AGENDA

REGULAR MEETING OF THE BOARD OF DIRECTORS
LA PUENTE VALLEY COUNTY WATER DISTRICT
112 N. FIRST STREET, LA PUENTE, CALIFORNIA
MONDAY, JUNE 12, 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 May 22, 2017.

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

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

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

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

7. ACTION/DISCUSSION ITEMS

A. Discussion Regarding the District's Water Conservation Regulations.
Recommendation: Board Discretion.

B. Discussion Regarding the 2016 Consumer Confidence Reports.
Recommendation: Board Discretion

C. Consideration of Memorandum of Understanding (MOU) Regarding Public Water Agencies Group (PWAG) Emergency Preparedness Coordinator Position.
Recommendation: Approve the MOU for PWAG's Emergency Preparedness Coordinator Position.

D. Review of the City of Industry Waterworks System 2017 Water Master Plan.
Recommendation: Receive and File.

8. GENERAL MANAGER'S REPORT

9. OTHER ITEMS

A. Upcoming Events.

B. Correspondence to the Board of Directors.

10. ATTORNEY'S COMMENTS

11. BOARD MEMBER COMMENTS

A. Report on Events Attended.

B. Other Comments.

12. FUTURE AGENDA ITEMS

13. CLOSED SESSION

Conference with Legal Counsel – Anticipated Litigation. Significant Exposure to Litigation Pursuant to Government Code § 54956.9(d)(2): (One Case)

14. REPORT ON CLOSED SESSION

15. ADJOURNMENT

POSTED: Friday, June 9, 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, May 22, 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 5:34 pm.

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

Directors Present:
David Hastings, President; Charles Aguirre, Director; John P. Escalera and Henry Hernandez, Director.

Director Absent:
William R. Rojas, Vice President.

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:
No members of the public present.

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

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

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

> Approval of the Minutes of the Regular Meeting of the Board of Directors held on May 15, 2017.

Motion by President Hastings, seconded by Director Aguirre, 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 April 30, 2017.

- Mr. Galindo presented the cash and investment summary. The District's total cash and investments total over $3.4M. The Industry Public Utilities Water Operations checking account balance is $676,645.

Motion by Director Aguirre, seconded by Director Hernandez, to receive and file the Statement of the District's Revenues and Expenses as of April 30, 2017, as presented.

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

B. Statement of the District's Revenues and Expenses as of April 30, 2017.

- Mrs. Herrera summarized the Statement of Revenues and Expenses for the District and Treatment plant operations.
- Director Escalera asked if the water sales revenues are in line for this time of the year. Mrs. Herrera responded that for this time of the year, the revenues are slightly higher than prior year and also we have not yet hit our heavy months of August and September. She added that Customers are continuing to conserve water.

After further discussion, motion by Director Escalera, seconded by Director Hernandez, to receive and file the Statement of the District's Revenues and Expenses as of April 30, 2017, as presented.

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

C. Statement of the City of Industry Waterworks System's Revenues and Expenses as of April 30, 2017.

- Mrs. Herrera summarized the Statement of Revenues and Expenses for the City of Industry Waterworks System. She stated that we are approaching the end of the fiscal year and to date, we remain on target.

Motion by President Hastings, seconded by Director Aguirre, to receive and file the Statement of the City of Industry Waterworks System's Revenues and Expenses as of April 30, 2017, as presented.

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

Action/Discussion Items:

Discussion on District's 2017 Summer Newsletter.

- Mr. Galindo presented the District's Draft 2017 Summer Newsletter. Some of the major topics are Water Conservation, even though the drought is over, conservation will be a way of life in California; Conservation measures; the new BPOU Project Agreement which was recently approved for ten more years; and how the District is dedicated to maintaining low water rates.
- Mr. Galindo stated the Newsletters will be mailed to District Customers by the end of June and posted on the District's website. Spanish Newsletter will be made available upon request and also posted on the website.

After further discussion, motion by Director Aguirre, seconded by President Hastings, to approve the District's 2017 Summer Newsletter.

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

Project Engineer's Report:
Mr. Frausto provided updates on two developments.

- He provided an update and layout of the Del Valle Project. An agreement has been drafted and provided to the developer for their review. Once we receive their comments, it will be reviewed by District's Counsel for final approval. This development has been reviewed by the City of La Puente and has been approved to proceed.
- He presented the status on the Star Theatre Project, which is a proposed 22 condominium development. Currently, the property is going through a CEQA process and this could impact whether or not the old theatre can be destructed. Mr. Galindo added that after further research, it is not registered as a cultural landmark. Mr. Frausto will keep the Board updated on the developments of this project.

There was further discussion, but no action is required at this time.

General Manager's Report:

- Mr. Galindo provided an update on the PVOU IZ project. Northrop Grumman and Suburban Water Systems have almost reached an agreement and Suburban to receive water from the PVOU IZ plant. The definitive agreements will be updated. The Project is moving along nicely and Northrop is in the process of drafting an Operation Maintenance and Operating Plan.
- Mr. Galindo has asked the Board President to nominate an Ad hoc Committee to start assessing our staffing and what type of reorganization may be needed once the District takes on the new responsibility of the PVOU IZ plant. Director Escalera and President Hastings express that they would like to serve on the Staffing Assessment Ad hoc Committee. Mr. Galindo also recommended to the Board President to select an alternate in case there are any scheduling conflicts. With some discussion, a committee will be named at the next Board meeting due to the absence of Vice President Rojas.
- Mr. Galindo updated the Board on the Single Pass Ion Exchange resin change out. He stated that we will be due for the first out of the four change outs within the next 30 days. The change out will be done by Evoqua. We are also working with DDW to acquire the permission to utilize the PSR2 Plus resin.
- Mr. Galindo stated that the Water Conservation Regulation we currently have in place will need to be modified, since the State has changed the emergency conservation regulations. He stated this will be discussed at the next Board meeting to review the current conservation regulations and decide what changes the Board would like to make.

Information Items:

A. Upcoming Events.

- Mrs. Ruehlman provided an update on the upcoming events for 2017, and who will be attending.
- She also reminded the Board that the next SCWUA on May 25, 2017, will be held at the Conference Center next door to the Sheraton Hotel at the Pomona Fairplex.

B. Correspondence to the Board of Directors.
No comments on correspondence provided.

Attorney Comments:
Mr. Trinh had no comments.

Board Member Comments:

A. Report on events attended.

- President Hastings and Director Escalera reported their attendance to the San Gabriel Valley Water Association Quarterly Luncheon on May 17th at the South Hills Country Club in West Covina.
- Director Escalera attended the Water 101 on May 16th at the Upper District in Monrovia.

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 6:20 p.m.

