshold for such requirement. The level of water use reduction can be presented as a curve relating investment to volume saved with proper data. This curve is intended to serve as guidance to LPVCWD in choosing a preferable level of water use reduction and programs that are most beneficial for implementation.

7.6 Candidate Water Conservation Programs

Ten potential water use reduction projects can be considered for future projects and accounting as follows:

- Recycled Water
- Audit, Leak Detection and Repair
- Smart Meters
- Turf Removal
- Residential ULF Toilets
- Residential Survey
- Irrigation Controllers
- Plumbing Retrofit
- HE Washing Machine

The subsections that follow provide descriptions of each project which may be utilized in future efforts in the development of economic models.

7.6.1 Recycled Water

Recycled water is a low-quality alternative to potable water and is suitable for irrigation and certain industrial uses. To meet health regulations, recycled water must be distributed via a dedicated system separate from the potable water system. LPVCWD has performed a recycled water study demonstrating the potential demand for recycled water and the level of dedicated infrastructure needed to implement a recycled water distribution system.

7.6.2 Audit, Leak Detection and Repair

Per CUWCC (2005), this activity consists of three components:

- System audits
- Leak detection
- Leak repair

Per AWWA (1999), system audits include quantifying all produced and sold water, and includes testing meters, verifying records and maps, and field checking distribution controls and operating procedures. The objective is to determine the amount of water that is lost and unaccounted for in the system. System audits may identify losses from:

- Accounting procedure errors
- Illegal connections and theft
- Malfunction distribution-system controls
- Reservoir seepage, leakage, and overflow
- Evaporation
- Detected and undetected leaks

Leak detection is the process of searching for and finding leaks in the system with sonic, visual, or other indicators. It should be noted that sonic and acoustic leak detection equipment have been found to be more accurate for smaller systems than for larger systems. Audits and detection programs incur costs whether or not repairs are made; thus, audits and detection alone do not save water. Conversely, leaks are sometimes discovered without organized audit and detection programs.

7.6.3 Smart Meters

Smart Meters work in tandem with leak detection and repair to reduce water loss (more specifically non-revenue water) by identifying defective meters for replacement and inaccurate meters for recalibration. The Smart Meters project would complement a meter replacement program by getting the most out of new assets through efficient application.

A Smart Meter is an electronic transmitter that collects real-time consumption data and sends it to a central processing unit for analysis. Needed infrastructure includes transmission towers for collection of radio transmissions, and a computer system for data processing. The computer system detects anomalies in meter data that may be due to meter inaccuracy or to leaks on the customer side of the meter.

7.6.4 Turf Removal

Turf removal means replacement of high water demand landscaping with more drought tolerant landscaping.

7.6.5 Residential ULF Toilets

This project seeks to replace standard residential toilets with ultra-low-flush toilets.

7.6.6 Residential Survey

Per CUWCC (2005), residential home surveys target both indoor and outdoor water use. In practice, home surveys usually include a site visit by trained staff that: (1) solicits information on current water use practices; and (2) makes recommendations for improvements in those practices. Sometimes, indoor plumbing retrofit devices are directly installed when appropriate. The outdoor portion of the survey can vary widely, ranging from an intensive outdoor water efficiency study (turf audit, catch can test, and written recommendations for irrigation scheduling or landscape changes) to simple provision of a brochure on outdoor watering practices.

7.6.7 Irrigation Controllers

Per CUWCC (2005), this project addresses technologies that automatically adjust irrigation controllers according to the needs of the landscaping. In particular, this project covers technologies that have been developed to adjust schedules according to real-time measures of evapotranspiration (ETo)—or water needs more generally—including temperature, rainfall, soil moisture, and/or sunlight. Historical weather data may also be used in the controller programs. Some of these systems transmit information to the irrigation controller by satellite pager and some include two-way communication via telephone lines.

7.6.8 Plumbing Retrofit

Per CUWCC (2005), residential plumbing retrofit involves modifying the following fixtures with low flow devices: showerheads, toilets and faucets.

Low flow (LF) showerheads are designed to provide water at lower rates of water flow. Flow is typically measured in gallons per minute and low flow showerheads are rated at 2.5 gallons per minute (gpm) or less (at pressure levels up to 80 psi). California state law currently requires that all showerheads sold in the state meet the 2.5 gpm standard.

Toilet displacement devices come in a variety of designs that displace some water volume in the toilet tank. Since less water is needed to refill the tank, less water is used per flush. Toilet leak detection is typically performed with dye tablets. Faucet aerators reduce flow from faucets.

7.6.9 High Efficiency Washing Machines

This project seeks to replace standard residential washing machines with those designed to save energy and water.

CHAPTER EIGHT – EVALUATION CRITERIA

8.1 General Description

Design and planning criteria are used (1) as a benchmark for evaluating the capacity of the existing water distribution system and (2) as a guide for recommending improvements to meet future conditions. As a convention, each criterion or set of criteria is indicated in italics followed by a detailed description of its purpose and the driving factors behind its inclusion.

8.2 Study Period

Water demands for existing conditions are based on the production data collected by LPVCWD. The production data covers the study period between January 2009 through December 2016.

8.3 Design Criteria

Design Criteria are used to evaluate the hydraulic capacity of the distribution system. Such an evaluation is a quantitative analysis comparing field measurements or engineering calculations with a series of benchmarks that reflect customer expectations, the regulatory environment, sustainable design, redundancy, reliability, functionality, emergency preparedness, efficiency, economics, and other issues of importance to LPVCWD.

8.3.1 System Pressure

Goal for normal system pressure range: 40psi to 125 psi.

The level of service that is provided for domestic use is based on the available water pressure. A minimum pressure of 40 psi is consistent with the Water Code[1].

Per the City and LPVCWD 2009 Master Plans, 120 psi was the highest observed service pressure. Note that 150 psi is the typical pressure rating for distribution system components and the Plumbing Code recommends individual pressure regulators for any service pressure over 80 psi[2].

It is recommended a goal for service pressure to range from 40 psi to 125 psi. This pressure range minimizes negative impacts to customers along with the water distribution system, and should be readily achievable based on historical system performance documentation.

Goal for minimum service pressure during fire: 20 psi.

Under fire flow conditions, residual pressures should not fall below 20 psi[3] when delivering the required fire flow rate. The minimum residual pressure requirement is established by the DDW.

[1] Title 22, Chapter 16, §64602

[2] Individual pressure regulators should be installed on any services that could have pressure greater than 80 psi at the meter as recommended in Section 1007 (b) of the California Plumbing Code. It is typically the customer's responsibility to install and maintain these pressure regulators at their own expense.

[3] Title 22, Chapter 16, §64602

This threshold provides a buffer against the possibility of negative pressure in the distribution system which could result in contamination ingress. Guidance on fire flow requirements for (1) subdivision of land, (2) construction of buildings, and (3) alteration/installation of a fire protection water system is provided by Los Angeles County Fire Department Regulation #8 (V7-C1-S8, Fire Flow and Hydrant Requirements, see **Appendix E**). An exception to the 20-psi minimum is allowed for fire hydrants that are located so close to reservoirs as to not be able to achieve the requirement for pressure residual. These hydrants shall be designated as “draft hydrants” and piping shall be sized from the reservoir to the hydrant to provide the fire flow requirement as close to the local static pressure as possible. Note that individual jurisdictions may have varying fire flow requirements. It is recommended to provide a level of fire protection consistent with Regulation #8, and to examine requirements for new construction on an individual basis in cooperation with the local planning jurisdiction and the local Fire Marshal at the developer’s expense. The residual pressure requirement is driven by the regulatory environment.

Goal for maximum pressure during minimum hour: 150 psi or pipeline pressure class, whichever is less.

Maximum pressures typically occur (1) at production and transmission facilities such as Wells, booster pumping stations and control valves or (2) at low elevations. Under no circumstances should the pressure in the system exceed the pressure class rating of the pipe. During minimum hour demands when booster and Well pumps are operating to refill reservoirs, pressures should not exceed 150 psi as an ultimate goal, or the pressure rating of the pipe, whichever is lower.

During the normal operation of facilities, a surge of energy may affect the system when a pump is turned on or off or when a control valve is opened or closed. This energy surge creates a pressure wave that could potentially damage sensitive machinery or vulnerable pipelines already under high pressure. Various devices and operational techniques should be installed or implemented to mitigate the negative impacts of surge and to assure that pressures do not exceed 150 psi or the pressure class of the pipe, whichever is greater.

The goal for maximum system pressure is driven by sustainable design.

8.3.2 Supply

Pressure Zones with Gravity Storage

In pressurized systems, the hydraulic gradient is established artificially and maintained by a pressure regulating device. The sources of supply to pressurized systems must be capable of delivering all normal and emergency flows.

Combined production capacity of maximum day demand with largest single source out of service.

For each pressure zone with gravity storage, the sum of the sources of supply (with the largest single source of supply off-line) must be able to provide dependent MDD[4]. The concept of supply

[4] Title 17, Chapter 16, §64554

includes all normal methods by which water enters a pressure zone such as Wells, booster pumping stations, pressure reducing stations, and interties. As such, the design engineer has a degree of flexibility in combining various sources to meet the supply requirement.

Note that dependent MDD takes into account the staging of produced water from pumping to higher pressure zones that are dependent on sources in lower pressure zones.

Combined production capacity sufficient to refill emergency and fire storage in two days (48 hours) under MDD conditions with all sources operating.

A depletion of emergency and fire storage creates a temporary vulnerability to immediate, ongoing or subsequent events that would otherwise be mitigated. This vulnerability can be minimized by rapid replenishment of storage. Therefore, normal supply capacity must be sufficient to refill emergency and fire storage in two days (48 hours) under MDD conditions with all sources operating.

Pressure Zones without Gravity Storage

If gravity storage is not available, supply capacity must satisfy two conditions with the largest single source out of service:

Combined production capacity of maximum day demand with fire flow at 20 psi.

PHD at a minimum system pressure of 40psi.

8.3.3 Storage Capacity

Sum of Operational, Fire and Emergency Storage in each pressure zone.

- Operational Storage: 30 percent of maximum day demand
- Fire Storage: per LA County Fire Dept. Regulation #8
- Emergency Storage: 24 hours at maximum day demand

The principal functions of storage are:

- To equalize fluctuations in hourly demand so that extreme and rapid variations in demand are not imposed on the source of supply
- To provide water for firefighting
- To meet demand during an emergency such as a disruption of the major source of supply, a power outage, a pipe break, or other unforeseen emergency or maintenance issue

Operational Storage: Operational storage describes the volume needed to equalize the difference between supply and demand over the course of a day. Maximum operational storage would typically occur under the maximum day demand conditions. The volume of operational storage, as an industry standard, averages between 20 to 30 percent of maximum day demand. As a result, the recommended operational storage should be equal to 30 percent of maximum day demand for all pressure zones with storage. The operational storage requirement is driven by system functionality.

Fire Storage: The water system should be capable of meeting maximum day demand and firefighting requirements simultaneously. Fire storage represents one maximum event in terms of fire flow and duration. The fire storage requirement is driven by emergency preparedness.

Emergency Storage: Emergency storage is required to meet demands during times of planned and unplanned equipment outages such as pump breakdown, power failure, pipeline rupture, etc. Emergency storage is estimated based on the water supply to a pressure zone being out of service for a period of 24 hours under maximum day demand conditions. The emergency storage requirement is driven by emergency preparedness.

8.3.4 Pressure Reducing Stations

Capacity equals MDD plus Fire Flow or PHD within the continuous rating of valves.

Maximum intermittent flow rating of valves for fire flows is acceptable at 20 psi and 40 psi respectively.

In general, pressure reducing stations should be provided when needed to supplement deliveries to lower pressure zones or pressure sub-zones. Pressure reducing stations should also be considered when distribution piping is operated at or above the maximum pressure rating of the pipe. Pressure reducing stations shall be sized to meet peak hour demand or maximum day demand plus fire flow, whichever is greater, within the continuous flow rating of the valves. It is recommended that three valves be installed within each pressure reducing station that is intended to feed a small closed pressure zone. Two smaller valves should be installed that combined, can provide MDD. One larger valve should be installed that can provide all flow required in the zone.

8.3.5 Pipeline Sizes

Standard pipe size

Use standard pipe sizes of 6, 8, 12, 16 and 24-inches for distribution. The diameter of a replacement pipeline should be a minimum of 8-inches, unless hydraulic analysis demonstrates that a 6-inch pipeline will suffice. Use of nominal pipe diameters is driven by economics and standardization.

8.3.6 Transmission Mains

Maximum pipe velocity under normal operating conditions: 5 feet per second.

Maximum energy loss under normal operating conditions: 10 feet of head loss per 1000 feet of pipe.

Booster station intake and discharge pipelines sized for maximum pipe velocity of 5 feet per second.

Booster station intake and discharge pipelines sized for maximum energy loss of 10 feet of head loss per 1000 feet of pipe.

Transmission mains are intended to efficiently carry water at a high flow rate between facilities (i.e. production, treatment, booster stations, and storage). Energy losses along transmission corridors can be managed/reduced by controlling pipe velocity. The primary methods for controlling pipe velocity are (1) increasing pipe diameter, (2) providing multiple flow pathways and (3) reducing flow rate. Regardless of the method used, efficiency drops rapidly when pipe velocity exceeds 5 feet per second. Note that velocity and energy loss (i.e. feet of head loss per 1000 feet of pipe) are indirectly related measurements of transmission efficiency and should both be examined independently.

Dramatically over-sizing the transmission mains to reduce velocity can inadvertently increase detention time leading to certain water quality issues. As time increases between the points of production and delivery, complications due to stagnation and decay of disinfectant residual outweigh improvements in energy efficiency. Therefore, a balanced system will simultaneously keep energy loss and water quality degradation in check.

Transmission main capacity criteria are driven by efficiency and water quality management.

Pipe velocity range for reservoir inlet-outlet is 6 feet per second.

A reservoir is a passive system that should simultaneously complement transmission and provide emergency flow. Pipe velocity from a tank increases in response to emergency conditions, but velocities in excess of 6 feet per section represents a bottleneck that may constrict emergency deliveries.

8.3.7 Distribution Mains

Sized to satisfy three conditions:

(1) Maximum day demand plus fire flow with residual pressure of 20 psi

(2) Peak hour demand with a minimum system pressure of 40 psi

(3) Maximum pipe velocity: 10 fps under Maximum day demand plus fire flow but 7 fps otherwise

Distribution mains carry water to service connections and fire hydrants. Fire flow is typically the governing factor in sizing distribution mains, although normal operations under peak demand conditions should also be examined for efficiency. Distribution main design is driven by efficiency and emergency preparedness.

8.3.8 Fire Flow and Fire Hydrant Spacing Requirement

Fire hydrant spacing and flow are specified per LA County Fire Department Regulation #8 or as determined by the Fire Marshall. Fire requirements are driven by the regulatory environment and emergency preparedness.

In general, Regulation #8 provides guidance for determining the fire flow requirements for new construction that consider the following conditions:

- Occupancy and use
- Building materials
- Proximity to adjacent structures
- Ground floor area
- Number of floors
- Access to hydrants
- Allowances for the installation of fire suppression systems

In addition, rules concerning meeting high fire flow requirements with multiple hydrants flowing simultaneously are made explicit.

For purposes of testing the adequacy of the existing system, the following fire flows[5] are applied based on Land Use:

- 1,250 gpm (in min. duration 2 hours)[6]: Single Family Residential
- 3,000 gpm (in min. duration 3 hours)[7]: Multi-Family Residential, Mobile Homes/Trailer Parks, Retail/Commercial Services, Agriculture
- 4,000 gpm (in min. duration 4 hours): Public Facilities, Educational Institutions, Light Industrial, Heavy Industrial, Transportation, Utility Facilities

It is assumed that all fire hydrants met the Fire Marshal's requirements at the time of installation and that those requirements have been "grandfathered" in. Existing residential fire hydrants should have a capacity of 1,250 gpm while new residential fire hydrant new fire flow requirements will be established following one of three actions: new construction, land subdivision or water system upgrade.

8.4 Planning Criteria

Planning Criteria deal with parameters related to cyclical infrastructure refurbishment or replacement due to age and condition. The primary concern of Planning Criteria is to establish the

[5] Fire Flows taken from 2013 California Fire Code, **Appendix E**

[6] Fire Flows may be reduced by up to 50 percent when the building is equipped with an approved automatic sprinkler system.

[7] Fire Flows may be reduced by up to 75 percent when the building is equipped with an approved automatic sprinkler system.

practical service life of each system component and a performance indicator to verify whether maintenance or replacement will result in an economic benefit. These performance indicators may include efficiency, reliability and maintenance history.

Planning criteria deal with cyclical infrastructure replacement due to age, condition and other non-hydraulic factors. It is possible for a pipeline or other of piece of equipment to meet the hydraulic requirements established by design criteria, while at the same time exhibiting costly repairs or downtime due to fatigue, corrosion, normal wear, poor workmanship, incompatibility, or other issues associated with deterioration. Planning criteria provide a secondary methodology for identifying and mitigating vulnerabilities in the system by a combination of qualitative and quantitative analysis.

Planning criteria are not meant to be a rigid set of rules that narrowly define service life; rather, they provide guidance for determining those portions of the distribution system that would benefit most from replacement in advance of higher and unsustainable costs associated with maintenance and inefficiency.

8.4.1 Preferred Replacement Schedule

Well designed and maintained water systems will provide many years of superior performance, but at some point, replacement of individual components is necessary for sustainability.

Table 8- 1 below provides general parameters for determining when a particular component should be considered for replacement. A combination of average service life and performance indication provides more solid justification for capital replacement.

Table 8- 1 - Infrastructure Replacement Criteria

Component	Interval (years)	Indication
Pipeline	AWWA[8]	Frequent repair history, excessive energy losses
Pump/Motor Overhaul	15	Drop in efficiency below 65%
Pump/Motor Replacement	30	Frequent repair history, drop in efficiency
Control Valve Overhaul	25	Leaks, poor response, frequent repairs
Tank Recoating	20	Evidence of corrosion
Tank Replacement	80	Frequency/extent of repair history
Well Refurbishment/Replacement	50	Decline in effective capacity
Production meter calibration	5	Drop in accuracy
Production meter replacement	20	Drop in accuracy and reliability

[8] AWWA outlines expected service life for pipes based on their materials. For systems in the west with fewer than 3,300 service connections, expected pipe service life ranges from 60 to 130 years, depending on materials.

CHAPTER NINE– ANALYSIS AND PROPOSED IMPROVEMENTS

9.1 General Description

The basis for system analysis is a comparison between capacity and requirements. Design and planning criteria provide the instruments for making this comparison.

Design criteria provide a quantitative description of a robust and redundant distribution system from a hydraulic point of view. Whenever existing capacity is found to be inadequate to meet design requirements, mitigation is proposed in the form of capital projects. Such projects should be considered as candidates for mitigation.

Planning criteria are collectively a quantitative and qualitative description of the anticipated service life of each system component. Whenever a system component is found to have simultaneously exceeded its service life and to have exhibited indications of poor condition, replacement is recommended. Such projects should be considered as candidates for replacement.

The conclusion of this chapter is a Capital Improvement Program (CIP) aimed at (1) resolving identified hydraulic issues and (2) cyclical replacement due to issues arising from age and condition. Candidates for mitigation and candidates for replacement have been prioritized by perceived urgency.

9.2 Supply Analysis

The adequacy of the combined sources of supply is subject to redundancy and emergency preparedness. Primary supply design criteria examine the adequacy of all sources to meet normal demands with a degree of redundancy. Secondary supply design criteria examine the system's ability to recover from an emergency event following depletion of emergency and fire storage.

9.2.1 Primary Supply Design Criteria

Primary design criteria related to supply state that there should be sufficient supply to meet MDD with the largest source out of service. **Table 9-1** provides supply capacity per the latest SCE pump efficiency tests and nominal interconnection capacity for imported sources.

Table 9-1 – Supply Analysis

Source	Supply Capacity (gpm)	Existing Conditions (gpm)	Future Conditions (gpm)
Baldwin Park Operable Unit (BPOU)*	2,500	2,500	2,500
LPVCWD (Sum of Interconnection Capacity)	7,100	7,100	7,100
Puente Valley Operable Unit (PVOU)°			1,500
Total Supply Capacity without Largest Source out of Service		2,500	4,000
Maximum Day Demand		2,373	2,492
Surplus (Deficit)		127	1,508

*Production from Well Nos. 2, 3 & 5 is limited to permitted capacity of the LPVCWD Treatment Facility.
°PVOU production water is a planned source to be supplied to LPVCWD (See **Appendix G**)

9.2.2 Secondary Supply Design Criteria

Secondary design criteria related to supply address refill capacity, which should be sufficiently adequate to refill emergency and fire storage within two days under MDD conditions. Emergency storage is equivalent to one day of MDD and fire storage represents the largest single fire flow requirement of 4,000 gpm for four hours. The total requirement is as follows:

$$Q = \frac{(MDD) * (24\ hours) + (4{,}000 gpm) * (4\ hours)}{48\ hours} + MDD$$

Table 9-2 provides a summary and calculation of the refill requirement.

Table 9-2 – Supply Emergency and Fire Refill Requirement

Period	Emergency Storage (MG)	Fire Storage (MG)	Total Refill Volume (MG)	Equivalent Refill Flow Rate (gpm)	MDD (gpm)	Total (gpm)
Existing	3.42	0.96	4.38	1,520	2,373	3,893
Future	3.59	0.96	4.55	1,579	2,492	4,071

Table 9-3 demonstrates the application of the secondary supply criteria.

Table 9-3– Supply Emergency and Fire Refill Analysis

Source/Demand	Supply Capacity (gpm)	Existing Conditions (gpm)	Future Conditions (gpm)
Baldwin Park Operable Unit (BPOU)	2,500	2,500	2,500
LPVCWD (Sum of Interconnection Capacity)	7,100	7,100	7,100
Puente Valley Operable Unit (PVOU)			1,500
Total Supply		9,600	11,100
Maximum Day Demand		3,893	4,071
Surplus (Deficit)		5,707	7,029

9.2.3 Potential Sources of Supply

Given that District has agreed to operate the Puente Valley Operable Unit Intermediate Zone (PVOU IZ) treatment facility, the District will receive fully treated water into its water system and will utilize this water as a back-up supply for the District and for neighboring water purveyors. Based on the current treatment facility design and project schedule, the District may be able to receive up to 1,500 gpm as a source of back-up supply by 2020.

9.2.4 Supply Recommendation

Application of primary supply design criteria indicates a slight surplus under existing and future conditions. The secondary design criteria related to supply indicated the refill capacity during an emergency has an adequate amount of supply with a surplus of over 7,000 gpm. Given these conditions and by applying the potential PVOU IZ water as a source of back-up supply to the list of sources, the District will have greater primary and secondary supply reliability.

9.3 Analysis of Storage Facilities

Per storage design criteria, minimum capacity is equivalent to the sum of emergency, operational and fire storage.

Emergency storage is one day of MDD.

$$V_{Existing\ Emergency} = \left(\frac{2{,}373 gallons}{minute}\right) * \left(\frac{60\ minutes}{1\ hour}\right) * (24\ hours) = 3.42\ MG$$

$$V_{Future\ Emergency} = \left(\frac{2{,}492 gallons}{minute}\right) * \left(\frac{60\ minutes}{1\ hour}\right) * (24\ hours) = 3.59\ MG$$

Operational storage is 30% of one day of MDD.

$$V_{Existing\ Operational} = (0.3) * (3.42\ MG) = 1.03\ MG$$

$$V_{Future\ Operational} = (0.3) * (3.59\ MG) = 1.08\ MG$$

Fire Storage is the requirement for one maximum event:

$$\left(\frac{4{,}000 gallons}{minute}\right) * \left(\frac{60\ minutes}{1\ hour}\right) * (4\ hours) = 0.96\ MG$$

Both the LPVCWD and CIWS systems are considered to be widely interconnected and as a result may share storage. Storage in the Industry Hills Reservoirs is available to all Zones in both systems and water can automatically move to lower Zones as needed to supplement storage reserves in lower zones if the emergency and fire flow reserves were to be depleted from those zones. As a result, Industry Hills reservoirs are considered in this analysis. **Table 9-4** provides the storage capacity in the Zone served and volume.

Table 9-4 – Existing Storage Capacity

Reservoir Name	Zone Served	Nominal Volume (MG)
Hudson	Zone 1	0.1
Main Street No. 1	Zone 2	3.0
Main Street No. 2	Zone 2	1.8
Industry Hills No. 1	Industry Hills	1.4*
Industry Hills No. 2	Industry Hills	1.4*
Total		7.7

*Capacity is shared with CIWS. Only surplus storage can be allocated to LPVCWD.

Table 9-5 summarizes and compares the calculations for available and required storage.

Table 9-5 – Storage Analysis

Period	Storage Requirement Type (MG)			Total Requirement (MG)	Total Available (MG)	Surplus (MG)
	Emergency	Operational	Fire			
Existing	3.42	1.03	0.96	5.41	7.7	2.29
Future	3.59	1.08	0.96	5.63	7.7	2.07

9.3.1 Storage Recommendation

Based on the water supply agreement in place between LPVCWD and CIWS, the systems are considered to be widely interconnected, and as a result, have adequate storage supply.

9.4 Analysis of Booster Facilities

Per supply design criteria, there should be sufficient booster pumping capacity in each pressurized zone without gravity storage to meet (1) combined production capacity of maximum day demand with fire flow at 20 psi, and (2) PHD at a minimum system pressure of 40 psi. When gravity storage is present, the booster pump must have the capacity to supply maximum day demand when the largest pump is out of service.

Note that the system's capacity in Zone 1, 2, 3 and 4 is interdependent on booster pumping capacity and pipeline efficiency. With this mind, the following is a determination of whether booster capacity can meet minimum requirements.

9.4.1 Pressure Zone 1 Booster Capacity (Hudson Booster Station)

There are three booster pumps at the Hudson Booster Station which serve Zone 1 and also serve the entire dependent demands of Zone 2, 3 and 4. Water is pumped from the Hudson Reservoir through Zone 1 to the Main Street Reservoirs. For redundancy, the capacity of one of the pumps is calculated and the sum of the capacities of the remaining two pumps is utilized to determine the adequacy of the booster station. The production of two pumps at the Hudson Booster Station is 2,500 gpm. The dependent demand of the Station under near term conditions is 2,492 gpm. The Hudson Booster station can achieve the MDD requirement for the system.

The highest water surface elevation in the Main Street Reservoir is at 488 feet.

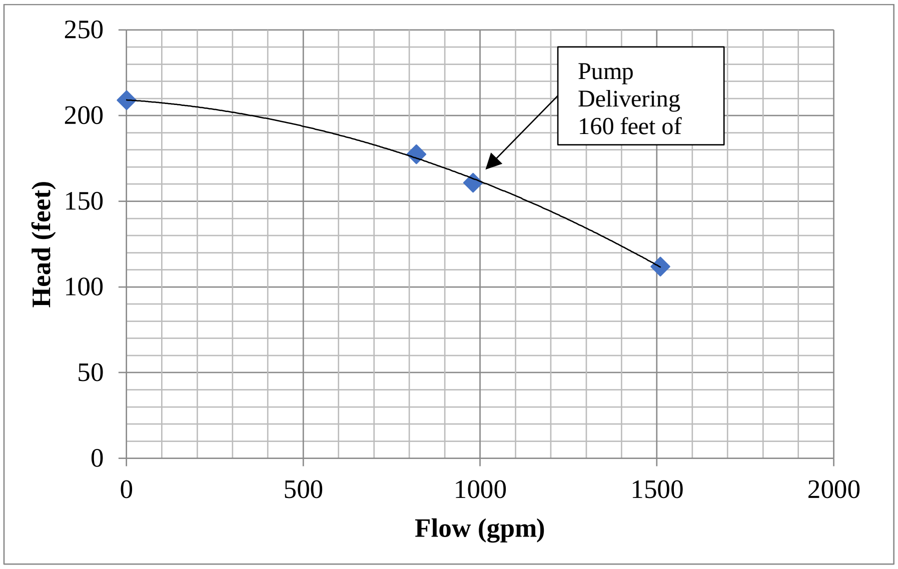
Assuming the water surface in Hudson Reservoir is 328 feet, the pump should add a minimum of 160 feet of head not considering frictional head losses:

$$488\ feet - 328\ feet = 160\ feet$$

The dependent MDD to the Hudson Booster Station to supply the demand for the entire LPVCWD system is 2,492 gpm.

Figure 9-1 shows the available flow of 975 gpm when Pump 1 is delivering 160 feet of head. Pump curves for Hudson have been adjusted based on recent Edison hydraulic efficiency test results.

Figure 9-1 – Hudson Pump vs. MDD Requirements



Two pumps alone producing 1,950 gpm cannot achieve the dependent MDD requirement of 2,492 gpm in Zone 1 and dependent Zones.

9.4.2 Pressure Zone 2 Booster Capacity

There are three booster pumps that serve Zone 2. Since the design flow and head of each pump are different, all three pump capacities are calculated to check that they are able to handle all demand conditions.

The highest service elevation in Zone 2 is at 541 feet.

MDD + FF

To achieve 20 psi fire flow residual pressure at this location, the hydraulic gradient should be at least 587 feet:

$$541\ feet + \left(\frac{20\ lbs}{in^2}\right)\left(\frac{12\ in}{foot}\right)^2\left(\frac{ft^3}{62.4\ lbs}\right) \cong 587\ feet$$

Assuming the water surface in Main Street Reservoir is 469 feet, the Pumps should add 113 feet of head:

$$587\ feet - 469\ feet = 113 feet$$

MDD plus fire flow in Zone 2 is 2,092 gpm including the dependent MDD of 117 gpm for Zone 3 (see Section 9.4.3). The fire flow requirement in Zone 2 is 1,250 gpm.

Figure 9-2 shows the available flow of 1,050 gpm for Pump No. 1 when delivering 113 feet of head. **Figure 9-3** shows the available flow of 1,225 gpm when Pump No. 3 is delivering 113 feet of head (pump curves have been adjusted based on most recent SCE efficiency test).