David Hastings, President

Rosa B. Ruehlman, Secretary

La Puente Water District May 2017 Disbursements

Check #	Payee		Amount	Description
4728	Chevron	$	1,617.14	Truck Fuel
4729	Colby Pest Control Service	$	75.00	Bee Removal
4730	Fedak & Brown LLP	$	3,314.00	2016 Audit Expense
4731	Ferguson Enterprises Inc	$	17.90	Field Supplies
4732	Ferguson Waterworks	$	753.59	Meter Expense
4733	Highroad IT	$	402.00	Technical Support
4734	Industry Public Utilites	$	28,145.17	Web Payments April 2017
4735	Merritt's Hardware	$	279.98	Field Supplies
4736	S & J Supply Co Inc	$	434.02	Field Supplies
4737	SC Edison	$	5,445.44	Power Expense
4738	State Water Resource Control Board	$	11,488.00	Water System Fee's
4739	Time Warner Cable	$	261.62	Telephone Service
4740	Underground Service Alert	$	72.00	Line Notifications
4741	Weck Laboratories Inc	$	346.50	Water Sampling
4742	Wesco Security Systems Inc	$	282.00	Security Monitoring Service
4743	Merritt's Hardware	$	53.89	Field Supplies
4744	So Cal Industries	$	140.00	Restroom Service @ Treatment Plant
4745	Time Warner Cable	$	519.10	Telephone Service
4746	Waste Management of SG Valley	$	190.84	Trash Service
4747	Konecranes	$	289.00	Quarterly Inspection & Maintenance
4748	McMaster-Carr Supply Co	$	119.87	Field Supplies
4749	Northstar Chemical	$	3,118.74	Chemicals Expense
4750	Pall Filter Specialists Inc	$	6,624.66	Filters
4751	Tri County Pump Company	$	12,763.19	Booster Pump Repairs
4752	Trojan UV	$	67,106.80	UV Lamp Installation & Qtrly Service Contract
4753	Weck Laboratories Inc	$	3,604.50	Water Sampling
4754	Weck Laboratories Inc	$	1,683.00	Water Sampling
4756	State Water Resources Control Board	$	90.00	T-3 Renewal - Cesar Ortiz
4757	David H Hastings	$	466.89	ACWA 2017 Spring Conference Expenses
4758	Three D Service Co	$	1,029.40	Construction Meter Refund
4759	Andy Chen	$	599.99	Household Retrofit Program
4760	American Cancer Society	$	200.00	Relay for Life Donation
4761	Answering Service Care	$	74.51	Answering Service
4762	Bank of America-Visa	$	269.59	Administrative Expenses
4763	CCSInteractive	$	54.40	Monthly Website Hosting
4764	Citi Cards	$	243.44	Administrative Expenses
4765	Civiltec Engineering Inc	$	4,906.50	General, Master Plan & Del Valle Project
4766	County Sanitation Dists of LA County	$	166.00	Refuse Fee's
4767	Discount Tree Services	$	2,200.00	Property Maintenance

La Puente Water District May 2017 Disbursements - continued

Check #	Payee		Amount	Description
4768	Ed Butts Ford	$	473.51	Truck Maintenenace
4769	Ferguson Waterworks	$	307.47	Meter Expense
4770	Firestone Auto Care	$	558.67	Truck Maintenenace
4771	Hacienda Lawnmower	$	57.22	Truck Maintenenace
4772	InfoSend	$	927.83	Billing Expense
4773	Jack Henry & Associates	$	48.00	Web E-Check Fee's
4774	Lagerlof, Senecal, Gosney & Kruse	$	6,779.75	Attorney Fee's
4775	Mancilla's Quality Printing	$	30.45	Administrative Expenses
4776	MJM Communications & Fire	$	424.00	Security Monitoring
4777	O'Reilly Auto Parts	$	154.78	Truck Maintenenace
4778	Peck Road Gravel	$	450.00	Asphalt & Concrete Disposal
4779	Platinum Consulting Group	$	5,177.50	Administrative Support
4780	S & J Supply Co Inc	$	128.87	Field Supplies - Inventory
4781	San Gabriel Valley Water Company	$	163.04	Water Service @ Treatment Plant
4782	SC Edison	$	104.81	Power Expense
4783	South Coast Air Quality Mgmt Dist	$	250.94	Permit Processing Fee's
4784	Time Warner Cable	$	231.76	Telephone Service
4785	Trench Plate Rental Co	$	588.98	Equipment Rental
4786	Valley Vista Services	$	296.64	Trash Service
4787	Weck Laboratories Inc	$	159.50	Water Sampling
4788	Western Water Works	$	444.82	Field Supplies - Inventory
4789	Henry P Hernandez	$	628.33	ACWA 2017 Spring Conference Expenses
4790	Christina Moon	$	25.08	Customer Overpayment Refund
4791	ACWA/JPIA	$	30,706.57	Health Benefits
4792	AWWA	$	420.00	Agency Membership
4793	Citi Cards	$	524.32	Office & Administrative Expenses
4794	Ferguson Enterprises Inc	$	16.30	Field Supplies
4795	G. M. Sager Construction	$	4,000.00	Patch Work
4796	Grainger Inc	$	41.24	Field Supplies
4797	Industry Hose & Fasteners	$	120.20	Field Supplies
4798	Lincoln National Life Insurance Company	$	593.96	Disability Insurance
4799	McMaster-Carr Supply Co	$	68.88	Field Supplies
4800	MetLife	$	285.99	Life Insurance
4801	Resource Building Materials	$	117.41	Field Supplies
4802	S & J Supply Co Inc	$	2,192.05	Field Supplies - Tools & Inventory
4803	Staples	$	200.09	Office Supplies
4804	Vulcan Materials Company	$	279.04	Field Expense - Asphalt
4805	Western Water Works	$	1,522.40	Field Supplies - Inventory
4806	So Cal Water Utilities Association	$	180.00	Seminar Expense

La Puente Water District May 2017 Disbursements - continued

Check #	Payee		Amount	Description
4807	Verizon Wireless	$	504.79	Cell Phone Service
4808	Premier Access Insurance Co	$	2,801.74	Dental Insurance
4809	Main SG Basin Watermaster	$	803.89	BPOU Negotiations Mediation
4810	Intellicom Communications Inc	$	1,748.44	Telephone System
4811	Highroad IT	$	17,693.19	Office Server Expense
4812	CA-NV Section AWWA	$	80.00	Cross-Connection Renewal Greg Galindo
4813	Petty Cash	$	55.15	Office/Field Expense
4814	SC Edison	$	23,401.03	Power Expense
Online	Home Depot	$	386.21	Field Supplies
Autodeduct	Wells Fargo	$	171.79	Merchant Fee's
Autodeduct	Wells Fargo	$	413.90	Bank Fee's
Autodeduct	First Data Global Leasing	$	60.76	Credit Card Machine Lease
Autodeduct	Bluefin Payment Systems	$	772.46	Web Merchant Fee's
On-line	United States Treasury	$	24,053.78	Federal, Social Security & Medicare Taxes
On-line	EDD	$	3,863.79	California State & Unemployment Taxes
On-line	Lincoln Financial Group	$	3,954.00	Deferred Comp
On-line	CalPERS	$	13,206.68	Retirement Program
	Total Payments	**$**	**313,100.67**	

La Puente Valley County Water District
Payroll Summary
May 2017

	May 2017
Wages, Taxes and Adjustments	
Gross Pay	
Total Gross Pay	99,289.88
Deductions from Gross Pay	
457b Plan Employee	-3,954.00
CalPers EEC	-1,000.75
MetLife	-97.12
Total Deductions from Gross Pay	-5,051.87
Adjusted Gross Pay	94,238.01
Taxes Withheld	
Federal Withholding	-8,833.00
Medicare Employee	-1,442.50
Social Security Employee	-6,167.89
CA - Withholding	-3,862.75
Medicare Employee Addl Tax	0.00
Total Taxes Withheld	-20,306.14
Net Pay	73,931.87
Total Employer Taxes and Contributions	7,803.43

La Puente Water District May 2017 Disbursements

Total Vendor Payables	**$ 313,100.67**
Total Payroll	**$ 73,931.87**
Total May 2017 Disbursements	**$ 387,032.54**

Invoice No. 4- 2017-05

June 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 May 2017.

BPOU Acct No.	Description	Invoice No.	Vendor	Amount	Subtotal
LP.02.01.01.00	Power	2-15-629-6188	SC Edison	$ 12,845.66	
		2-03-187-2179	SC Edison	$ 10,555.37	$ 23,401.03
LP.02.01.02.00	Labor Costs	May-17	LPVCWD	$ 22,424.50	$ 22,424.50
LP.02.01.05.00	Transportation	May-17	LPVCWD - 1410 miles @ .535	$ 754.35	$ 754.35
LP .02.01.07.00	Water Testing	W7D1486	Weck Lab	$ 331.50	
		W7E0387	Weck Lab	$ 226.50	
		W7E0388	Weck Lab	$ 159.00	
		W7E0565	Weck Lab	$ 159.00	
		W7E0685	Weck Lab	$ 56.00	
		W7E0859	Weck Lab	$ 200.00	
		W7E0860	Weck Lab	$ 226.50	
		W7E1701	Weck Lab	$ 56.00	$ 1,414.50
LP.02.01.10.00	Operations Monitoring	9462; 05/17	Time Warner Cable	$ 219.10	
		2906; 05/17	Time Warner Cable	$ 300.00	$ 519.10
LP.02.01.12.00	Materials/Supplies				
LP.02.01.12.06	Sodium Hypochlorite	102241	Northstar Chemical	$ 1,433.67	
		102780	Northstar Chemical	$ 1,638.86	
		103437	Northstar Chemical	$ 1,595.38	$ 4,667.91
LP.02.01.12.15	Other Expendables	9449870642	Grainger	$ 166.13	
		10470044	HACH	$ 699.93	
		561420	Home Depot	$ 13.95	
		4562174	Home Depot	$ 30.17	
		098564	Merritt's	$ 28.25	
		098603	Merritt's	$ 13.04	$ 951.47
LP.02.01.12.17	Sulfuric Acid	102265	Northstar Chemical	$ 2,090.30	$ 2,090.30
LP.02.01.14.00	Repair/Replacement	001R9934	Harrington Plastics	$ 346.53	
		001R9935	Harrington Plastics	$ 657.36	
		3617300520	Hopkins Technical Products	$ 707.32	
		27065608	McMaster-Carr	$ 194.86	
		28498529	McMaster-Carr	$ 59.94	
		28741708	McMaster-Carr	$ 65.71	
		28918608	McMaster-Carr	$ 59.35	
		241298	USA Bluebook	$ 396.70	
		241304	USA Bluebook	$ 274.89	
		242013	USA Bluebook	$ 137.34	
		242014	USA Bluebook	$ 127.02	$ 3,027.02
LP.02.01.15.00	Contractor Labor	982522	Locus Technologies	$ 336.00	$ 336.00
LP.02.01.80.00	Other O & M	19-Apr	Citi Cards USPS PO	$ 23.75	
		May-17	Fedak & Brown LLP	$ 500.00	
		19657	HighRoad IT	$ 134.00	
		13542	MJM Communications	$ 262.88	
		30372	Platinum Consulting Group	$ 1,134.38	
		30343	Platinum Consulting Group	$ 650.00	
		270373	So Cal Industries	$ 140.00	
		1800694961	Staples	$ 5.75	
		1807495861	Staples	$ 76.33	
		51226	Staples	$ 73.93	
		9935274-2519-9	Waste Management	$ 190.84	$ 3,191.86
			Total Expenditures		$ 62,778.04
			District Pumping Cost Deduction		$ 13,330.72
			Total O & M		$ 49,447.32
			Total Capital Cost Reimbursable		$ -
			Total Cost Reimbursable		**$ 49,447.32**

Industry Public Utilities May 2017 Disbursements

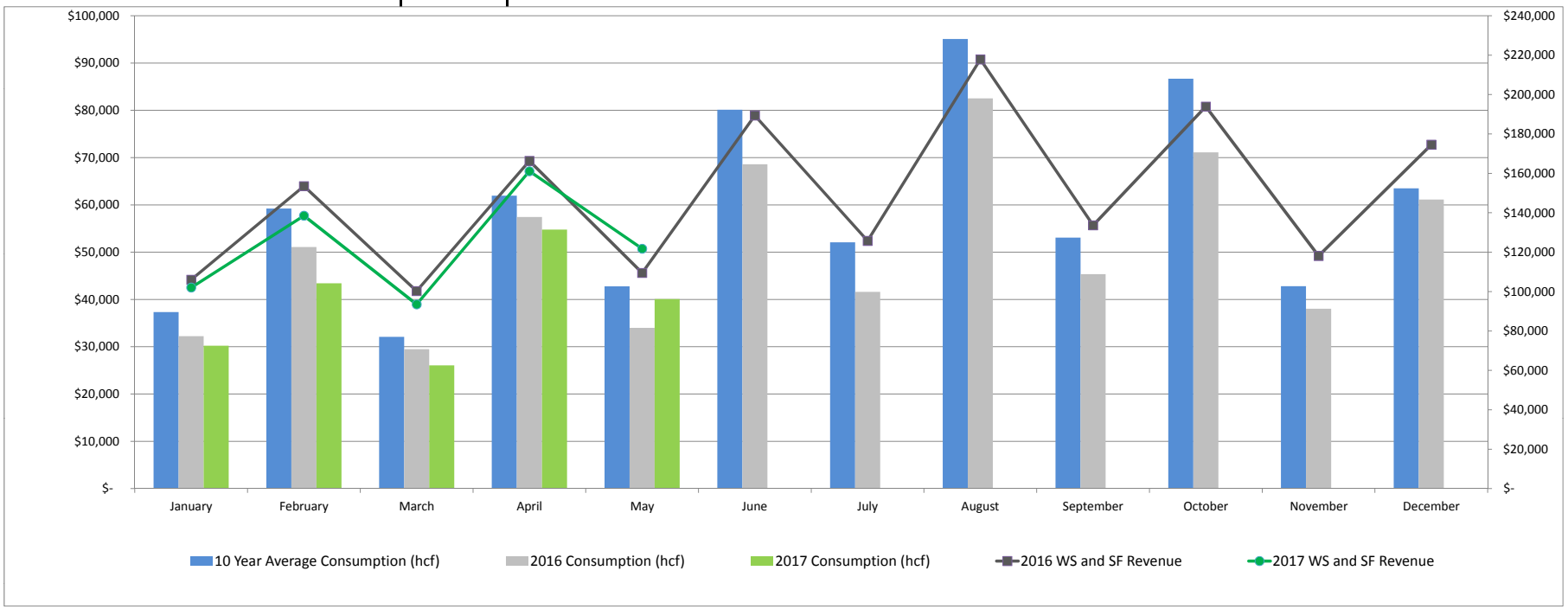
Check #	Payee		Amount	Description
2572	City of Whittier	$	244,926.50	Lease of Water Rights
2573	Ferguson Waterworks	$	497.50	Software Maintenance
2574	Highroad IT	$	268.00	Technical Support
2575	La Puente Valley County Water District	$	55,590.12	Labor Costs April 2017
2576	Merritt's Hardware	$	307.05	Field Supplies
2577	S & J Supply Co Inc	$	98.42	Field Supplies
2578	Time Warner Cable	$	51.60	Telephone Service
2579	Time Warner Cable	$	261.62	Telephone Service
2580	U.S. Postal Service	$	284.00	PO Box Renewal 05/17 - 05/18
2581	Underground Service Alert	$	72.00	Line Notifications
2582	Weck Laboratories Inc	$	463.50	Water Sampling
2583	Arthur Serna	$	9.22	Customer Overpayment Refund
2584	Answering Service Care	$	74.50	Answering Service
2585	CCSInteractive	$	13.60	Monthly Website Hosting
2586	Civiltec Engineering Inc	$	548.10	General Services & Master Plan Expenses
2587	Ferguson Enterprises Inc	$	36.61	Field Supplies
2588	G. M. Sager Construction	$	15,883.25	Patch Work - Industry Hills
2589	InfoSend	$	696.25	Billing Expense
2590	Jack Henry & Associates	$	63.00	Web E-Check Fee's
2591	La Puente Valley County Water District	$	593.18	Web CC & Bank Fee's Reimbursement
2592	McCalls Meter Sales & Service	$	2,083.73	Meter Replacement - Industry Hills
2593	Peck Road Gravel	$	450.00	Asphalt & Concrete Disposal
2594	Platinum Consulting Group	$	117.50	Administrative Support
2595	S & J Supply Co Inc	$	2,163.82	Meter Installations - Industry Hills
2596	SoCal Gas	$	18.06	Gas Expense
2597	Weck Laboratories Inc	$	107.50	Water Sampling
2598	Bill Wright's Paint	$	277.28	Property Maintenance
2599	Ferguson Waterworks	$	9,791.67	Meter Installations - Industry Hills
2600	Grainger Inc	$	41.24	Field Supplies
2601	Industry Public Utility Commission	$	536.71	Industry Hills Power Expense
2602	McMaster-Carr Supply Co	$	68.87	Field Supplies
2603	Resource Building Materials	$	117.40	Field Supplies
2604	S & J Supply Co Inc	$	159.09	Field Supplies
2605	San Gabriel Valley Water Company	$	1,310.51	Purchased Water - Salt Lake
2606	SC Edison	$	8,942.54	Power Expense
2607	SoCal Gas	$	14.30	Gas Expense
2608	Staples	$	44.06	Office Supplies
2609	Verizon Wireless	$	504.78	Cell Phone Service