Figure 9-2 – Pump 1 vs. MDD + FF Requirements for Zone 2

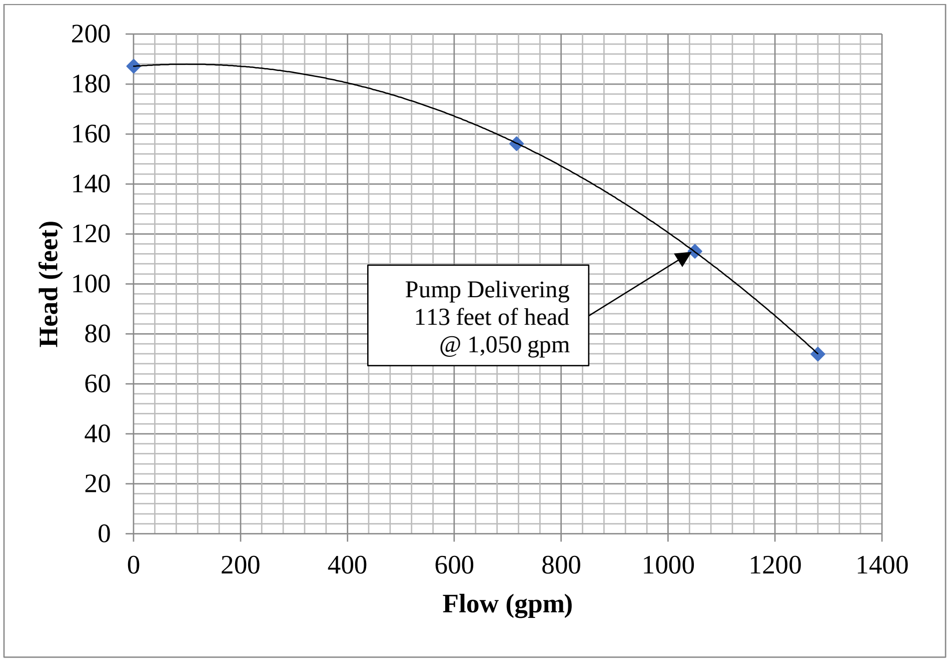
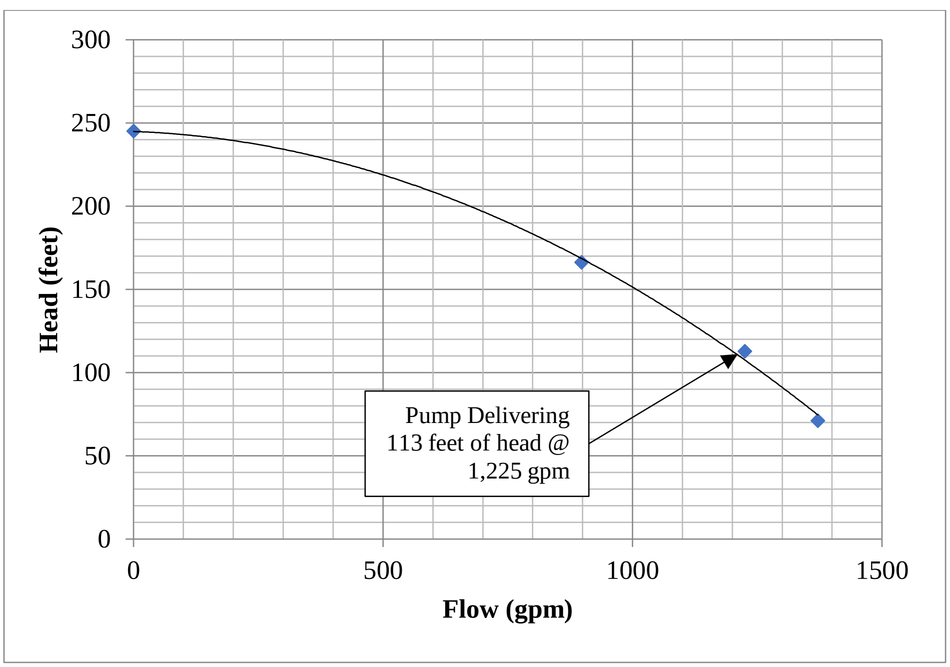


Figure 9-3 – Pump 3 vs. MDD + FF Requirements for Zone 2



The two smaller pumps producing 2,275 gpm can achieve the MDD+FF requirements of 2,092 gpm in Zone 2 when considering the largest pump out of service.

PHD

To achieve 40 psi fire flow residual pressure at this location, the hydraulic gradient should be at least 633 feet:

$$541\ feet + \left(\frac{40\ lbs}{in^2}\right)\left(\frac{12\ in}{foot}\right)^2\left(\frac{ft^3}{62.4\ lbs}\right) \cong 633\ feet$$

Assuming the water surface in Main Street Reservoir is 469 feet, Pump should add 164 feet of head:

$$633\ feet - 469\ feet = 164\ feet$$

PHD in Zone 2 is 1,023 gpm.

Figure 9-4 shows the available flow of 650 gpm for Pump No. 1 when delivering 164 feet of head.

Figure 9-5 shows the available flow of 925 gpm for Pump No. 3 when delivering 164 feet of head. Two pumps can achieve the PHD requirement in Zone 2.

Figure 9-4 – Pump 1 vs. PHD Requirements for Zone 2

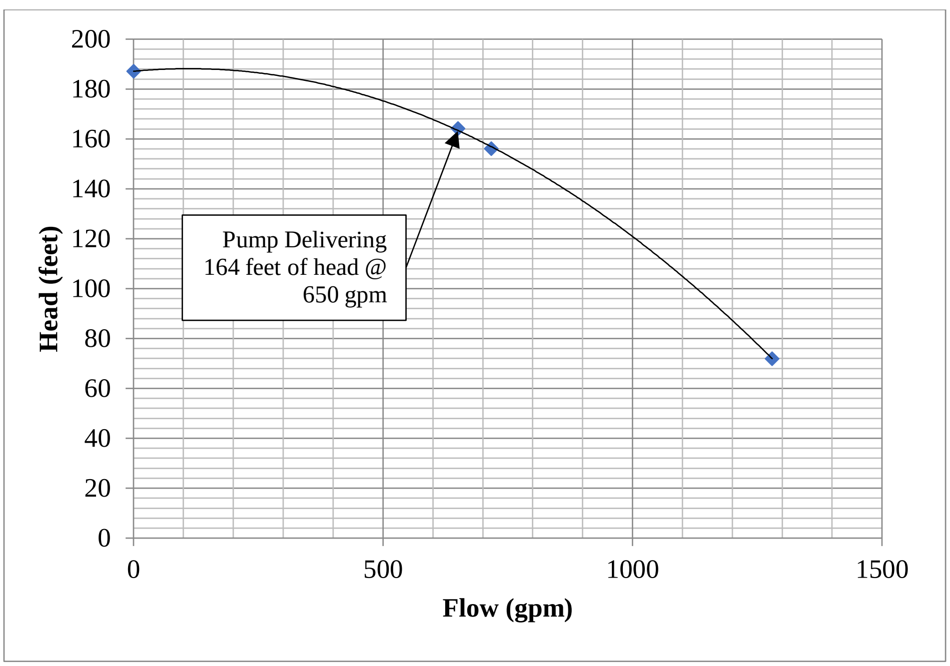
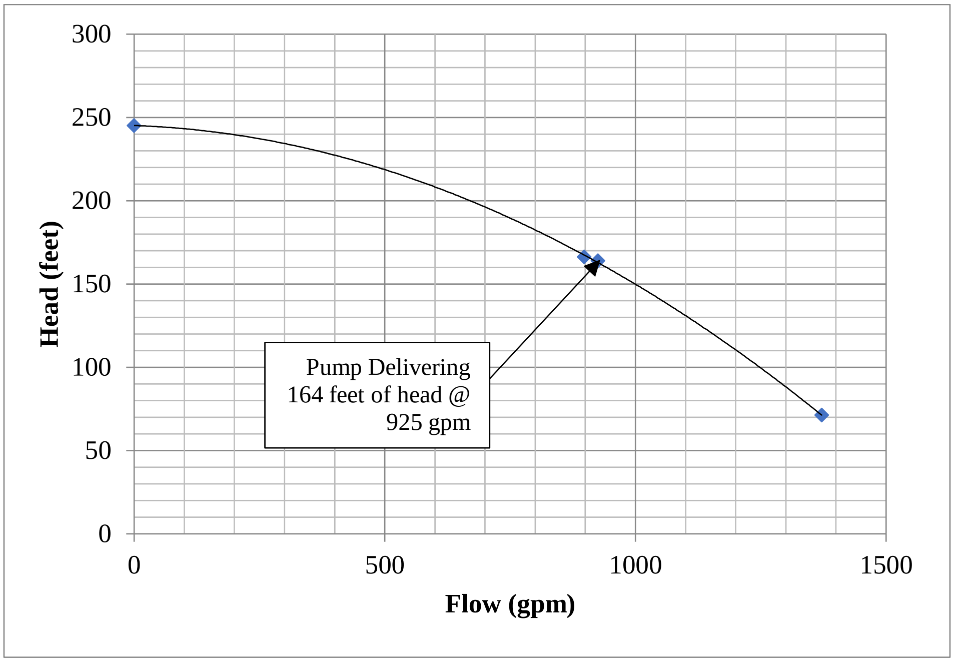


Figure 9-5 – Pump 3 vs. PHD Requirements for Zone 2



9.4.3 Pressure Zone 3 Booster Capacity

There are two booster pumps in Zone 3. Both pumps are normally operated to replenish the Industry Hills Reservoirs to replace the water used by LPVCWD in Zone 3. The capacity of each pump is calculated to check that it is able to handle the anticipated demand conditions.

The highest water surface elevation in the Industry Hills Reservoirs is at 777 feet.

MDD

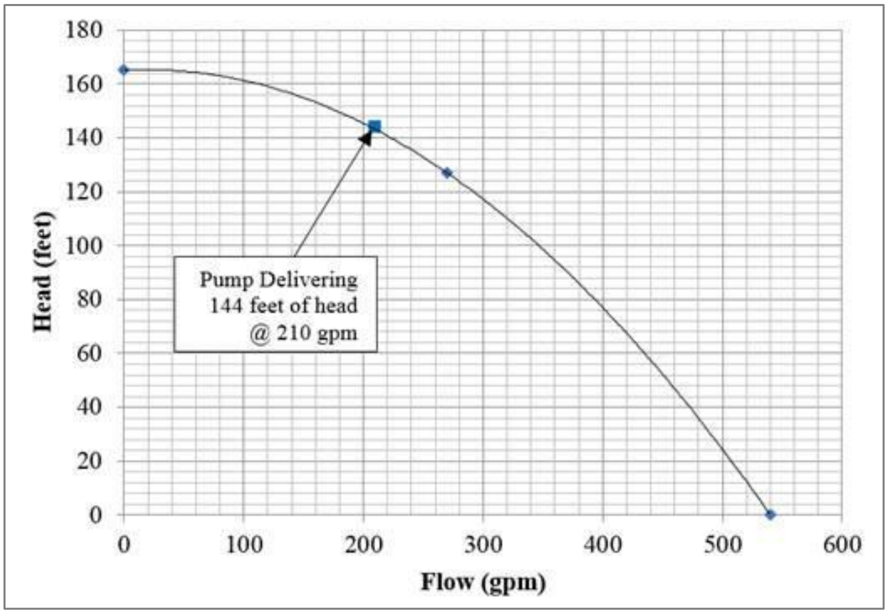
Assuming the water surface in Zone 2 is 633 feet, the Pump should add 144 feet of head:

$$777\ feet - 633\ feet = 144\ feet$$

MDD in Zone 3 is 39 gpm.

Figure 9-6 shows the available flow of 210 gpm for Pump 1 when delivering 144 feet of head.

Figure 9-6 – Pump 1 vs. MDD Requirement for Zone 3



The small pump can achieve the MDD requirement in Zone 3. The Zone 3 booster pump station is operated manually to replenish water in the Industry Hills Reservoirs. Water is utilized in Zone 3 during the day with supply from the Industry Hills Reservoirs, water is subsequently replenished as needed by the Zone 3 booster pump station. As a result, Zone 3 is only required to replenish one day of 39 gpm in an 8-hour period. This equates to 117 gpm flow. In light of this the existing booster pump can achieve the requirements for Zone 3. Fire flow to Zone 3 is always served by gravity through the Industry Hills Reservoirs.

9.4.4 Pressure Zone 4 Booster Capacity

There are two booster pumps in Zone 4. For redundancy, the capacity of one of the pumps is calculated and the sum of the two capacities is utilized to check that they are able to handle all demand conditions. Zone 4 is also served by the largest pump of the Zone 2 booster station. If pressure loss is experienced in Zone 4, a control valve on the discharge of this Zone 2 pump is opened to initiate production to serve fire flows in Zone 4.

The highest service elevation in Zone 4 is at 630 feet.

MDD + FF

To achieve 20 psi fire flow residual pressure at this location, the hydraulic gradient should be at least 676 feet:

$$630\ feet + \left(\frac{20\ lbs}{in^2}\right)\left(\frac{12\ in}{foot}\right)^2\left(\frac{ft^3}{62.4\ lbs}\right) \cong 676\ feet$$

Assuming water surface in Main Street Reservoir is 469 feet, Pump should add 207 feet of head:

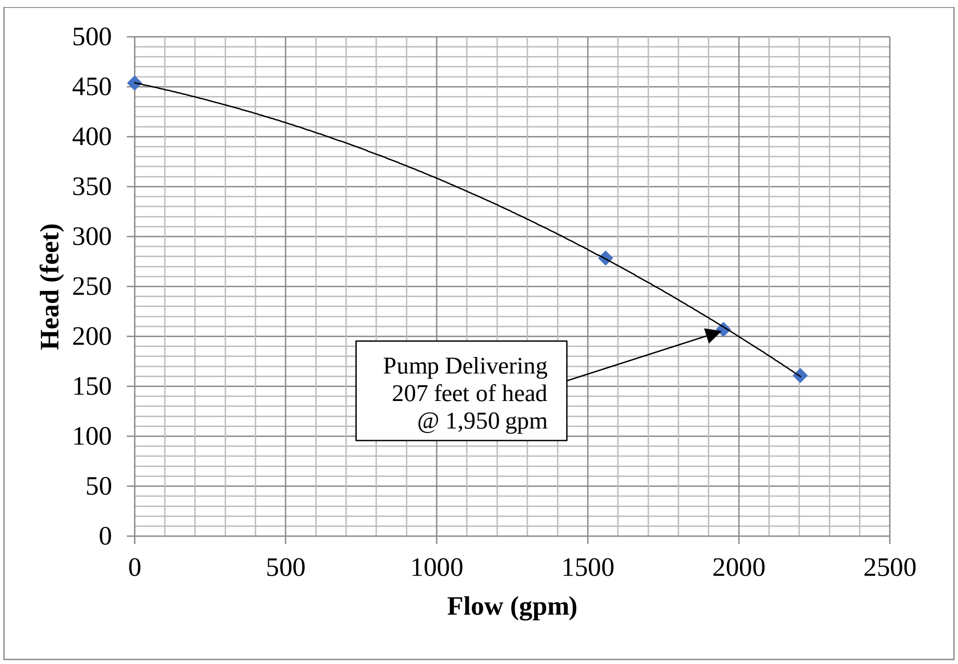
$$676\ feet - 469\ feet = 207\ feet$$

MDD plus fire flow in Zone 4 is 1,556gpm, (56 + 1,500) gpm.

Figure 9-7 shows the available flow of 1,950 gpm when Zone 2 Pump No. 2 is delivering 207 feet of head.

The Zone 2 Pump No. 2 can achieve the FF+MDD requirement in Zone 4. Note that Zone 4 piping has been configured with an interconnect to allow a redundant supply of water from the Industry Hills Reservoirs by way of the Industry Hills Booster Station No. 3 and San Jose pressure regulating stations to ensure that if pressure falls below a certain set point in Zone 2 this redundant supply would provide fire flow to Zone 4.

Figure 9-7 – Pump 2 vs. MDD + FF Requirement for Zone 4



PHD

To achieve 40 psi fire flow residual pressure at this location, the hydraulic gradient should be at least 633 feet:

$$630\ feet + \left(\frac{40\ lbs}{in^2}\right)\left(\frac{12\ in}{foot}\right)^2\left(\frac{ft^3}{62.4\ lbs}\right) \cong 723\ feet$$

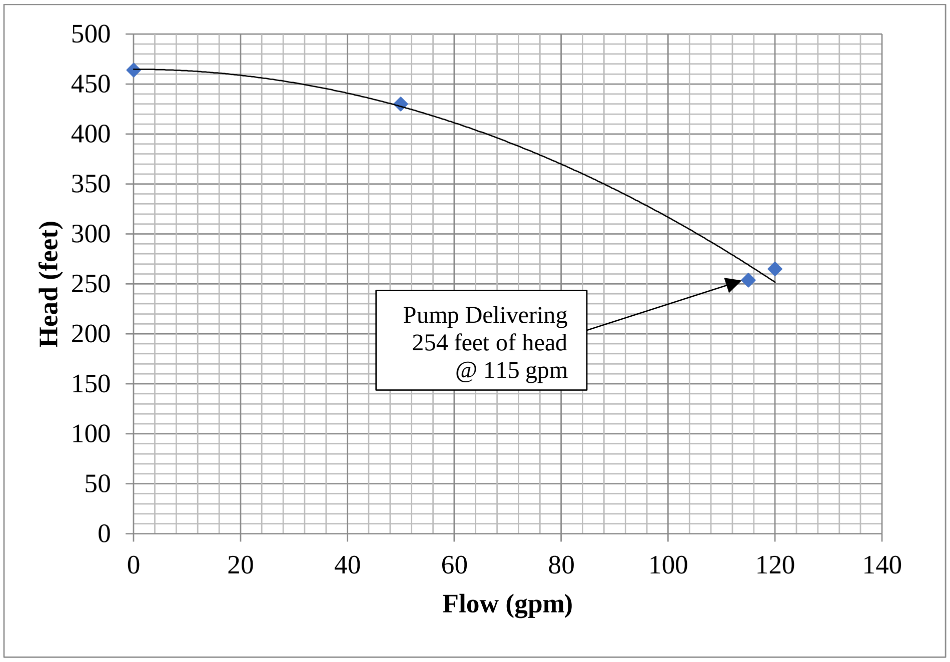
Assuming the water surface in the Main Street Reservoir is 469 feet, Pump should add 256 feet of head:

$$723\ feet - 469\ feet = 254\ feet$$

PHD in Zone 4 is 86 gpm.