Industry May 2017 Disbursements - continued

Check #	Payee		Amount	Description
2610	Vulcan Materials Company	$	279.03	Field Expense - Asphalt
2611	Intellicom Communications Inc	$	1,748.44	Telephone System
2612	Time Warner Cable	$	51.60	Telephone Service
2613	Petty Cash	$	52.98	Office/Field Expense
Online	Home Depot	$	92.45	Field Supplies
Autodeduct	Wells Fargo Merchant Fee's	$	53.06	Merchant Fee's
Autodeduct	First Data Global Leasing	$	60.76	Credit Card Machine Lease
	Total May 2017 Disbursements	**$**	**349,825.40**	

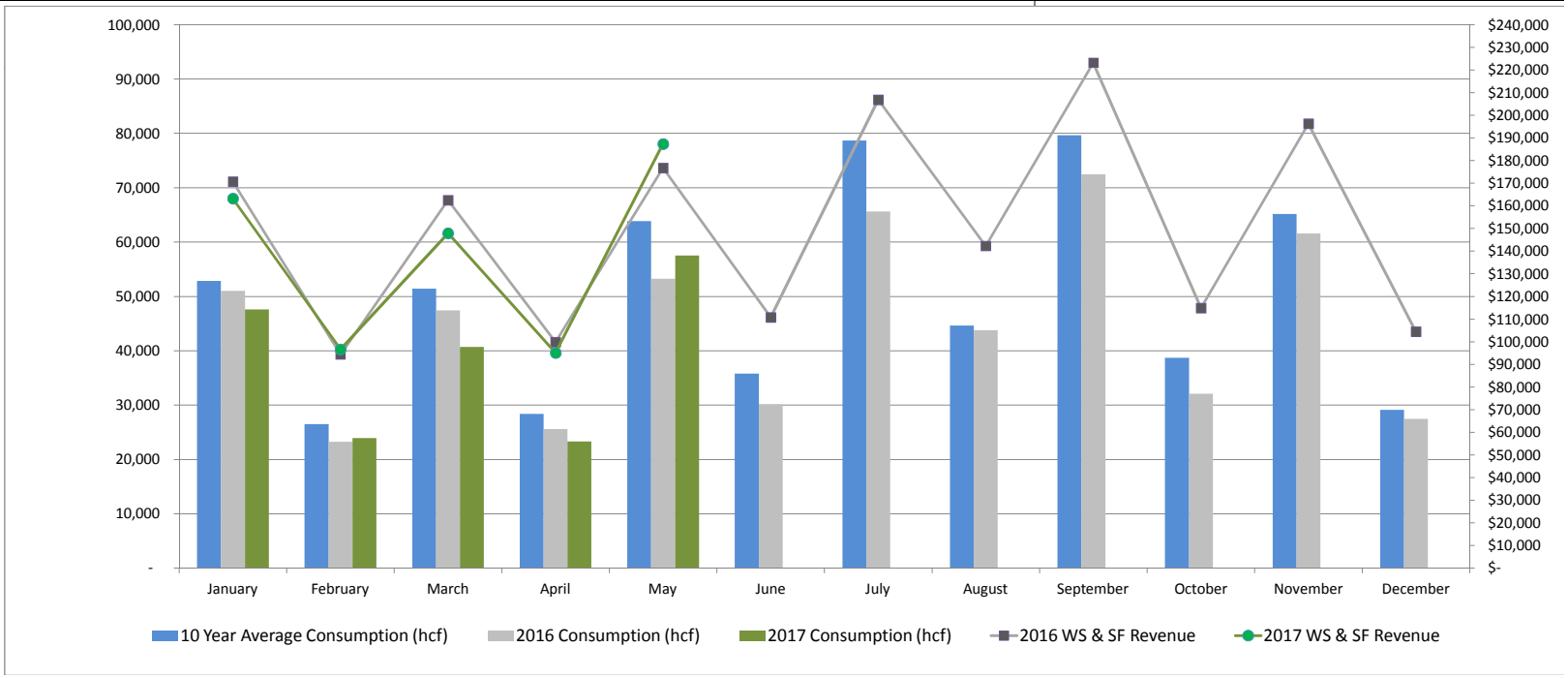
WATER SALES REPORT LPVCWD 2017

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	**1,186**	-	-	-	-	-	-	-	**6,010**
2017 Consumption (hcf)	30,207	43,404	26,046	54,765	**40,068**	-	-	-	-	-	-	-	**194,490**
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	**$ 76,176**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 370,919**
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	**$ 45,577**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 246,021**
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	**$ 950**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 4,750**
2017 DC Fees	$ 317	$ 6,962	$ 380	$ 7,014	**$ 409**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 15,082**
2017 System Revenue	$ 103,318	$ 146,431	$ 94,852	$ 169,059	**$ 123,111**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 636,772**



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	**961**	-	-	-	-	-	-	-	**4,578**
2017 Consumption (hcf)	47,606	23,933	40,733	23,336	**57,513**	-	-	-	-	-	-	-	**193,121**
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	**$ 130,423**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 431,746**
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	**$ 56,897**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 258,357**
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	**$ 1,575**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 5,225**
2017 DC Fees	$ 10,901	$ 2,511	$ 11,617	$ 2,578	**$ 11,526**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 39,133**
2017 System Revenues	$ 175,685	$ 99,379	$ 161,119	$ 97,857	**$ 200,421**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 734,462**