Figure 9-8 shows the available flow of 115 gpm from one of the Zone 4 pumps while meeting 254 feet of head. One pump can achieve the PHD requirement in Zone 4.

Figure 9-8 – Zone 4 Booster Pump vs. PHD Requirement



9.5 Analysis of Existing Distribution System

The primary function of the distribution system is to carry supply to where it is needed. In most cases, fire flow demand is the governing factor in sizing pipelines. The results of a MDD plus Fire Flow analysis indicated a number of hydrants (or groups of hydrants) that could not meet the allocated fire flow capacity. These deficiencies have been categorized by the magnitude of the fire flow demand related to the following land uses:

Fire Flow Demand (gpm)	Land Use
1,250	Single Family Residential
3,000	Multi-family Residential, Commercial
4,000	Industrial and Institutional

Note that fire flow demands listed above are typical for the land uses indicated under the current standards provided by the Fire Marshal for new construction, land subdivision or water system upgrade. Fire flow requirements for individual parcels may be higher or lower than the listed demands at the discretion of the Fire Marshal. Allowances for reduced fire flow requirements include onsite fire sprinklers, use of fire retardant construction materials and sufficient separation between structures. The need for increased fire flow requirements may include multiple stories, large floor areas, high occupancy and high density.

A fire flow analysis means that a fire flow event was simulated at every hydrant location in the Water Model under MDD steady state conditions. The Water Model returned static pressure, residual pressure and available flow for each hydrant. The significant result is the available flow at 20 psi residuals which generally represents the performance the hydrant is capable of as a worst-case scenario. Exhibits were created and will be provided in **Appendix F** showing possible improvements that can rectify the following fire flow deficiencies in the future.

As permitted by regulation, fire flows in excess of 2,500 gpm may be met by up to two hydrants flowing simultaneously, and fire flows in excess of 3,500 gpm may be met by up to three hydrants flowing simultaneously. Any hydrant that could not individually meet the assigned fire flow requirement was retested using a multi-hydrant fire flow simulation.

9.5.1 Industrial Fire Flow Deficiency

Fire flow demand for industrial land use is set at 4,000 gpm.

Table 9-6 provides a list of hydrants grouped into areas that could not meet industrial fire flow requirements, prioritized by available flow at 20 psi residual pressure with up to three hydrants flowing simultaneously.

Table 9-6 – Industrial Fire Flow Deficiencies

Hydrant Location	Pressure Zone	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
5th Street, south of Workman Street	1	41	1,099	Existing Hydrant is off an existing 6-inch pipeline

The primary reason for this type of deficiency can be associated to undersized and/or dead-end mains serving the area. For this specific case, the fire hydrant is connected to a 6-inch main located on 5th Street in front of the Workman Elementary School and currently does not meet industrial/institution fire flow requirements. In addition, there is no other fire hydrant in the area to group within 300 feet. It is recommended to either upsize the existing 6-inch pipeline on 5th Street or install a new fire hydrant off the existing 16-inch pipeline on Main Street south of the elementary school.

9.5.2 Multi-Family Residential/Commercial Fire Flow Deficiencies

Fire flow demand for commercial land use is set at 3,000 gpm.

Table 9-7 provides a list of hydrants grouped into areas that could not meet multi-family residential or commercial fire flow requirements, prioritized by available flow at 20 psi residual pressure with up to two hydrants flowing simultaneously.

Table 9-7 – Commercial Fire Flow Deficiencies

Hydrant Location	Pressure Zone	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
923 N Hacienda Blvd	1	60	1,071	Recommend upsizing pipeline
892 N Hacienda Blvd	1	60	1,144	Recommend upsizing pipeline

The primary reason for this type of deficiency can be associated to undersized and/or dead-end mains serving the area. Due to the location of these deficiencies and the cost to implement a pipeline replacement solution, the proposed improvement should include an administrative and capital solution that consist of constructing a Fire Hydrant service from the existing SWS 12" water main on the opposite side of Hacienda to be located in front of the subject commercial use. In this manner, sufficient fire flow will be provided through use of grouping one of LPVCWD's existing fire hydrants with a new SWS hydrant to achieve the fire flow requirements. This improvement (CIP #13) will require coordination and approval from SWS.

9.5.3 Single Family Residential Fire Flow Deficiencies

Fire flow demand for single-family residential land use is set at 1,250 gpm.

Table 9-8 provides a list of hydrants that were unable to meet single family residential fire flow requirements, prioritized by available flow at 20 psi residual pressure.

Table 9-8 – Single Family Residential Fire Flow Deficiencies

Hydrant Location	Pressure Zone	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
Rexham Ave	1	47	953	Recommend upsizing pipeline or creating a hydraulic loop
Inyo St, East of Rexham Ave	1	47	1,247	Recommend upsizing pipeline or creating a hydraulic loop
Banbridge Ave and Rorimer St	1	45	637	Recommend upsizing pipeline or creating a hydraulic loop
Rorimer St, east of Waringwood Rd	1	42	824	Recommend upsizing pipeline or creating a hydraulic loop
Wegman Dr, east of Waringwood Rd	1	35	641	Recommend upsizing pipeline or creating a hydraulic loop
S Baja Ave, south of Inyo St	1	45	1,148	Recommend upsizing pipeline or creating a hydraulic loop
S Dial Ave, south of Inyo St	1	47	796	Recommend upsizing pipeline or creating a hydraulic loop
S Dalesford Dr, north of Inyo St	1	34	760	Recommend upsizing pipeline or creating a hydraulic loop
Bamboo St, north of Inyo St	1	34	786	Recommend upsizing pipeline or creating a hydraulic loop
S Appleblossom, north of Inyo St	1	36	1,241	Recommend upsizing pipeline or creating a hydraulic loop
693 Santo Oro Ave	1	59	698	Recommend upsizing pipeline or creating a hydraulic loop
674 Gaylawn Ct	1	59	709	Recommend upsizing pipeline or creating a hydraulic loop
15602 Temple Ave	1	56	728	Recommend upsizing pipeline or creating a hydraulic loop
16266 Bamboo St	2	145	1,222	Recommend upsizing pipeline
16342 Bamboo St	2	148	1,117	Recommend upsizing pipeline

The primary reason for this type of deficiency can be associated to undersized and/or dead-end mains serving the area. Most of these can be improved by creating hydraulic loops, upsizing existing pipelines and/or the addition of a pressure sustaining/regulating valve.

9.6 Proposed Improvements for Deficiencies

After discussing and receiving input from LPVCWD's staff, the following proposed improvements were created and analyzed to alleviate the fire flow deficiencies within LPVCWD's system.

9.6.1 5th Street and Workman Street (CIP#1)

Table 9-9 provides the updated findings of the industrial fire flow deficiency found in

Table 9-8 after incorporating a proposed improvement into the Water Model.

Table 9-9 – Industrial Fire Flow Deficiencies with Improvements

Hydrant Location	Pressure Zone	Exhibit No.	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
5th Street and NE corner of 5th Street and Main St	1	1	41 - 44	6,090	Fire Flow is sufficient by upsizing to an 8-inch main and installing 2 new fire hydrants

As shown in **Figure 9-9 (**also shown in **Exhibit 1** in **Appendix F**), it is recommended to upsize the existing 6-inch main (~510 feet) in 5th Street to an 8-inch main and install two new fire hydrants. One hydrant would be off the new upsized 8-inch main in 5th Street and installed in front of Workman Elementary School. The second fire hydrant would be off the existing 16-inch main on Main Street and installed at the northeast corner of 5th Street and Main Street. By running the hydrants simultaneously, the available fire flow would exceed 4,000 gpm.

Figure 9-9 –5th Street and Main Street Improvements (CIP#1)

9.6.2 Improvements on Ferrero Ln and Rorimer St (CIP#2)

Table 9-10 provides the updated findings of the single family residential fire flow deficiencies found in **Table 9-8** after incorporating proposed improvements into the Water Model.

Table 9-10 – Single Family Residential Fire Flow Deficiencies with Improvements on Ferrero Ln and Rorimer St

Hydrant Location	Pressure Zone	Exhibit No.	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
Rexham Ave	1	2	56	1,316	Fire Flow Available is sufficient with the installation of the PRV and waterline upsize
Inyo St, East of Rexham Ave	1	2	56	2,037	Fire Flow Available is sufficient with the installation of the PRV and waterline upsize
Banbridge Ave and Rorimer St	1	2	57	1,374	Fire Flow Available is sufficient with the installation of the PRV and waterline upsize
Rorimer St, east of Waringwood Rd	1	2	54	1,820	Fire Flow Available is sufficient with the installation of the PRV and waterline upsize
Wegman Dr, east of Waringwood Rd	1	2	57	1,620	Fire Flow Available is sufficient with the installation of the PRV and waterline upsize

By upsizing the existing 4-inch pipeline to 6-inch along Rorimer St (~605 feet) east of Waringwood Road and installing a pressure sustaining/regulating valve on S Ferrero Lane, the hydraulic loop capacities increase within the area. All 4-inch wharf heads would be replaced by 6-inch fire hydrants. With these improvements, the fire hydrants within the area will be able to exceed the available fire flow requirement of 1,250 gpm as shown in **Figure 9-10** (also shown as **Exhibit 2** in **Appendix F**).

Figure 9-10 –Ferrero Lane and Rorimer Street Improvements (CIP#2)

9.6.3 Bamboo Street and Dalesford Drive Improvements (CIP#3)

Table 9-11 provides the updated findings of the single family residential fire flow deficiencies found in **Table 9-8** after incorporating proposed improvements into the Water Model.

Table 9-11 – Single Family Residential Fire Flow Deficiencies North of Inyo St

Hydrant Location	Pressure Zone	Exhibit No.	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
S Dalesford Dr, north of Inyo St	1	3	36	1,504	Fire Flow Available is sufficient with the installation of the PRV and waterline upsize
Bamboo St, north of Inyo St	1	3	45	1,815	Fire Flow Available is sufficient with the installation of the PRV and waterline upsize

By upsizing the existing 6-inch pipeline to 8-inch along Dalesford Drive (~335 feet) north of Inyo Street and installing a pressure sustaining/regulating valve on Bamboo Street, the hydraulic loop capacities increase within the area. All 4-inch wharf heads would be replaced by 6-inch fire hydrants. With these improvements, the fire hydrants within the area will be able to exceed the available fire flow requirement of 1,250 gpm as shown in **Figure 9-11** (also shown as **Exhibit 3** in **Appendix F**).

Figure 9-11 – Bamboo Street and Dalesford Drive Improvements (CIP#3)

9.6.4 Improvements on Inyo St and Common Ave (CIP#4)

Table 9-12 provides the updated findings of the single family residential fire flow deficiencies found in **Table 9-8** after incorporating proposed improvements into the Water Model.

Table 9-12 – Single Family Residential Fire Flow Deficiencies Improvements on Inyo St and Common Ave

Hydrant Location	Pressure Zone	Exhibit No.	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
S Baja Ave, south of Inyo St	1	4	46	1,573	Fire Flow Available is sufficient by upsizing waterlines
S Dial Ave, south of Inyo St	1	4	48	1,415	Fire Flow Available is sufficient by upsizing waterlines
S Appleblossom, north of Inyo St	1	4	37	1,321	Fire Flow Available is sufficient by upsizing waterlines

By upsizing the existing 4-inch pipeline to 8-inch along Common Avenue (~835 feet) between Appleblossom Street and Central Avenue and in Inyo Street (~735 feet) from Common Ave going eastward to tie into the existing 8-inch, the hydraulic loop capacities increase within the area. All 4-inch wharf heads would also need to be replaced with 6-inch fire hydrants. With these improvements, the fire hydrants within the area will be able to exceed the available fire flow requirement of 1,250 gpm as shown in **Figure 9-12** (also shown as **Exhibit 4** in **Appendix F**).

Figure 9-12 – Inyo St and Common Ave Improvements (CIP#4)

9.6.5 Improvements on N Hacienda Blvd, North of Temple Ave (CIP#5)

Table 9-13 provides the updated findings of the single family residential fire flow deficiencies found in **Table 9-8** after incorporating proposed improvements into the Water Model.

Table 9-13 – Single Family Residential Fire Flow Deficiencies Improvements on N Hacienda Blvd, North of Temple Ave

Hydrant Location	Pressure Zone	Exhibit No.	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
693 Santo Oro Ave	1	5	60	2,253	Fire Flow Available is sufficient by creating a hydraulic loop
674 Gaylawn Ct	1	5	60	2,040	Fire Flow Available is sufficient by creating a hydraulic loop
15602 Temple Ave	1	5	57	1,878	Fire Flow Available is sufficient by creating a hydraulic loop

By adding an estimate of 550 feet of 8-inch pipeline in N Hacienda Blvd from Santa Oro Ave up towards Sierra Vista Ct, a hydraulic loop is formed. This hydraulic loop would increase the available fire flow within the streets of Santo Oro Ave, Temple Ave, and Gaylawn Rd thus exceeding the available fire flow requirement of 1,250 gpm per single hydrant as shown in **Figure 9-13** (also shown as **Exhibit 5** in **Appendix F**).

Figure 9-13 –N Hacienda Blvd, north of Temple Ave Improvement (CIP#5)

9.6.6 Improvements on Bamboo St (CIP#6)

Table 9-14 provides the updated findings of the single family residential fire flow deficiencies found in **Table 9-8** after incorporating proposed improvements into the Water Model.

Table 9-14 – Single Family Residential Fire Flow Deficiencies Improvements on Bamboo St

Hydrant Location	Pressure Zone	Exhibit No.	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
16266 Bamboo St	2	6	98	1,821	Fire Flow Available is sufficient by upsizing waterlines
16342 Bamboo St	2	6	101	1,340	Fire Flow Available is sufficient by upsizing waterlines

By upsizing the existing 6-inch pipeline along Bamboo Street (~ 1,555 feet) and Main Street (~160 feet) to 8-inch pipeline, the deficient fire hydrants will be able to reach the available fire flow requirement of 1,250 gpm as shown in **Figure 9-14** (also shown as **Exhibit 6** in **Appendix F**).

Figure 9-14 – Bamboo Street Improvements (CIP#6)

9.7 Evaluation Based on Condition and Age

All components of the distribution system have a finite service life. Individual components may wear out prematurely or outlive their recommended life cycle; however, for planning purposes average life cycles should be considered when budgeting replacement costs. Care should be taken to replace inefficient, worn or damaged infrastructure in a timely manner to avoid excessive repair costs and other vulnerabilities.

Table 9-15 provides a methodology for identifying and corroborating cyclical replacement. Prior to replacement (or maintenance as indicated), both criteria should be met. The interval criterion represents the age and the indication criterion represents condition. Any component exceeding its recommended age that also exhibits poor condition should be considered a string candidate for replacement.