Memo

To: Honorable Board of Directors

From: Greg B. Galindo, General Manager

Date: June 9, 2017

Re: District's Water Conservation Regulations

Summary

At the upcoming Board meeting, staff will provide an overview of recent changes to the State's water conservation regulations along with the current condition of the Main San Gabriel Groundwater Basin. As you may recall, the Board adopted resolutions in 2014, 2015 and 2016 in response to the state-wide drought and the State's regulations on water conservation. The last resolution on water conservation adopted by the Board was Resolution No. 240 (June 2016). This resolution updated the District's Emergency Water Conservation Regulations, which remain in effect. This resolution is enclosed for your reference. Below is a summary of the District's current water conservation regulations:

1. Outdoor watering limited to (3) days per week.
2. No watering for 48 hours after rainfall.
3. Parks and schools watering limited to four (4) days per week.
4. No watering with potable water of ornamental landscapes, lawns, or other turfs on public street medians is permitted.
5. Water run-off is prohibited.
6. Washing down paved surfaces is prohibited.
7. Washing of vehicles or other types of equipment must be done only with a hand-held nozzle with shut-off.
8. No potable water may be used to clean, fill or maintain levels in decorative fountains or ponds unless such water is part of a recirculating system.
9. All customers must repair leaks promptly.
10. Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily.

At the upcoming meeting, staff would also like to discuss potential changes to the District's water conservation regulations, specifically the appropriate number of days the District should limit outdoor watering, when taking into consideration the current Basin conditions.

Respectfully Submitted,

Greg B. Galindo

General Manager

Enclosure - District's Resolution No. 240

RESOLUTION NO. 240

RESOLUTION OF THE BOARD OF DIRECTORS OF LA PUENTE VALLEY COUNTY WATER DISTRICT RESCINDING RESOLUTION NO. 229 AND UPDATING THE EMERGENCY WATER CONSERVATION RESTRICTIONS

WHEREAS, the La Puente Valley County Water District ("District") is a water district empowered to provide water service within District boundaries; and

WHEREAS, the District adopted Resolution No. 229 on May 26, 2015 Redeclaring Emergency Conservation Restrictions consistent with the Governor of California's Executive Order No. B-29-15 issued on April 1, 2015 and with regulations imposed by the State Water Resources Control Board ("SWRCB"); and

WHEREAS, on May 9, 2016, Governor Edmund G. Brown Jr. issued another executive Order No. B-37-16 directing actions aimed at using water wisely, reducing water waste, and improving water efficiency and directed the SWRCB to adjust emergency water conservation regulations for urban water conservation in response to the changing water supply conditions across the state; and

WHEREAS, Statewide precipitation over the past year has been variable with Northern California having received above-average rainfall, while much of southern California continues to experience below-average rainfall, inadequate snowfall, and warm temperatures and, consequently, while major Northern California water reservoirs are near or above average water storage for this time of year, many Southern California reservoirs are significantly below average; and

WHEREAS, in Southern California, imported water supplies from the State Water Project continue to be curtailed and groundwater supplies are limited in nature; and

WHEREAS, the Main San Gabriel Groundwater Basin (the "Basin"), which the District relies upon as its primary source of water to meet its customers' needs, remains close to its historic low level, which is far below the preferred operating range for the Basin; and

WHEREAS, Water Code section 1058.5 grants the State Water Resources Control Board ("SWRCB") the authority to adopt emergency regulations in drought years in order to: "prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation"; and

WHEREAS, on May 18, 2016, the SWRCB adopted new emergency water conservation regulations that will replace the state-developed standards with locally developed water conservations standards based on each agency and urban water supplier's specific circumstances; and

WHEREAS, following the making of findings as required by law in accordance with Water Code Section 375, the District has the power and authority to adopt mandatory water conservation measures within its boundaries; and

WHEREAS, the District is required to comply with State law, including regulations adopted by the SWRCB, codified at Title 23 of the California Code of Regulations and is authorized pursuant thereto to implement its requirements; and

WHEREAS the District must comply with the SWRCB emergency water conservation regulations by taking actions to mandate reduction of water use within its service area;

NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors of the La Puente Valley County Water District as follows:

Section 1: Rescission of Resolution 229. The Board of Directors of the La Puente Valley County Water District hereby rescinds Resolution 229 adopted on May 26, 2015.

Section 2: Findings. The Board of Directors of the District hereby finds and declares:

a. Supplies available to Southern California water suppliers that receive water from the State Water Project remain curtailed.

b. The lack of rainfall limits the natural replenishment of groundwater basins and limitations on imported water preclude the use of such imported water to replenish groundwater basins, and continued production of groundwater without proportionate recharge of the Basin could result in irreparable damage to the storage capacity of the Basin aquifers and impair the long-term water delivery capability of the District.

c. Should existing drought conditions continue, or should the District lose its water production capacity, there may be insufficient water available for human consumption, sanitation and fire protection.

Section 3: Determination of Need for Water Conservation Measures. The District's Board of Directors, in accordance with the foregoing findings, hereby determine and declare that the regulations and restrictions on delivery and consumption of water within its service area as hereinafter set forth are necessary, in the sound discretion of the Board of Directors, to conserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection.

Section 4: Authorization to Implement Restrictions on Water Consumption. The District's Board of Directors hereby authorizes the District's General Manager to take specific steps to implement the required water use restrictions as hereinafter set forth.

Section 5: Mandatory Conservation Actions. The General Manager of the District shall take all steps necessary to advise the District's customers of the following mandatory water conservation actions and to enforce them in accordance with applicable law and District policy:

a. **Outdoor Landscapes**: Unless recycled water is utilized, the following restrictions apply to the irrigation of outdoor landscapes:

i. No ornamental landscape, lawn or other turf area shall be watered more often than three (3) days per week (for the purposes of this Section, a week shall be deemed to commence at 12:01 a.m. on Sunday morning and end at midnight on the following Saturday night) and is prohibited between the hours of 9 a.m. and 6 p.m.

ii. No ornamental landscape, lawn or other turf area shall be watered on a day with measurable rainfall (0.01 inches of rain or greater) or within 48 hours thereafter.

iii. Parks and schools shall be prohibited from watering its athletic fields more often than four (4) days per week.

iv. There shall be no watering of ornamental landscapes, lawns, or other turf on public street medians.

v. There shall be no watering of landscapes, lawns, or other turf outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

b. **General Restrictions**: The following restrictions apply to all end-users of potable water:

i. No users shall cause or allow water to run off landscape areas into adjoining streets, sidewalks, or other paved areas due to incorrectly directed or maintained sprinklers or excessive watering.

ii. There shall be no application of potable water to driveways, sidewalks, patios, parking areas or other paved surfaces.

iii. Washing of motor vehicles, trailers, boats and other types of equipment shall be done only with a hand-held nozzle or other device that causes the water hose to cease dispensing water immediately when not in use (except as to reclaimed wastewater or by a commercial car wash using recycled water)

iv. No potable water shall be used to clean, fill or maintain levels in decorative fountains, ponds, lakes or other similar aesthetic structures unless such water is part of a recirculating system.

v. All water users shall promptly upon discovery repair all leaks from indoor and outdoor plumbing fixtures.

iii. Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily, and notice of this option must be prominently displayed in each guestroom using clear and easily understood language.

vii. The use of water from fire hydrants shall be limited to fire fighting and related activities and other uses of potable water for municipal purposes shall be limited to activities necessary to maintain the public health, safety, and welfare.

c. **Exemptions**: The following uses are exempt from the restrictions of this Section 5:

i. Watering of athletic fields is permitted at any time if reasonably necessary for the health and safety of the individuals using said athletic field.

ii. Modified watering schedules approved in advance by the District to accommodate public use.

iii. Maintenance activities requiring potable water use approved in advance by the District.

iv. Ongoing water system improvement projects utilizing construction meters in accordance with standard District policy.