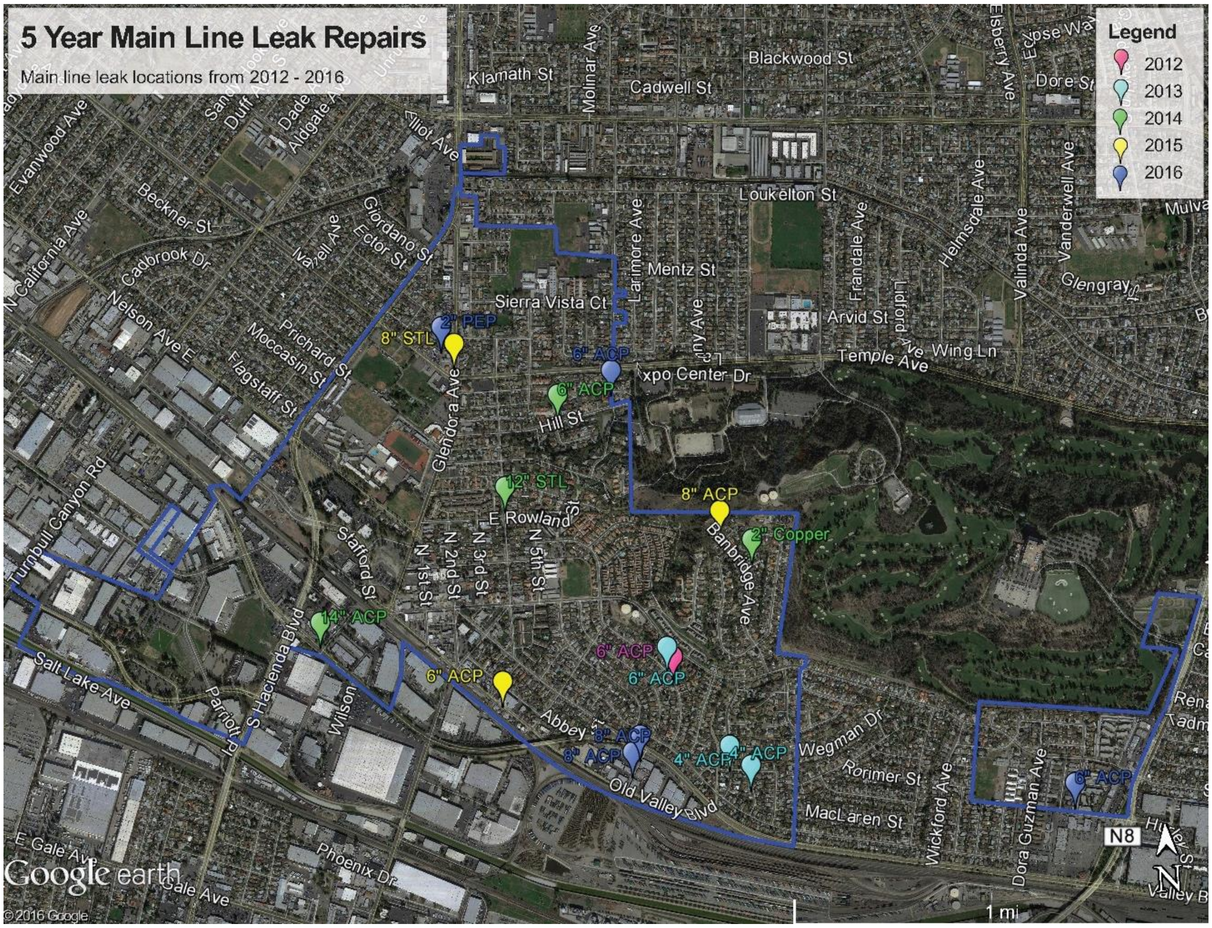
Table 9-15 – Infrastructure Replacement Criteria

Component	Interval (years)	Indication
Pipeline	AWWA	Frequent repair history, excessive energy losses
Pump/Motor Overhaul	15	Drop in efficiency below 65%
Pump/Motor Replacement	30	Frequent repair history, drop in efficiency
Control Valve Overhaul	25	Leaks, poor response, frequent repairs
Tank Recoating	20	Evidence of corrosion
Tank Replacement	80	Frequency/extent of repair history
Well Refurbishment/Replacement	50	Decline in effective capacity

9.7.1 Watermain Pipeline Evaluation based on Conditions

As stated above, all components of the distribution system have a finite service life and care should be taken to replace inefficient, worn or damaged infrastructure in a timely manner to avoid excessive repair costs and other vulnerabilities. Currently, the District has a procedure in place to document all leaks in a database for purposes of keeping adequate records and for the benefit of data analysis. Analyzing a 5-year data sample, **Figure 9-15** provides an overview assessment of current conditions of watermains in the distribution system.

Figure 9-15 – Watermain Leak Repairs (2012-2016)



9.7.1.1 Watermain Pipeline Condition Recommendations

Based on the data observed on **Figure 9-15**, the data plotted shows no indication of areas with hot spots or a specific trend in a single water main that has multiple leaks. As a result, there is no recommendation to add a watermain(s) to the list of proposed Capital Improvements based on condition alone.

9.7.2 Service Line Evaluation Based on Conditions

As previously mentioned, the District has a procedure in place to document all leaks in a database for purposes of keeping adequate records and for the benefit of data analysis. Analyzing a 5-year data sample, **Table 9-16** provides an overview assessment of service line repairs and service line replacements performed in the distribution system.

Table 9-16 – Service Line Leak Repairs and Replacements (2012-2016)

SERVICE LINE REPAIRS						
Type	**2012**	**2013**	**2014**	**2015**	**2016**	**5 Yr Total**
Copper	1	4	7	1	4	17
Galvanized	1	0	0	0	0	1
PEP	0	2	1	2	1	6
Totals	2	6	8	3	5	24
SERVICE LINE REPLACEMENTS						
Type	**2012**	**2013**	**2014**	**2015**	**2016**	**5 Yr Total**
Copper	0	0	2	2	6	10
Galvanized	9	6	5	2	0	22
PEP	10	15	20	17	15	77
Totals	19	21	27	21	21	109

9.7.2.1 Service Line Condition Recommendations (CIP#7)

Based on the data observed on **Table 9-16**, the data listed identifies that galvanized and PEP service lines fail more commonly and need replacement. In addition, analysis of this data also identified two hot spot leak areas in the District. The first area of concern is a single 2” service that is approximately 250 ft. in length and composed of a combination of PEP and Galvanized pipe. The service has had repeated leaks on different areas of the service. In addition, senior personnel have also commented on additional leak repairs on this service line prior to 2012. As a result, it is recommended that the 2” service line located west of the intersection of Glendora Ave. and Temple Ave. be replaced with a 2” Copper service line as shown in **Figure 9-16**.

The second area of concern is a group of leaks located on Main Street. However, after reviewing service line replacement records and gathering input from senior personnel, it was previously identified that a group of service lines feeding a tract of condos in this area posed repeated leaks. As a result, the District initiated a service replacement program to replace all the PEP services feeding these condos with copper services.

Figure 9-16 – Proposed 2" Copper Service Line on Temple Ave. and Glendora Ave (CIP # 7)

9.7.3 Watermain Pipeline Replacement Based on Age

In 2012, the American Water Works Association (AWWA) published a report on water pipeline replacement called Buried No Longer: Confronting America's Water Infrastructure Challenge. The report suggests that Asbestos-Cement (AC) and Ductile Iron (DI) pipe in the western United States has average service life of 75 and 110 years. Statistically speaking, this means half of all ACP and DIP last longer than 75 and 110 years and half are replaced before those ages. The largest portion of pipe materials used in the LPVCWD system is ACP (66.3%) and DIP (7.2%).

This implies that once the LPVCWD distribution system is mature, an average of 6,800 feet of ACP and 1,300 feet of DIP replacement should be scheduled per year (or 68,000 feet and 13,000 feet over a 10-year period):

However, the LPVCWD distribution system is a comparatively young system and no pipelines are more than 75 and 110-years.

It is estimated LPVCWD's distribution system will reach maturity in 18 years for ACP and 42 years for DIP, at which time a regular and vigorous replacement program should be implemented. Until then, a more moderate pipeline replacement program is recommended. Consider the following:

- No plan to replace DIP
- No pipe age and condition issues in 2016
- Distribution system maturity will occur in 18 years (i.e. 2034), at which time a replacement schedule of 6,800 feet per year is required indefinitely.
- Using a straight-line projection, LPVCWD should consider a pipe replacement that starts at zero in 2016 and increases by 380 feet per year until 2034:

$$\frac{6{,}800\ feet\ per\ year}{2034 - 2016} \cong 380\ feet\ per\ year$$

Over the next ten years, this approach implies replacement of 17,100 feet of pipe, as shown in **Table 9-17**.

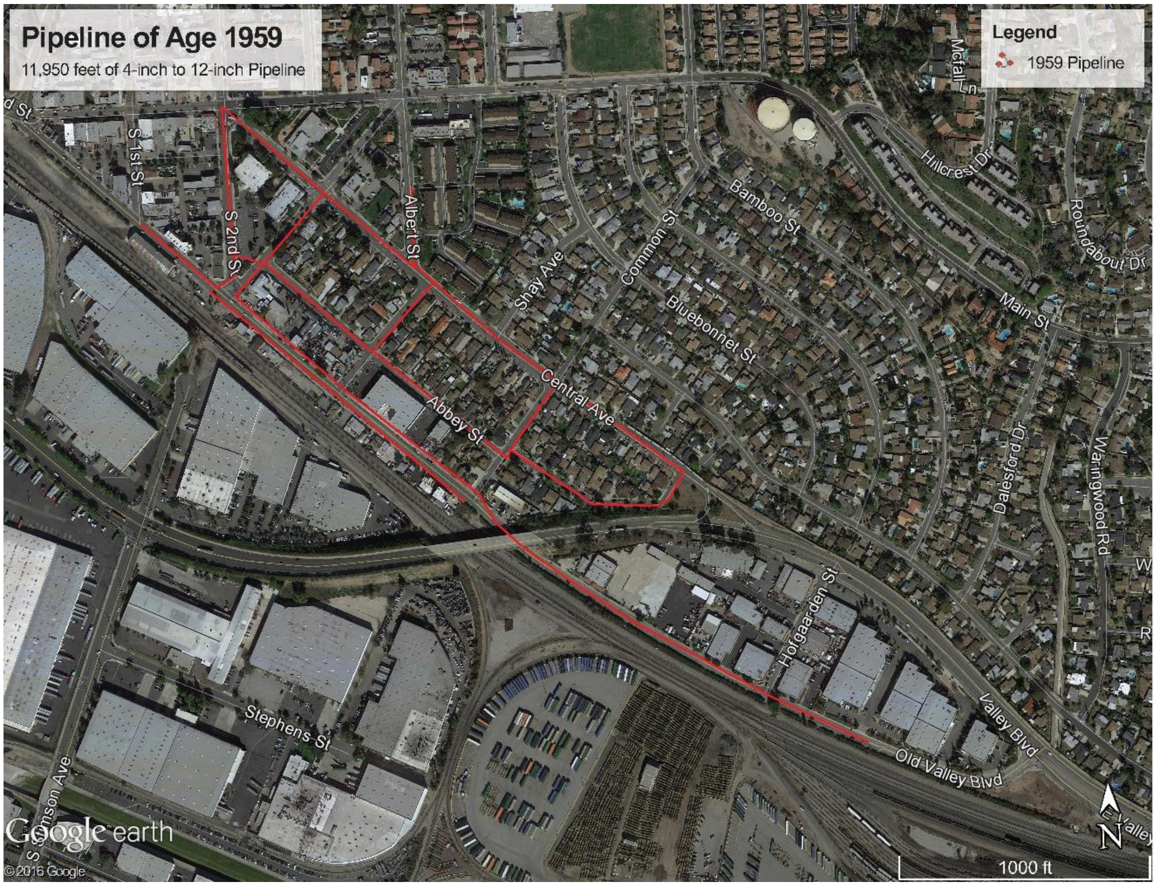
Table 9-17 – Near Term Pipeline Replacement Schedule

Year	Feet of Pipe per Year
2016	0
2017	380
2018	760
2019	1,140
2020	1,520
2021	1,900
2022	2,280
2023	2,660
2024	3,040
2025	3,420
Total for Ten years	17,100

According to records, LPVCWD distribution system's oldest pipe age is 1948. At the estimated year of 2034 when the system would reach maturity, the age of pipelines younger than 1959 would reach its service life and need to be replaced.

By creating queries within the computer model and running simulations, it was determined that approximately over 13,000 feet of pipeline of the age of 1959 or earlier exist in the system. These pipelines are located in LPVCWD's Pressure Zone 1 and Pressure Zone 2. **Figure 9-17** shows the pipelines of age 1959 located in Pressure Zone 1.

Figure 9-17 – Pipelines of the Age of 1959 (CIP#8)



There is approximately 11,950 feet in Pressure Zone 1 of pipelines of the age of 1959 ranging from 4-inch to 12-inch that would need to be replaced by the year 2034. As shown, the pipelines that would need replacement are enclosed by Old Valley Blvd on the south, Central Ave on the north, 1st Street on the west and Abbey Street on the east.

9.7.4 Pump Maintenance based on Age

There are 3 existing Well pumps and 14 existing booster pumps for a total of 17 pumps. In a 30-year cycle, a pump should be overhauled once and replaced once.

Therefore, over a typical 10-year period, there should be an allocation for 6 pump overhauls and 6 pump replacement.

$$\left(\frac{17\ pumps}{30\ year\ cycle}\right)(10\ years) \cong 6\ pumps\ per\ 10\ year\ period$$

9.7.5 Pump Maintenance based on Condition

Based on SCE pump efficiency testing, all pumps below the 65% efficiency rating threshold should be considered for overhaul or replacement. **Table 9-18** lists the current ratings of the pumps which are candidates for repair of replacement.

Table 9-18 – Pumps According to Efficiency Rating

Pump Name	Eff. (%)
LP Treatment Plant No. 1	43.1
LP Treatment Plant No. 2	45.6
Well No. 3	53.1
Pressure Zone 2 No. 1	55.5
Hudson No. 2	59.3
Well No. 5	60.4

There are no SCE pump efficiency testing results for 6 out of 17 pumps in the LPVCWD system. According to the table above, there are 6 pumps that require an overhaul. Well No. 5 replacement is considered as a capital improvement per CIP #10. The Hudson booster pump No. 2 is proposed to be replaced per CIP#11 as described in Section 9.8. The remaining 4 pumps listed above require efficiency overhauls and 5 existing pumps currently exhibit efficiencies meeting the design criteria. The remaining 6 pumps that have not been tested are new pumps having been installed within the last 5 years. It is not anticipated that these new pumps will require replacement or refurbishment in the next 10 years. In light of this, it is expected that 4 pumps will require replacement and 5 pumps will require refurbishment over the next 10-year cycle.

9.7.6 Control Valve Overhaul Based on Age

Control Valves should be scheduled for overhaul on a 25-year cycle. There are 4 existing control valves, as shown in **Table 9-19**.

$$\left(\frac{4\ controal\ valves}{25\ year\ cycle}\right)(10\ years) \cong 2\ control\ valves\ per\ 10\ year\ period$$

Table 9-19 – Active Control Valves

No.	Location	Size (inches)
1	Zone 4	6
2	Zone 2	8
3	Zone 5	4
4	Zone 2	10

9.7.7 Tank Recoating's Based on Age

When exposed to the environment, steel oxidizes and deteriorates. For steel water tanks, paints and other protective coatings are used on both the interior and exterior to prevent such deterioration. LPVCWD has a 20-year interval period for tank recoating(s), however if there is an indication of severe corrosion or an immediate recommendation for re-coating on a wet inspection report, the tank will be re-coated as needed. Both the interior and exterior coatings must be carefully selected to provide the best protection based on coating life and effectiveness of protection.

LPVCWD considers the following factors when selecting an exterior coating:

- The type of atmosphere in which the tank is located
- The area surrounding the tank
- The expected ambient temperatures and prevailing winds during the time of year when
- the coating project is scheduled to be performed
- Appearance of the coating
- AWWA Standard D-102 Coating Steel Water Storage Tanks
- ANSI/NSF Standard 61

Interior tank coatings must be able to withstand the following:

- Constant immersion in water
- Varying water temperatures
- Alternate wetting and drying periods
- High humidity and heat in the zones above the high-water level
- Chlorine and mineral content of the water

In addition, the interior coatings must not impose a health risk on the general public and must be approved for potable water storage by the CA SWRCB.

$$\left(\frac{3\ tanks}{20\ year\ cycle}\right)(10\ years) \cong 2\ tank\ recoatings\ per\ 10\ year\ period$$

9.7.8 Tank Replacement Based on Age

On an 80-year replacement cycle, none of the three LPVCWD tanks is scheduled for replacement within the next ten years.

9.7.9 Well Refurbishment or Replacement Based on Age

On a 50-year refurbishment/replacement cycle, two LPVCWD Wells (Well No. 3 and 5) exceed or will exceed their recommended life cycle during the next ten years in terms of age. Well No. 2 will be 50 years in 2027 and will need to be refurbished or replaced at that time.

9.8 Capital Improvement Program

The Capital Improvement Program (CIP) is a set of projects recommended to be implemented within the next ten years. Individual projects are given relative priority based on perceived urgency. Projects have been separated as Capital Projects and Maintenance Projects to be consistent with LPVCWD's budgeting allocations.

9.8.1 Cost Assumptions

Estimates for capital project are based on the cost assumptions provided in **Table 9-20**.

Table 9-20 – Unit Cost Assumptions

Category	Item	Unit Cost	Unit
Storage	New Storage	2	$/gallon
	Recoating	15	$/sf
Pumps	New Pump	150,000	$/pump
	Pump Replacement	75,000	$/pump
	Pump Refurbishment	15,000	$/pump
Control Valves	New Valve	50,000	$/valve
	Valve Overhaul	15,000	$/valve
Distribution	New Pipes	17.5	$/in/ft

The total cost of a capital project is the summation of the unit costs plus costs associated with design and administration. These costs are 25% of construction costs for engineering and administration and 10% of construction costs for contingencies.

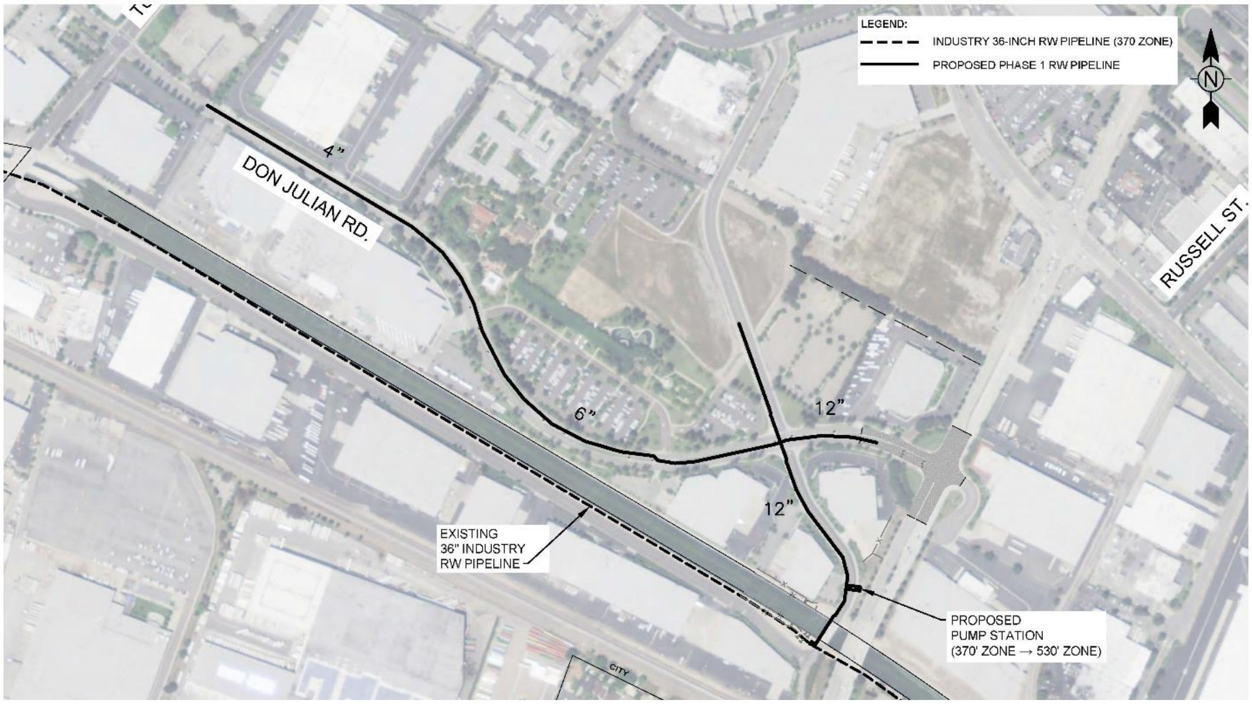
9.8.2 Capital Projects

The capital projects listed in this section consider a 10-year planning horizon. Relative priority for individual projects or groups of projects is provided. Prioritization is not meant to be rigid, rather to assist with scheduling and implementation. It is recommended to corroborate conditions in the field with operations prior to implementation.

9.8.2.1 Phase 1 Recycled Water System (CIP#10)

As previously mentioned, the Districts Recycled Water Project design utilizes the City of Industry's 36-inch recycled water transmission line as the source of supply for the system. The District has partnered with Upper San Gabriel Valley Municipal Water District to secure a $428,000 grant from the State Department of Water Resources for Phase 1 of the Recycled Water System Project. This grant will cover approximately 25 percent of the estimated cost of Phase 1, which is expected to serve 50 acre feet of recycled water per year to irrigation customers on Don Julian Avenue as shown in **Figure 9-18.**

Figure 9-18 – Phase 1 Recycled Water Project (CIP# 9)



9.8.2.2 Well 5 Rehab and Sound Structure Improvement (CIP#10)

The District has identified that Well 5's efficiency is nearly at 60% and will required rehab. During these activities, it would be much more feasible and cost effective to install a sound attenuating structure to properly address noise complaints.

9.8.2.3 Hudson Avenue Pumping Improvements (CIP#11)

Given the current layout of the Hudson Booster Station, the District plans to Replace/Rehab pumps, install VFDs and upgrade discharge piping for increased efficiency purposes. The improvement would consist of maintaining 2 pumps with each having a maximum pumping rate of 1,500 gpm, but with Best Efficiency Pumping rates at 1,000 gpm. The envisioned range of pumping would be 700 to 1,500 for these two pumps.

The third pump is envisioned to range from 600 to 1,000 gpm. In addition, the installation of mag meter at the plant effluent and testing taps would also be included in the improvement to ensure proper efficiency testing of each pump.

9.8.2.4 923 and 892 N Hacienda Blvd Commercial Flow Deficiencies (CIP #12)

As stated before, due to the location of these deficiencies and the cost to implement a pipeline replacement solution, the proposed improvement would include an administrative and capital solution that consist of constructing a Fire Hydrant service from the existing SWS 12" water main on the opposite side of Hacienda to be located in front of the subject commercial use. In this manner, sufficient fire flow will be provided through use of grouping one of LPVCWD's existing fire hydrants with a new SWS hydrant to achieve the fire flow requirements

9.8.2.5 Estimated Capital Project Cost's

Based on the Capital Project's identified in this section, **Table 9-21** summarized the estimated cost for each project.

Table 9-21 – Capital Projects ($1,000s)

CIP #	Category	Project	Priority	Justification	Size (in)	Length (ft)	Constr.	Engr. & Admin. (25%)	Cont. (10%)	Total
1	Fire Flow	5th Street Waterline Improvements	High	Fire flow deficiency (School)	8	510	87	22	9	**118**
2	Fire Flow	Valve and Pipeline Improvements in Rorimer and Ferrero	Medium	Fire flow deficiency (Residential)	6	605	150	37	15	**202**
3	Fire Flow	Valve and Pipeline Improvements in Bamboo St. and Dalesford Dr.	Medium	Fire flow deficiency (Residential)	8	335	182	46	19	**247**
4	Fire Flow	Pipeline Improvements in Inyo and Common and Fire Hydrants	Medium	Fire flow deficiency (Residential)	8	1,570	243	61	25	**329**
5	Fire Flow	Pipeline Improvements in Hacienda	Medium	Fire flow deficiency (Residential)	8	550	88	22	9	**119**
6	Fire Flow	Pipeline Improvements in Bamboo St.	Medium	Fire flow deficiency (Residential	8	1,750	271	68	27	**366**
7	Condition	Service Line Replacement	Medium	Recurring Leaks	2	250	15	-	1	**16**
8	Condition	Old Valley Blvd General Waterline Replacements	Low	Replace aging waterline	8	10,450	1,463	366	147	**1,976**

CIP #	Category	Project	Priority	Justification	Size (in)	Length (ft)	Constr.	Engr. & Admin. (25%)	Cont. (10%)	Total
9	Improvement	Phase 1 Recycled Water System	Medium	Reduce dependence of imported water supply			1600	400	200	**2200**
10	Supply	Well 5 Rehab and Sound Structure Improvement	Medium	Sound and Efficiency Issues			100	25	10	**135**
11	Booster Station	Hudson Avenue Pumping Improvements	Medium	Efficiency and Layout Improvements			600	150	60	**810**
12	Fire Flow	Collaborate with SWS for installation of a Fire Hydrant on Hacienda	Medium	Fire flow deficiency (Commercial)			10	3	1	**14**
Total										**6,532**

9.8.3 Maintenance Projects

The projects identified in this section consider field observations noted during field operations along with cyclical maintenance projects on a 10-year planning horizon. Relative priority for individual projects or groups of projects is provided. Prioritization is not meant to be rigid, rather to assist with scheduling and implementation. It is recommended to corroborate conditions in the field with operations prior to implementation.

9.8.3.1 Aging Galvanized Pipe and Polyethylene Pipe (PEP) Service Line Replacements

The District identified that aging galvanized and polyethylene pipe service lines pose problems with service leaks. As a result, the District created an ongoing program to replaced galvanized and polyethylene service lines with copper service lines. The District' program consist of replacing the service lines that meet this criterion when leaks are discovered on any part of the service line. In review of the District's 5-year leak repair history, almost all service line leaks are from 1" PEP or galvanized pipe with very few from copper pipe. In some cases, it was also identified that the service saddle was of cast iron material that showed heavy signs of corrosion. As a result, these identified saddles were also replaced when the service lines were replaced. Over the last 5 years the District Field Crews have replaced 109 service lines. This program shall continue over the next five-year period at a pace of approximately 20 service line replacements a year.

9.8.3.2 Aging Cast Iron Service Saddle Replacements

The District has experienced a few leaks on Leverett Avenue and Dora Guzman Avenue that caused substantial damage to the public street and required emergency shut-downs that resulted in customers being without water for several hours. Based on the data gathered during service line leak repairs on these streets, staff identified that all services were installed using cast-iron saddles on Leverett Avenue and Dora Guzman Avenue. Given the high probability of leaks on these types of saddles due to corrosion, the District plans to replace the remaining cast iron service saddles on Leverett Avenue and Dora Guzman Avenue with bronze double strapped saddles. It is estimated that there are approximately 20 cast iron service saddles that will require replacement.

9.8.3.3 Valve Replacements

During valve maintenance activities, District staff notes valves that pose difficulty in operating or being non-operative at all. The average rate of replacement should be roughly 10 valves per year, primarily in areas where pipeline replacements are at least 5 years or more into the future.

9.8.3.4 Tank Recoating's

As stated in section 9.6.4, paints and other protective coatings are used on both the interior and exterior of steel tanks to prevent such deterioration. Based on the District's tank cyclical maintenance, the 3.0 MG and 1.8 MG tanks on Main St. will need to be recoated.

9.8.3.5 Estimated Maintenance Project Cost

Based on the Maintenance Projects identified in this section, **Table 9-22** summarized the estimated cost for each project over the upcoming 10-year period.

Table 9-22 – 10 Year Maintenance Projects ($1,000s)

Category	Project	Priority	Justification	Constr.	Engr.	Cont. (10%)	Total
Boosters	4 Pump Overhauls	Medium	Booster Cyclical Maintenance	60	0	6	**66**
	5 Pump Replacements	Medium	Booster Cyclical Maintenance	375	0	38	**413**
Control Valves	2 Control Valve Overhauls	Medium	Valve Cyclical Maintenance	30	0	3	**33**
System Valves	100 System Valve Replacements	Medium	Valve Cyclical Replacement	1000	0	100	**1100**
Service Laterals and Saddles	101 Service Lateral Replacements	Medium	Valve Cyclical Replacement	250		25	**275**
Storage	Main Street Tank Recoating's	Medium	Tank Cyclical Maintenance	720	180	72	**972**
Total							**2859**

APPENDIX A

Water Master Judgement

APPENDIX B

Title 22 Code of Regulations

APPENDIX C

LPVCWD 2015 Consumer Confidence Report

APPENDIX D

Raw Fire Flow Data

APPENDIX E

Fire Code, Regulation 8

APPENDIX F

Deficiency Improvements

APPENDIX G

PVOU Water Supply

Memo

To: Honorable Board of Directors

From: Greg Galindo, General Manager

Date: May 12, 2017

Re: Authorize Investment of $150,000 of District Reserve Funds

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Summary

As declared in the District's Investment Policy, the Board has the authority to invest monies not required for the immediate necessities of the local agency. In accordance with the District's Investment Policy, the Board of Directors authorized the investment of $500,000 in various investments with Raymond James & Associates Inc. in January 2016 and authorized a reinvestment of $150,000 in November 2016. Below is a summary that provides specifics of the certificates of deposit (CD) that the District currently holds.

Current

CD	Coupon	Acquisition Cost	CD Original Duration	Maturity Date	Estimated Annual Income	Remaining Months
Investors Svgs BK	0.85%	$ 150,000	15	5/25/2017	$ 744.04	7.00
Santander BK	1.00%	$ 50,000	18	8/10/2017	$ 397.26	9.53
Sallie Mae BK	1.15%	$ 50,000	24	2/12/2018	$ 575.00	15.65
Discover BK	1.25%	$ 150,000	18	6/14/2018	$ 1,875.00	13.08
Ally BK	1.25%	$ 50,000	30	8/13/2018	$ 625.00	21.63
Goldman Sachs BK	1.45%	$ 50,000	36	2/11/2019	$ 725.00	27.62
Average	1.16%	$ 500,000	24		$ 4,941.30	15.75
Weighted	**1.12%**		**21**			**13.47**

As shown there is one CD in the amount of $150,000 that is maturing on May 25, 2017, allowing the District to purchase another CD that is consistent with the District's Investment Policy and investment strategy.

Staff requested and received an Offer Sheet for a $150,000 CD from Dewane Investment Strategies that is enclosed for your review. The CD is insured by the Federal Deposit Insurance Corporation (FDIC) and is considered "Excellent" or "Superior" as evaluated by IDC, Financial Publishing (http://www.idcfp.com/risk-measurement). Provided below is a summary of the CDs including the proposed CD, in an effort to compare the current to proposed District's portfolio.

Proposed

CD	Coupon	Acquisition Cost	CD Original Duration	Maturity Date	Estimated Annual Income	Remaining Months
Santander BK	1.00%	$ 50,000	18	8/10/2017	$ 123.29	2.96
Sallie Mae BK	1.15%	$ 50,000	24	2/12/2018	$ 575.00	9.07
Discover BK	1.25%	$ 150,000	18	6/14/2018	$ 1,875.00	13.08
Ally BK	1.25%	$ 50,000	30	8/13/2018	$ 625.00	15.06
BMW North Amer BK	1.45%	$ 150,000	18	11/19/2018	$ 2,175.00	18.28
Goldman Sachs BK	1.45%	$ 50,000	36	2/11/2019	$ 725.00	21.04
Average	1.26%	$ 500,000	24		$ 6,098.29	13.25
Weighted	**1.30%**		**22**			**14.22**

At the upcoming meeting staff, will provide more information regarding the recommended investment and the current state of the District's overall cash and investments. I look forward to the discussion on this item.

Recommendation

Staff recommends the Board approve investment that will be consistent with the Offer Sheet prepared by Dewane Investment Strategies, dated May 12, 2017.

Enclosure

1. Offer Sheet of Investments through Raymond James & Associates, Inc., prepared by Shawn Dewane, Investment Management Consultant, dated May 12, 2017.

Offer Sheet

Friday, May 12, 2017

RAYMOND JAMES

Shawn Dewane
Investment Management Consultant
2429 West Coast Highway
Ste 207
Newport Beach, CA 92663
949-631-7200, 888-880-RJFS Ext. 1
949-631-7272 FAX, Shawn.Dewane@RaymondJames.com

YIELDS REPRESENT YIELD TO MATURITY OR YIELD TO WORST CALL AS INDICATED. PLEASE REVIEW THIS INFORMATION CAREFULLY WITH YOUR FINANCIAL ADVISOR TO ASSURE IT MEETS YOUR INVESTMENT OBJECTIVES.