Section 6: Duration of Water Emergency. The regulations, restrictions, and actions set forth herein shall remain in effect until repealed or amended by the District's Board of Directors.

Section 7: Violation. A violation of the regulations and restrictions set forth herein will result in the following warnings, penalties, and restrictions imposed by the District:

a. **First Violation**. The District shall issue a written door-hanger notification and cause it to be personally placed at the customer's address where the violation occurred.

b. **Second Violation.** The District shall issue a written door-hanger notification and cause it to be personally placed at the customer's address where the violation occurred, and also send a written letter by United States mail notifying the customer of the repeat violation as well as the penalties that shall be imposed for any subsequent violations.

c. **Third Violation.** The District shall issue a written door-hanger notification and cause it to be personally placed at the customer's address where the violation occurred, send a written letter by United States mail notifying the customer of the repeat violation, and assess a charge of $100.00.

d. **Fourth Violation.** The District shall issue a written door-hanger notification and cause it to be personally placed at the customer's address where the violation occurred, send a written letter by United States mail notifying the customer of the repeat violation, assess a charge of $200.00, and install a flow-restricting device of two gallons per minute (2 gpm) capacity for services up to one and one-half inch size (1.5"), and comparatively sized restrictors for larger service, on the customer's service where the violation occurred, for a period of not less than seventy-two hours.

e. **Fifth and Subsequent Violations.** The District shall provide the same notices and impose the same penalty measures as for a Fourth Violation and may, at the discretion of the General Manager of the District, discontinue water service to that customer at the premises at which the violation occurred.

Section 8: Appeal. Decisions made by the District under the regulations set forth in this Resolution may be appealed by customers in accordance with the procedures set forth in the District's Rules and Regulations.

Section 9: Severability. If any portion of this Resolution is found to be unconstitutional or invalid, the District hereby declares that it would have enacted the remainder of this Resolution regardless of the absence of any such valid part.

Section 10: Effective Date. This Resolution shall take effect June 27, 2016 and shall supersede Resolution No. 229.

BE IT FURTHER RESOLVED, that the Board of Directors find that the provisions of this Resolution are exempt from the provisions of the California Environmental Quality Act as an action to mitigate emergency conditions and as a rate setting measure pursuant to Public Resources Code §21080(b)(4) and (8);

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the La Puente Valley County Water District held on June 27, 2016.

Henry P. Hernandez
President of the Board

ATTEST:

Secretary

NOTICE OF PUBLIC HEARING

SUMMARY OF PROPOSED EMERGENCY WATER CONSERVATION RESTRICTIONS AND REGULATIONS ON WATER USAGE

La Puente Valley County Water District Resolution No. 240 Updating the Emergency Water Conservation Restrictions and Rescinding Resolution No. 229 June 27, 2016

On May 9, 2016, Governor Edmund G. Brown Jr. issued an executive Order No. B-37-16 directing actions aimed at using water wisely, reducing water waste, and improving water efficiency and directed the State Water Resources Control Board ("SWRCB") to adjust emergency water conservation regulations for urban water conservation in response to the changing water supply conditions across the state.

On May 18, 2016, the SWRCB adopted new emergency water conservation regulations which replaced the state-developed standards with locally developed water conservations standards based on each agency and urban water supplier's specific circumstances. A resolution adopting water conservation measures for the La Puente Valley County Water District that take into account the current regional water supply conditions is proposed to be adopted by the **District's Board of Directors at its regular board meeting on June 27, 2016 at 5:30 pm at 112 N. First St., La Puente, California 91744.**

A summary of the water conservation regulations is set forth below:

1. No ornamental landscape, lawn or other turf area may be watered with potable water more often than three (3) days per week (for the purposes of this regulation, a week shall be deemed to commence at 12:01 a.m. on Sunday morning and end at midnight on the following Saturday night) and is prohibited between the hours of 9 a.m. and 6 p.m.
2. No ornamental landscape, lawn or other turf area may be watered with potable water on a day with measurable rainfall (0.01 inches of rain or greater) or within 48 hours thereafter.
3. Parks and schools are prohibited from watering its athletic fields more often than four (4) days per week.
4. No watering with potable water of ornamental landscapes, lawns, or other turf on public street medians is permitted.
5. All watering of landscapes, lawns, or other turf outside of newly constructed homes and buildings must be done in a manner consistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
6. No water users may cause or allow the water to run off landscape areas into adjoining streets, sidewalks, or other paved areas due to incorrectly directed or maintained sprinklers or excessive watering.
7. The use or application of potable water to driveways, sidewalks, patios, parking

areas or other paved surfaces is prohibited.

8. Washing of motor vehicles, trailers, boats and other types of equipment must be done only with a hand-held nozzle or other device that causes the water hose to cease dispensing water immediately when not in use (except as to reclaimed wastewater or by a commercial car wash using recycled water).
9. No potable water may be used to clean, fill or maintain levels in decorative fountains, ponds, lakes or other similar aesthetic structures unless such water is part of a recirculating system.
10. All water users must promptly upon discovery repair all leaks from indoor and outdoor plumbing fixtures.
11. The use of water from fire hydrants is limited to fire fighting and related activities and other uses of water for municipal purposes is limited to activities necessary to maintain the public health, safety, and welfare.
12. Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily, and notice of this option must be prominently displayed in each guestroom using clear and easily understood language.

These regulations will be enforced by warnings and fines for repeat violations. The regulations shall take effect June 27, 2016 and shall remain in effect until otherwise repealed or amended by the Board of Directors of the La Puente Valley County Water District.

A complete copy of the proposed Resolution No. 240 is available for review at the District's office located at 112 N. First Street, La Puente, California 91744.

Rosa B. Ruehlman

Rosa B. Ruehlman
Board Secretary
La Puente Valley County Water District

PUBLISH: June 22, 2016

NOTICE OF ADOPTION
AND
SUMMARY OF MANDATORY EMERGENCY WATER CONSERVATION RESTRICTIONS AND REGULATIONS ON WATER USAGE

La Puente Valley County Water District Resolution No. 240
Updating the Emergency Water Conservation Restrictions

On June 27, 2016, the La Puente Valley County Water District ("District") adopted Resolution No. 240, Rescinding Resolution No. 229 and Updating the Emergency Water Conservation Restrictions of water for public use within the District's service area as mandated by the State Water Resources Control Board ("SWRCB").