Qty	Cusip	Moody/S&P/Fitch (Watch) FDIC#	Underlying Rating	Issue	Coupon	Maturity	Modified Duration	Price	Yield to Worst (TEY)	Yield to Maturity	Accrued Interest	Principal	Net Amount
150	05580AJF2	35141		Bmw Bk North Amer Salt Lake City Utah Conditional Puts - Death of holder - Restricted States: OH	1.450%	11/19/2018	1.48	$100.000	1.450% (1.450%)	1.450%	$0.00	$150,000.00	$150,000.00
				Weighted Averages and Totals	**1.450%**	**1.52**	**1.48**	**$100.000**	**1.450% (1.450%)**	**1.450%**	**$0.00**	**$150,000.00**	**$150,000.00**
					Avg Coupon	**Avg Years to Maturity**	**Avg Modified Duration**	**Avg Price**	**Avg Yield to Worst (TEY)**	**Avg Yield to Maturity**	**Total Accrued Interest**	**Total Principal**	**Total Investment**

(n) Floating/Variable Rate (c) Yield to Call (p) Yield to Par Call (w) Yield to Middle Call (u) Yield to Put (dis) Discount Yield (r) Pre-Refund (t) Mandatory Put (f) Called in Full (TEY) Taxable Equivalent Yield

Offer Sheet

Friday, May 12, 2017

RAYMOND JAMES

Shawn Dewane
Investment Management Consultant
2429 West Coast Highway
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949-631-7272 FAX, Shawn.Dewane@RaymondJames.com

YIELDS REPRESENT YIELD TO MATURITY OR YIELD TO WORST CALL AS INDICATED. PLEASE REVIEW THIS INFORMATION CAREFULLY WITH YOUR FINANCIAL ADVISOR TO ASSURE IT MEETS YOUR INVESTMENT OBJECTIVES.

Minimum purchases may apply. Prices and yields are subject to change based upon market conditions and availability.

An overview of these investments, their features and risks is available at raymondjames.com, "Smart Bond Investing" at finra.org , under "Learn More" at investinginbonds.com, or emma.msrb.org.

RISK CONSIDERATIONS: These securities are subject to risk factors that may decrease (or increase) the market value of your investment. Interest or dividend rate risk is the risk that changes in interest rates may reduce (or increase) the market value of your investment. Generally, a rise in interest rates decreases market price; while a fall in interest rates increases market price. Default or credit risk is the risk that the issuer, obligor, or insurer will be unable to make interest payments or repay principal when due. Liquidity risk is the risk that you will be unable to sell these securities in the secondary market. If you decide to sell prior to maturity, your proceeds may be more or less than the original cost, and may be subject to capital gains or loss.

CREDIT RISK OR DEFAULT RISK refers to the risks that the issuer's creditworthiness may weaken or possibly the issuer will not be able to pay interest or repay principal. Adverse changes in the creditworthiness and rating may decrease value of the investment. Generally, higher yields and/or lower ratings reflect higher perceived credit risk. Independent rating agencies provide actual and underlying security ratings on most securities which at times include future outlook and/or placement of the security under review for future action. These ratings are subject to change at any time and are not meant as a recommendation to buy, sell or hold. Securities with the same rating can actually trade at significantly different prices. Raymond James trade confirmations, online accounts and monthly statements display only the current ratings and subsequent changes of those Rating Agencies to which Raymond James subscribes. Investors may request Moody's and/or S&P credit reports from their financial advisors, and Fitch reports are available for municipal bonds. To learn more please refer to moodys.com, standardandpoors.com, and fitchratings.com
Insurance, if specified, relates to the timely payment of principal and interest. Insurance does not guarantee market value or protect against fluctuations in bond prices resulting from general market fluctuations. No representation is made as to the insurer's ability to meet its financial commitments and the underlying credit should be considered. High yield bonds are not suitable for all investors and are generally considered speculative in nature with greater potential loss of interest and/or principal. Brokered Certificate of Deposit FDIC insurance covers up to $250,000 (including principal and interest) for deposits held in different ownership categories, including single accounts, joint accounts, trust accounts, IRAs, and certain other retirement accounts, per issuer. Funds may not be withdrawn until the maturity date or redemption date. However, these CDs are negotiable, which means, that although not obligated to do so, Raymond James and other broker/dealers currently maintain an active secondary market at current interest rates. FDIC insurance does not guarantee market value or protect against fluctuations in CD prices resulting from general market changes.
INCOME: In general, fixed income investments pay a fixed interest rate coupon. Some bonds, however can pay variable payments such as step coupons and or variable rates based on a predetermined formula. Interest from taxable zero coupon securities is subject to annual taxation as ordinary income, even though no income is received. Certain federally tax-exempt municipal securities, although federally tax-exempt, may be subject to federal alternative minimum tax (AMT). Brokered CDs annual percentage yields (APY) represents the interest earned based on simple interest calculations

MATURITY: Brokered CDs with a maturity of longer than 1 yr are considered as Long-Term. Certain early redemption features, such as a call at issuer's option, provide the issuer an option to repay principal prior to maturity and may change the term of the investment. Certain brokered CDs are also callable at the option of the issuer. Modified Duration and Convexity are measures of price sensitivity of a fixed-income security to changes in interest rates. Modified Duration is the approximate percentage change in price that would occur with a 1% change in interest rates. Convexity estimates the impact of interest rate changes on modified duration. Modified Duration and Convexity may be used together to approximate price volatility of fixed-income securities. Modified Duration does not account for early redemption features, such as calls by the issuer. Mortgage-backed securities and Collateralized Mortgage Obligations (CMOs) are priced based on average life which includes prepayment assumptions that may or may not be met and changes in prepayments may significantly affect yield and average life.

For more complete information about new issues, including charges and expenses, obtain a prospectus at sec.gov or municipal official statement at emma.msrb.org or from your Financial Advisor. Please read it carefully before you invest or send money.

The information in this report has been obtained from sources considered to be reliable, but we do not guarantee that the foregoing material is accurate or complete. This firm may have a long or short position in the securities presented in this report and may buy or sell such securities in the course of our regular business.

Investors are urged to consult with their own tax advisors with regard to their specific situation prior to making any investment decisions with tax consequences.

Memo

To: Honorable Board of Directors

From: Rosa Ruehlman, Board Secretary RBR

Date: 05/08/17

Re: Sponsorship for American Cancer Society's Relay for Life

The District recently received a request for sponsorship from the American Cancer Society's Relay for Life. This event is being held on Saturday and Sunday June 3-4, 2017 at the La Puente Park. They are asking for sponsorship of this event. (See attachment)

Since 2011, the Board approved a donation of $200 to purchase water that will be needed for the event. Also in the last three years, Staff has provided our District's Banner to be displayed at the event.

The District's Resolution 184 establishes a policy for sponsorship of community activities and recognized the value and need for District sponsorship of community activities which are consistent with the mission of the District. In short, the policy states that participation in education and water conservation activities within its service area is for a public purpose and provides both direct and indirect benefits to the District.

If the Board so chooses to provide sponsorship for this event, the donation will be recorded as an expense to the District's 2017 Budget (Account # 5574 - Public Outreach/Community Events and Services).

I hope you find this information useful. If you have any questions, please feel free to contact me.

AMERICAN CANCER SOCIETY RELAY FOR LIFE

Celebrate. Remember. Fight Back.

La Puente Valley County Water District
112 N. First Street
La Puente, CA. 91744
626.330.2126

May 3, 2017

Dear Rosa:

The La Puente community and the American Cancer Society is preparing for the 13th Annual ***Relay for Life of La Puente/Hacienda Heights*** to be held at La Puente Park on June 3-4, 2017. Funds raised by this event will be used to provide services for local cancer patients, community education, programs and national research projects as we fight to defeat this dreaded disease.
Relay for Life includes a 24-hour run/walk event, as well as entertainment, local bands, food, kids corner, and many other activities. In the evening, a special and emotional ceremony known as "Luminaria" will recognize **local cancer survivors and honor those who have lost their battle from cancer.**

At this time we are asking local businesses and community organizations to team up with the American Cancer Society by sponsoring our **Survivors** ***on Team Liz with a Smile***. Opportunities for involvement and name recognition are available for in-kind donations, i.e. (food, beverages, water, snacks, paper products, etc.) or gift certificates for the raffle are also available.
As a non-profit organization (501©3) all donations are tax deductible (ACS TaxID# 13-1788491).

We thank you for consideration and look forward to having you join the fight against cancer.

Sincerely,

Sylvia Ynzunza
Committee Member
626.435.6103

Memo

To: Honorable Board of Directors

From: Roy Frausto, Compliance Officer/Project Engineer

Date: May 15, 2017

Re: Project Engineer's Report – April 2017

CAPITAL PROJECTS

1. LPVCWD and CIWS Water Master Plan Update – District staff has collaboratively worked with Civiltec to finalize the master plans. Staff will recommend the adoption of the Final Water Master Plan during the May 15, 2017 regular Board Meeting. In addition, staff has submitted a draft final copy of the CIWS WMP to the City of Industry and has scheduled a meeting with City of Industry staff to review/discuss the WMP.

2. LPVCWD Recycled Water Project – Staff will continue to finalize the Phase 1 plans and specifications.

3. LPVCWD PVOU Intermediate Zone Project – Upon DDW request, EPA, Northrop Grumman, and LPVCWD staff met via conference call to discuss the possible interaction between the Shallow Zone and Intermediate Zone in the PVOU on April 20, 2017. In addition, staff continuous to participate on the monthly engineering design meetings.

DEVELOPMENTS

1. LPVCWD 747 Del Valle Development – Staff has been actively corresponding with the developers engineering team to review/comment on the onsite design process of water services. In regards to the offsite watermain extension improvement, Civiltec submitted 90% design drawings to the City of La Puente for review and comment. In addition, staff submitted a draft copy of the Watermain Extension agreement to the developer.

2. Star Theatre Property – Staff received inquiries regarding water services supplying this property. Based on preliminary conceptual design conversations, the property may be used to develop 22 units of condos. Currently, a fence has been put in place at the property to serve as a future construction barrier.

SPECIAL/OTHER PROJECTS

1. LPVCWD Air Stripper Efficiency Evaluation – Trussell Technologies provided a revised Tech Memo and Test Protocol on February 2, 2017. The finalized revised Tech Memo and Test Protocol were submitted to DDW on February 24, 2017 and DDW provided comments on May 8, 2017. Trussell and staff will work collaboratively to provide responses to DDW's questions.

2. LPVCWD Caustic Reduction Plan – Trussell Technologies has finished reviewing data for the first phase of the test protocol. Staff will regroup and discuss with Trussell to determine the next steps for phase 2 of the test protocol.

3. Main St. Property Retrofit –Staff is currently researching prospective design/build firms that have extensive experience with retrofitting commercial buildings.

4. Banbridge Pump Station –Staff met with Mr. Samuel B. Villalobos and Mr. Javier Leivanos on March 27, 2017, to discuss the District's scope of work for the project. Given their input, staff is considering changes to the project scope originally envisioned.

FUTURE PROJECTS

1. Water System Connection Fees – Update the current policy on water system connection fees.

2. Lead Sampling for Schools – Coordinate and create a sample schedule for school lead testing for all schools within the LPVCWD and CIWS service area.

3. Water Loss Accountability – Analyze and draft an annual report to optimize water accountability and minimize water loss.

4. Recycled Water Rules and Regulations – Draft and propose a policy for the use of Recycled Water.

5. Recycled Water Phase 1 Retrofits – Coordinate with Phase 1 customers to start design of onsite retrofits.

6. AMI Transition – Plan and execute deliverables required to transition from AMR to AMI.

7. On Call Contractor Specification - Create a Specification for an On-call contractor with a 24-month agreement with an option to extend.

8. GIS System – Staff coordinated with DCSE to manage the GIS system in-house by reflecting all updates and changes on a real-time basis. Staff will schedule accordingly to start reflecting redline field data.

Memo

To: Honorable Board of Directors

From: Greg B. Galindo, General Manager

Date: May 12, 2017

Re: General Manager's Report – April 2017

ADMINISTRATIVE

1. BPOU Agreement – Negotiations are now complete and the 2017 BPOU Agreement has been executed and is in effect. The 2017 BPOU Agreement extends the groundwater treatment cost reimbursement through May 2027.
2. PVOU IZ Agreements – Negotiations continue with Northrop and potential recipients of water from the proposed treatment. When these negotiations are complete updated drafts of the definitive agreements to operate the proposed PVOU IZ treatment facility and deliver treated water will be provided to the Board.
3. Emergency Response Plan – Staff is still in the process of updating this plan and will conduct a table top exercise with Staff when completed and will provide the Board information on the plan at an upcoming Board meeting. This task has been put on hold until a decision is made on the District's involvement with PWAG and its proposed Emergency Preparedness Coordinator position.
4. Del Valle Project Waterline Extension Agreement –District Counsel has provided a draft development agreement for the proposed development at 747 Del Valle. Staff is waiting for a response on the draft agreement.
5. Water Rate Study RFP – Staff has begun to draft a request for proposal for a water rate study. This RFP should be ready to be sent out in May.
6. Summer 2017 Newsletter – Staff has initiated work on the Summer 2017 Newsletter. CV Strategies will be assisting staff with this effort. A draft of the Newsletter will be provided at the next Board meeting.
7. 2016 Consumer Confidence Report – Staff has begun work on the 2016 CCR, which is required to be published before July of this year. CV Strategies will be assisting staff in this effort.
8. Main Office Computer Server – The new Main Office computer server was purchased in April and installed on May 11th and 12th.

CUSTOMER SERVICE

1. District's UHET Program – No applications were received to date for the UHET Program in April 2017. Since the program's inception, there have been a total of 302 UHET distributed to District Customers.
2. Conservation Regulations – For April 2017, one (1) violation notices were issued to District Customers for violating water conservation regulation and none were issued to CIWS Customers.

SUPPLY, TREATMENT & COMPLIANCE

1. In the month of April, the District's Well Field produced a total of 290.86 AF and delivered 169.19 AF to Suburban Water Systems, 1.36 AF to CIWS and received .73 AF from CIWS. The District's total system demand for the month of April was 121.67 AF. The Production Report for calendar year 2017 for both LPVCWD and CIWS is enclosed.
2. 2017 Water Conservation – A summary water system usage for the month of February 2017 as compared to the same time period in 2013 is shown below. The reduction in use for this time period is 27.47%.

Month	2013	2017	Difference 2017-2013 (%)	Accumulative Difference (%)
January	115.58	85.55	-26.0%	-26.0%
February	112.08	67.48	-39.8%	-32.8%
March	135.08	99.89	-26.0%	-30.3%
April	153.73	121.67	-20.9%	-27.5%
Totals	516.47	374.60	-141.87	-27.47%
Production data shown in acre feet (AF)				

3. MSGB Groundwater Levels – On April 21, 2017, the Baldwin Park key well level was 182.8 feet asl.
4. Annual Report to the Division of Drinking Water – In April Staff completed and electronically submitted the annual reports to the Division of Drinking Water for the District and the CIWS. A copy of these reports is available upon request.