A summary of the water conservation regulations is set forth below:

1. No ornamental landscape, lawn or other turf area may be watered with potable water more often than three (3) days per week (for the purposes of this regulation, a week shall be deemed to commence at 12:01 a.m. on Sunday morning and end at midnight on the following Saturday night) and is prohibited between the hours of 9 a.m. and 6 p.m.
2. No ornamental landscape, lawn or other turf area may be watered with potable water on a day with measurable rainfall (0.01 inches of rain or greater) or within 48 hours thereafter.
3. Parks and schools are prohibited from watering its athletic fields more often than four (4) days per week.
4. No watering with potable water of ornamental landscapes, lawns, or other turf on public street medians is permitted.
5. All watering of landscapes, lawns, or other turf outside of newly constructed homes and buildings must be done in a manner consistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
6. No water users may cause or allow the water to run off landscape areas into adjoining streets, sidewalks, or other paved areas due to incorrectly directed or maintained sprinklers or excessive watering.
7. The use or application of potable water to driveways, sidewalks, patios, parking areas or other paved surfaces is prohibited.
8. Washing of motor vehicles, trailers, boats and other types of equipment must be done only with a hand-held nozzle or other device that causes the water hose to cease dispensing water immediately when not in use (except as to reclaimed wastewater or by a commercial car wash using recycled water).
9. No potable water may be used to clean, fill or maintain levels in decorative fountains, ponds, lakes or other similar aesthetic structures unless such water is part of a recirculating system.
10. All water users must promptly upon discovery repair all leaks from indoor and outdoor plumbing fixtures.
11. The use of water from fire hydrants is limited to fire fighting and related activities

and other uses of water for municipal purposes is limited to activities necessary to maintain the public health, safety, and welfare.

12. Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily, and notice of this option must be prominently displayed in each guestroom using clear and easily understood language.

These regulations will be enforced by warnings and fines for repeat violations. The regulations shall remain in effect until otherwise directed by the SWRCB.

A certified copy of the entire Resolution No. 240 is available for review at the District's office located at 112 N. First Street, La Puente, California 91744.

Resolution No. 240 was adopted on June 27, 2016, by the following vote of the Board of Directors:

AYES: Directors; Escalera, Hernandez, Aguirre, Hastings & Rojas

NOES: None.

ABSENT: None.

ABSTAIN: None.

Rosa B. Ruehlman

Rosa Ruehlman
Board Secretary

PUBLISH:

Memo

To: Honorable Board of Directors

From: Greg B. Galindo, General Manager

Date: June 9, 2017

Re: MOU Regarding PWAG's Emergency Preparedness Coordinator Position.

Attached is the Memorandum of Understanding (MOU) regarding the Public Water Agencies Group (PWAG) Emergency Preparedness Coordinator Position.

At the upcoming Board meeting, Staff will provide a presentation about the MOU and information regarding the cost sharing for hiring an Emergency Preparedness Coordinator.

Respectfully Submitted,

Greg B. Galindo

General Manager

MEMORANDUM OF UNDERSTANDING
REGARDING PUBLIC WATER AGENCIES GROUP
EMERGENCY PREPAREDNESS COORDINATOR POSITION

This Memorandum of Understanding regarding Public Water Agencies Group Emergency Preparedness Coordinator Position ("MOU") is made, entered into and effective as of _____, 2017 (the "Effective Date"), by and among: Crescenta Valley Water District, Kinneloa Irrigation District, La Puente Valley County Water District, Palmdale Water District, Pico Water District, Quartz Hill Water District, Rowland Water District, San Gabriel County Water District, San Gabriel Valley Municipal Water District, South Montebello Irrigation District, Three Valleys Municipal Water District, Valley County Water District and Walnut Valley Water District (which entities may be referred to individually herein as a "Party" or collectively as the "Parties"), and Lagerlof, Senecal, Gosney & Kruse, LLP ("Legal Counsel" with respect to the following facts:

RECITALS

A. Each Party is a member of the Public Water Agencies Group ("PWAG" or the "Group"), an informal association of 17 public agency water suppliers located in Los Angeles County, California.

B. Over the past several years, the Group has been pursuing efforts to enhance the emergency preparedness of certain of the Parties who have elected to participate in those efforts.

C. Based on those prior efforts, the Group has determined that a need exists to engage a dedicated emergency preparedness coordinator (the "Coordinator"), to be employed through the Legal Counsel, to render training and coordination services, as more fully described in the job description set forth in Exhibit A hereto, to the Parties and to those entities who may subsequently elect to be added as Parties to this MOU.

D. The Parties therefore desire to set forth their respective obligations with respect to the engagement and compensation of the Coordinator, as set forth herein.

NOW, THEREFORE, the Parties agree as follows:

1. Cost Sharing Allocation. The Parties estimate that the salary, benefit burden, overhead and related administrative costs related to the engagement and compensation of the Coordinator (collectively, the "Coordinator Costs") will be up to $170,000.00 per year, with possible subsequent increases in salary based on step increases and/or cost of living adjustments to be approved by the Group's Emergency Preparedness Committee (the "Committee"). Each Party shall pay its share of the Coordinator Costs, as allocated among the Parties as set forth in Exhibit B hereto, to

Legal Counsel as specified herein and Legal Counsel shall thereafter pay all costs associated with Legal Counsel's employment of the Coordinator, based on Legal Counsel's employment practices, including salary, benefits and required employer contributions. The foregoing cost allocation is based on the number of service connections each Party has, as follows:

0-999 Service Connections – Very Small;
1,000 to 4,999 Service Connections – Small;
5,000 to 9,999 Service Connections – Medium;
10,000 to 19,999 Service Connections – Medium-Large;
Over 20,000 Service Connection – Large; and
Wholesale or replenishment water providers are classified as Medium.

2. Changes to Cost Allocation. In the event that a new Party is added to this MOU, Exhibit B shall be amended accordingly to proportionately reduce the required financial contributions of each of the previously existing Parties. Any such new Parties will be responsible for their respective share beginning the month following approval of their participation in this MOU, as specified in Section 6, below. Similarly, in the event a Party withdraws from this MOU, in the manner specified in Section 7, below, then Exhibit B shall be amended accordingly to proportionately increase the required financial contributions of each of the remaining Parties.

3. Payment of Costs. The Group's Legal Counsel shall invoice each Party by e-mail on a monthly basis, in advance, for that Party's share of the Coordinator Costs, as specified on Exhibit B. All payments are to be made payable to the "Lagerlof, Senecal, Gosney & Kruse, LLP Client Trust Account" and will be held in trust by Legal Counsel until paid to Legal Counsel's general account for payment to Coordinator or to Legal Counsel for overhead and administrative costs, as specified in Section 8, below. Each Party shall pay such costs within thirty (30) days of presentation of the monthly invoice from Legal Counsel. If payment is not received by Legal Counsel by the thirtieth (30^{th}) day after presentation of that invoice, the Legal Counsel shall notify the Party who has failed to pay of that failure and that Party shall then have five (5) days to pay its outstanding share of the Coordinator Costs to Legal Counsel. If that Party does not make that required payment within that five (5) day period, Legal Counsel shall then notify each of the other Parties of the need to make additional payments pursuant to Section 4, below.

4. Withdrawal of a Party or Party's Failure to Pay. Each Party acknowledges that if any Party fails to pay Coordinator Costs as specified herein or if a Party withdraws as specified in Section 7, below, the other Parties shall contribute additional funds to cover that failure to pay or the withdrawing Party's share of the Coordinator Costs. Legal Counsel shall promptly notify the Parties in either situation, and the Parties shall pay to the Legal Counsel within fourteen (14) days of receipt of notice from the Legal Counsel all sums required, as specified in that notice. The Parties may commence legal action to collect any unpaid amounts from a Party who fails to pay its share of the Coordinator Costs in accordance with this MOU.