HUMAN RESOURCES

1. Five field tailgate safety meetings and one office staff safety training were completed in the month of April.
2. Meetings/Events Attended in April 2017
   - April 7th – PWAG Emergency Response Ad hoc meeting.
   - April 12th – Watermaster Basin Management Committee meeting
   - April 13th – BPOU Committee meeting
   - April 15th – Watermaster's Administrative Committee meeting
   - April 15th – SGVWA Legislative and Communication Committee meetings
   - April 18th – BPOU meeting regarding new agreement transition
   - April 19th – CUEMA Board meeting
   - April 20th – IPUC meeting
   - April 24th – SGVWA Board meeting
   - April 27rd – SCWUA meeting
   - April 25th – Puente Basin Watermaster meeting

ITEMS IN PROGRESS

1. Update of all safety policies.
2. Draft of policy regarding membership to associations
3. Update District Website on Transparency
4. Update of Record Retention Policy
5. Update of Return to Work Policy

Enclosures

1. 2017 LPVCWD/CIWS Production Report

La Puente Valley County Water District

PRODUCTION REPORT - MARCH 2017

LPVCWD PRODUCTION	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2017 YTD	2016
Well No. 2	5.04	5.20	4.63	4.64									**19.50**	**83.48**
Well No. 3	6.02	6.39	5.75	5.52									**23.69**	**97.68**
Well No. 5	292.09	249.87	294.34	279.97									**1116.27**	**3311.35**
Interconnections to LPVCWD	12.33	2.12	2.48	0.73									**17.66**	**92.57**
Subtotal	**315.48**	**263.58**	**307.20**	**290.86**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1177.12**	**3585.07**
Interconnections to SWS	228.61	192.37	199.71	167.83									**788.52**	**2121.26**
Interconnections to COI	1.31	3.73	7.60	1.36									**14.00**	**59.20**
Interconnections to Others	0.00	0.00	0.00	0.00									**0.00**	**0.00**
Subtotal	**229.92**	**196.10**	**207.31**	**169.19**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**802.52**	**2180.46**
Total Production for LPVCWD	**85.55**	**67.48**	**99.89**	**121.67**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**374.60**	**1404.61**
CIWS PRODUCTION														
COI Well No. 5 To SGVCW B5	141.77	140.36	148.65	141.95									**572.73**	**1647.30**
Interconnections to CIWS														
SGVWC Salt Lake Ave	0.62	0.53	0.69	0.82									**2.66**	**8.66**
SGVWC Lomitas Ave	84.10	66.19	83.11	105.86									**339.26**	**1295.72**
SGVWC Workman Mill Rd	0.19	0.15	0.13	0.02									**0.49**	**3.71**
Interconnections from LPVCWD	1.31	3.73	7.60	1.36									**14.00**	**59.20**
Subtotal	**86.22**	**70.60**	**91.53**	**108.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**356.41**	**1367.29**
Interconnections to LPVCWD	12.33	2.12	2.48	0.73									**17.66**	**88.58**
Total Production for CIWS	**73.89**	**68.48**	**89.05**	**107.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**338.75**	**1278.71**

Upcoming Events

To: Honorable Board of Directors

From: Rosa Ruehlman, Office Administrator *RBR*

Date: 05/15/17

Re: Upcoming Board Approved Events for 2017

Day/Date	Event	Aguirre	Escalera	Hastings	Hernandez	Rojas
Tuesday, May 16, 2017	Water 101 at Upper District in Monrovia from 8:30 to 11:00 am.		X			X
Wednesday, May 17, 2017	San Gabriel Valley Water Association Luncheon at the South Hills Country Club in West Covina. **(CONFIRMED)**	X	X	X		X
Thursday, May 25, 2017	SCWUA Luncheon at the Pomona Fairplex					
Thursday, June 22, 2017*	SCWUA Field Trip - San Gabriel Valley Water Supply **(Sold Out)**		X			
Thursday, July 27, 2017*	SCWUA Luncheon at the Pomona Fairplex					
Wednesday, August 9, 2017*	San Gabriel Valley Water Association Luncheon –location TBD **(Tentative)**					
Monday-Thursday, September 25-28, 2017	CSDA 2017 Annual Conference in Monterey Marriott/Portola Hotels in Monterey, CA					
Thursday, September 28, 2017*	SCWUA Luncheon at the Pomona Fairplex					
Wednesday-Friday, October 4-6, 2017	SmartWater Innovations Conference at South Point Hotel in Las Vegas, NV					
Monday–Thursday, October 23-26, 2017	AWWA CA/NV 2017 Spring Conference at Atlantis Casino Resort in Reno, NV					

Thursday, October 26, 2017*	SCWUA Luncheon at the Pomona Fairplex					
Wednesday, November 8, 2017*	San Gabriel Valley Water Association Luncheon – location TBD. **(Tentative)**					
Thursday, November 16, 2017*	SCWUA Luncheon at the Pomona Fairplex (3rd Thursday due to Thanksgiving)					
Tuesday – Thursday, November 28- December 1, 2017	ACWA 2017 Fall Conference in Anaheim Marriott Hotel in Anaheim, CA					
Thursday, December 7, 2017*	ACWA 2017 Fall Conference in Anaheim Marriott Hotel in Anaheim, CA (Will be held on 1st Thursday)					

***** SGVWA and SCWUA scheduled program and location TBA at a later date.

SGVWA – San Gabriel Valley Water Association Quarterly Luncheons, are held on the Second Wednesday of February, May, August and November at 11:30 am at the Swiss Park in Whittier CA, (Dates are subject to change)

SCWUA – Southern California Water Utilities Association Luncheons are typically held on the fourth Thursday of each month with the exception of December due to the Christmas holiday and are held at the Pomona Fairplex in Pomona, CA. (Dates are subject to change)

<u>Upcoming Meeting:</u>

- No other meetings at this time.

Board Member Training and Reporting Requirements:

NEXT DUE DATE

Schedule of Future Training and Reporting for 2016	Aguirre	Escalera	Hastings	Hernandez	Rojas
Ethics 1234 **2 year Requirement**	**11/22/18**	**12/01/18**	**12/01/18**	**10/11/18**	**12/04/16**
Sexual Harassment **2 Year Requirement**	**12/01/17**	**12/01/17**	**05/05/17**	**10/10/18**	**05/05/17**
Form 700 **Annual Requirement**	**Complete**	**Complete**	**Complete**	**Complete**	**Complete**
Form 470 Short Form **Semi Annual Requirement**	**07/31/17**	**07/31/17**	**07/31/17**	**07/31/17**	**07/31/17**

If you have any questions on the information provided or would like additional information, please contact me at your earliest convenience.

MEMORANDUM

Date: May 1, 2017

To: ACWA REGION 8 MEMBER AGENCY PRESIDENTS AND GENERAL MANAGERS
(sent via e-mail)

From: ACWA REGION 8 NOMINATING COMMITTEE
Tony Zampiello, Main San Gabriel Basin Watermaster
Nina Jazmadarian, Foothill Municipal Water District
Jerry Gladbach, Castaic Lake Water Agency
Susan Mulligan, Calleguas Municipal Water District

The Region 8 Nominating Committee is looking for ACWA members who are interested in leading the direction of ACWA Region 8 for the 2018-2019 term. The Nominating Committee is currently seeking candidates for the Region 8 Board, which is comprised of Chair, Vice Chair and up to five Board Member positions.

The leadership of ACWA's ten geographical regions is integral to the leadership of the Association as a whole. The Chair and Vice Chair of Region 8 serve on ACWA's Statewide Board of Directors and recommend all committee appointments for Region 8. The members of the Region 8 Board determine the direction and focus of region issues and activities. Additionally, they support the fulfillment of ACWA's goals on behalf of members and serve as a key role in ACWA's grassroots outreach efforts.

If you, or someone within your agency, are interested in serving in a leadership role within ACWA by becoming a Region 8 Board Member, please familiarize yourself with the Role of the Regions and Responsibilities; the Election Timeline; and the Region 8 Rules and Regulations and complete the following steps:

- **Complete the attached Region Board Candidate Nomination Form** HERE
- **Obtain a Resolution of Support from your agency's Board of Directors** (Sample Resolution HERE)
- **Submit the requested information to ACWA as indicated by Friday, June 30, 2017**

The Region 8 Nominating Committee will announce their recommended slate by July 31, 2017. On August 1, 2017 the election will begin with ballots sent to General Managers and Board Presidents. One ballot per agency will be counted. The election will be completed on September 29, 2017. On October 5, 2017, election results will be announced. The newly elected Region 8 Board Members will begin their two-year term of service on January 1, 2017.

If you have any questions, please contact Senior Regional Affairs Representative Brandon Ida at brandoni@acwa.com or (916) 441-4545.

ACWA Region 8
Rules & Regulations

Each region shall organize and adopt rules and regulations for the conduct of its meetings and affairs not inconsistent with the Articles of Incorporation or bylaws of the Association (ACWA Bylaw V, 6.).

Officers

At least one of the chair or vice chair positions must be an elected / appointed director from a member agency.

The term of the chair and the vice chair shall allow for two successive two-year terms allowing a maximum of four consecutive years as chair or vice chair.

The chair will appoint a secretary if one is deemed necessary.

Meetings

The Region 8 board shall approve all region programs and activities.

Region 8 shall have a general membership meeting annually in addition to those meetings at the ACWA conferences.

Attendance

If a region chair or vice chair is no longer allowed to serve on the Board of Directors due to his / her attendance, the region board shall appoint from the existing region board a new region officer. (ACWA Policy & Guideline Q, 1.)

If a region chair or vice chair misses three consecutive region board / membership meetings, the same process shall be used to backfill the region officer position. (ACWA Policy & Guideline Q, 1.)

If a region board member has three consecutive unexcused absences from a region board meeting or general membership business meeting, the region board will convene to discuss options for removal of the inactive board member. If the vacancy causes the board to fail to meet the minimum requirement of five board members, the region must fill the vacancy according to its rules and regulations. (ACWA Policy & Guideline Q, 3.)

Elections

All nominations received for the region chair, vice chair and board positions must be accompanied by a resolution of support from each sponsoring member agency, signed by an authorized representative of the Board of Directors. Only one individual may be nominated from a given agency to run for election to a region board. Agencies with representatives serving on the nominating committees should strive not to submit nominations for the region board from their agency. (ACWA Policy & Guideline P, 2.)

Election ballots will be e-mailed to ACWA member agency general managers and presidents.
The nominating committee shall consist of three to five members.

The nominating committee shall pursue qualified members within the region to run for the region board; consider geographic diversity, agency size and focus in selecting a slate, nominate both elected/appointed officials and staff members as part of the Region 8 board; and preserve objectivity by not nominating a member of the nominating committee for any elected positions being considered.

See the current region election timeline for specific dates.

Endorsements

ACWA, as a statewide organization, may endorse potential nominees and nominees for appointment to local, regional, and statewide commissions and boards. ACWA's regions may submit a recommendation for consideration and action to the ACWA Board of Directors to endorse a potential nominee or nominee for appointment to a local, regional or statewide commission or board. (ACWA Policy & Guideline P, 3.)

Committee Recommendations & Representation

All regions are given equal opportunity to recommend representatives of the region for appointment to a standing or regular committee of the Association. If a region fails to provide full representation on all ACWA committees, those committee slots will be left open for the remainder of the term or until such time as the region designates a representative to complete the remainder of the term. (ACWA Policy & Guideline P, 4. A.)

At the first region board / membership meeting of the term, regions shall designate a representative serving on each of the standing and regular committees to serve as the official reporter to and from the committee on behalf of the region to facilitate input and communication. (ACWA Policy & Guideline P, 4. B.)

The chair and vice chair shall make all committee appointment recommendations to the ACWA committees, to be ratified by the Region 8 board prior to submission to the ACWA president for consideration.

Tours

ACWA may develop and conduct various tours for the regions. All tour attendees must sign a "release and waiver" to attend any and all region tours. Attendees agree to follow environmental guidelines and regulations in accordance with direction from ACWA staff; and will respect the rights and privacy of other attendees. (ACWA Policy & Guideline P, 6.)

Finances

See "Financial Guidelines for ACWA Region Events" document.

Amending the Region Rules & Regulations

ACWA policies and guidelines can be amended by approval of the ACWA Board of Directors.
The Region 8 Rules & Regulations can be amended by a majority vote of those present at any Region 8 meeting as long as a quorum is present.

ACWA
Association of California Water Agencies

REGION BOARD CANDIDATE **NOMINATION FORM**

Name of Candidate: ______________________________

Agency: ______________________ Title: ______________________

Agency Phone: ______________________ Direct Phone: ______________________

E-mail: ______________________ ACWA Region:________ County: ______________________

Address: ______________________________

Region Board Position Preference: (If you are interested in more than one position, please indicate priority – 1st, 2nd and 3rd choice)

☐ Chair____ ☐ Vice Chair ____ ☐ Board Member ____

In the event, you are not chosen for the recommended slate, would you like to be listed on the ballot's individual candidate section? (If neither is selected, your name will **NOT** appear on the ballot.)

☐ Yes ☐ No

Agency Function(s): (check all that apply)

☐ Wholesale ☐ Sewage Treatment ☐ Flood Control
☐ Urban Water Supply ☐ Retailer ☐ Groundwater Management / Replenishment
☐ Ag Water Supply ☐ Wastewater Reclamation ☐ Other: ______________________

Describe your ACWA-related activities that help qualify you for this office:

____

____

____

In the space provided, please write or attach a brief, half-page bio summarizing the experience and qualifications that make you a viable candidate for ACWA Region leadership. Please include the number of years you have served in your current agency position, the number of years you have been involved in water issues and in what capacity you have been involved in the water community.

____

____

____

____

____

I acknowledge that the role of a region board member is to actively participate on the Region Board during my term, including attending region board and membership meetings, participating on region conference calls, participating in ACWA's Outreach Program, as well as other ACWA functions to set an example of commitment to the region and the association.

I hereby submit my name for consideration by the Nominating Committee.
(Please attach a copy of your agency's resolution of support/sponsorship for your candidacy.)

______________________ ______________________ ______________________
Signature Title Date

Submit completed form by **June 30, 2017** to **regionelections@acwa.com**

RESOLUTION NO. _______

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE (DISTRICT NAME) PLACING IN NOMINATION (NOMINEE NAME) AS A MEMBER OF THE ASSOCIATION OF CALIFORNIA WATER AGENCIES REGION ___ (POSITION)

BE IT RESOLVED BY THE BOARD OF DIRECTORS OF (DISTRICT NAME) AS FOLLOWS:

A. Recitals

(i) The Board of Directors (Board) of the (District Name) does encourage and support the participation of its members in the affairs of the Association of California Water Agencies (ACWA).

(ii) (Nominee Title), (Nominee Name) is currently serving as (Position) for ACWA Region ___

and/or

(iii) (Nominee Name) has indicated a desire to serve as a (Position) of ACWA Region ____.

B. Resolves

NOW, THEREFORE, BE IT RESOLVED THAT THE BOARD OF DIRECTORS OF (DISTRICT NAME),

(i) Does place its full and unreserved support in the nomination of (Nominee Name) for the (Position) of ACWA Region ____.

(ii) Does hereby determine that the expenses attendant with the service of (Nominee Name) in ACWA Region ____ shall be borne by the (District Name).

Adopted and approved this ____ day of ____ (month) 2017.

____

(Nominee Name), (Title)
(District Name)

(SEAL)

ATTEST:

____
(Secretary Name), Secretary

I, (SECRETARY NAME), Secretary to the Board of Directors of (District Name), hereby certify that the foregoing Resolution was introduced at a regular meeting of the Board of Directors of said District, held on the ____ day of ____ (month) 2017, and was adopted at that meeting by the following role call vote:

AYES:

NOES:

ABSENT:

ATTEST:

____
(Secretary Name), Secretary to the
Board of Directors of
(District Name)

County of Los Angeles
REGISTRAR-RECORDER/COUNTY CLERK
Election Information and Preparation
P.O. BOX 30450
LOS ANGELES, CA 9XXXX-XXXX

1X

X

OFFICIAL ELECTION MAIL
Authorized by the U.S. Postal Service

FIRST CLASS MAIL
U.S. POSTAGE PAID
LOS ANGELES, CA
PERMIT NO 36426

LA PUENTE VALLEY COUNTY WATER DISTRICT

IMPORTANT ELECTION INFORMATION

To: All registered voters in La Puente Valley County Water District

NOTICE IS HEREBY GIVEN, pursuant to California Elections Code § 10404 (f), that the date of the General Municipal election in La Puente Valley County Water District and the date of the Governing Board Member election in the La Puente Valley County Water District have been changed from the first Tuesday after the first Monday in November of odd years to the first Tuesday after the first Monday in November of even years, effective November 2018. The terms of all current elected officeholders will be extended by one year. More information may be obtained by calling the District office, Office Administrator or General Manager at (626) 330-2126.

Next Lunch Meeting

Thursday—May 25

11:30 a.m. to 1:30 p.m.

At the Sheraton Fairplex

Our Speaker will be:

Geoff Shaw

Planning and Intelligence Chief for the
Department Operations Center
for the Department of Water Resources

The Oroville Dam

SCWUA
SOUTHERN CALIFORNIA WATER UTILITIES ASSOCIATION

Date:	**Thursday, May 25, 2017**	**Time:**	**11:30 a.m. to 1:30 p.m.**
Where:	**Pomona Fairplex Sheraton** 601 W McKinley Ave, Pomona	**Cost:**	**$30.00 – payable at the door**
		RSVP:	**By Monday, May 22**

Three Ways to Register

1	**Online:** www.scwua.org	2	**Email:** www.facebook.com/scwua	3	**Phone:** (909) 293-7040

Credit cards may only be used for payment of pre-reservations. Credit cards are NOT accepted at the door—only cash or check