5. Coordinator Hiring and Duties. The duties and obligations of the Coordinator are specified in the Job Description set forth in Exhibit A hereto. The Coordinator shall be engaged as an employee by Legal Counsel. Legal Counsel shall coordinate the Coordinator's duties with the Committee. The Committee shall oversee the recruitment and hiring of the Coordinator; provided that the hiring of the Coordinator, including the Coordinator's salary, must be approved by at least a majority of the Parties.

6. Additional Parties. Parties may be added to this MOU upon the approval of at least a majority of the then existing Parties. Upon the approval of any new Party by the existing Parties, Exhibit B shall be amended to reflect the revised cost allocation among the Parties as a result of that addition, based on the classification of that new Party as set forth in Section 1, above.

7. Term; Withdrawal of a Party. This MOU shall have an initial term of two (2) years from the Effective Date (the "Initial Term") and shall thereafter continue for consecutive two (2) year terms unless terminated by a majority of the Parties at least sixty (60) days, but not more than one hundred twenty (120) days, before the expiration of the then current term. The Parties acknowledge that this MOU is made possible by the commitment of each of the Parties and thus no Party may withdraw from this MOU during the Initial Term. In any subsequent term, a Party may withdraw from the MOU on at least four (4) months' written notice to the other Parties, and such withdrawing Party shall be responsible for paying its allocated share of the Coordinator Costs until that notice period has expired.

8. Coordinator Costs; Overhead and Administrative Costs. Legal Counsel agrees to timely pay all monies owed to the Coordinator, based on the salary and benefits approved by the Parties. In addition to those salary and benefit costs, which costs shall include any employer contributions required under applicable law, Legal Counsel shall be entitled to a seven percent (7%) fee, calculated on the salary and benefits to be provided to the Coordinator, for its overhead and administrative costs in employing the Coordinator. This fee is not related to any legal services to be provided by Legal Counsel and all such legal fees shall be separately invoiced to the Parties. Any Party may audit Legal Counsel's records with respect to payments made, and benefits provided, to the Coordinator upon at least forty-eight (48) hours' prior written notice.

9. Indemnification of Coordinator Costs. The Parties agree to indemnify the Group's Legal Counsel, as the Coordinator's employer, against, and hold the Group's Legal Counsel harmless from, any liability resulting from the payment of the Coordinator Costs, except to the extent that any such costs result from the Legal Counsel's negligence or willful misconduct.

10. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

11. Amendment. This Agreement may be modified only by a written agreement signed by the Parties.

12. Severability. If any court determines that any provision of this Agreement is invalid or unenforceable, any invalidity or unenforceability will affect only that provision and will not make any other provision of this Agreement invalid or unenforceable and such provision shall be modified, amended or limited only to the extent necessary to render it valid and enforceable**.**

13. Counterparts; Execution Transmitted by E-Mail or Fax. This Agreement may be executed in counterparts, effective as of the Effective Date first set forth above. The parties agree that this Agreement will be considered signed when the signature of a party is delivered by e-mail or by facsimile transmission. Such e-mailed or facsimile signature shall be treated in all respects as having the same effect of an original signature.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed and delivered as of the last date set forth below.

Crescenta Valley Water District

Dated:_____, 2017

By_____
Its_____

Kinneloa Irrigation District

Dated:_____, 2017

By_____
Its_____

La Puente Valley County Water District

Dated:_____, 2017

By_____
Its_____

Palmdale Water District

Dated:_____, 2017

By_____
Its_____

Pico Water District

Dated:_____, 2017

By_____
Its_____

Quartz Hill Water District

Dated:_____, 2017

By_____
Its_____

Rowland Water District

Dated:_____, 2017

By_____
Its_____

San Gabriel County Water District

Dated:_____, 2017

By_____
Its_____

San Gabriel Valley Municipal Water District

Dated:_____, 2017

By_____
Its_____

South Montebello Irrigation District

Dated:_____, 2017

By_____
Its_____

Three Valleys Municipal Water District

Dated:_____, 2017

By_____
Its_____

Valley County Water District

Dated:_____, 2017

By_____
Its_____

Walnut Valley Water District

Dated:_____, 2017

By_____
Its_____

Lagerlof, Senecal, Gosney & Kruse, LLP

Dated:_____, 2017

By_____
James D. Ciampa, Managing Partner

EXHIBIT A

PUBLIC WATER AGENCIES GROUP
EMERGENCY PREPAREDNESS COORDINATOR

[SUBJECT TO MODIFICATION]

JOB SUMMARY: Acts as a general and individual resource for the Public Water Agencies Group to:

- Document standard emergency response operating guidelines and operational checklists, and related training;
- Coordinate overall emergency planning activities;
- Conduct regular review and editing of participating agencies' emergency response plans;
- Manage and update participating agencies' emergency resource database, consisting of participating agencies' equipment and personnel that are available to other agencies in the event of an emergency;
- Employ standard emergency management concepts and strategic methodologies;
- Conduct disaster exercises in accordance with state and federal requirements, operates and tests Emergency Operations Center (EOC) equipment and systems, develops activation procedures, prepares checklists for positions in the Incident Command System for training programs and tabletop drills;
- Familiar with SEMS and NIMS procedures and functions and provide SEMS and NIMS training;
- Liaison with applicable federal, state and local emergency planning and response offices; staffs and serves on committees with other departments, agencies, commissions and emergency management groups; coordinates the other agencies concerned with emergency management;
- Work to enhance the visibility of the participating member agencies in county-wide emergency planning and management efforts, and to integrate water agencies into such planning activities
- Coordinate with participating agencies' Public Information Coordinators/Officers to establish communication channels with local mutual aid groups, emergency responders, hospitals, and local officials on agencies' response capabilities and plans in the event of an emergency;
- Confer with state and federal emergency management representatives in supporting participating agencies' emergency management activities; assures conformity of participating agencies' emergency management programs with federal and state requirements;
- Works in conjunction with the PWAG Group to promote awareness and to coordinate of emergency response plans and procedures;
- Provide requisite planning activity reports, budget submissions, and/or other required documentation for federal and state emergency response funding sources to ensure all necessary prerequisites to receiving federal and state emergency funding are met;
- Assist with development of operational drills and/or exercise scenarios among participating agencies and other public entities to train, test and evaluate emergency response concepts or standard operating guidelines;
- Adjust emergency plans, procedures or protocols to reflect any changes in federal, state, or local laws and improve efficiency as appropriate;
- Participate in related training programs as directed, completing courses, workshops, seminars, and other training to keep abreast of emergency planning issues and concepts;
- Perform other related duties as assigned; and
- Carry cellular phone, or other emergency communication devices during all work hours and at all other times when unavailable by phone at home (cellular phone costs to be included in salary).

KNOWLEDGE, SKILLS AND ABILITIES

Knowledge of the laws and regulations governing emergency management; Recommend and assist in the implementation of goals and objectives; establish schedules and methods for providing emergency preparedness services; implement policies and procedures. Knowledge of emergency and/or disaster planning principles and practices; Conducts/oversees disaster exercises in accordance with state and federal requirements, operates and tests Emergency Operations Center (EOC) equipment and systems, develops activation procedures, prepares checklists for positions in the Incident Command System for training programs and tabletop drills; activates sections of the emergency plan; Skill in organization and planning techniques; Ability to analyze information under emergency operating conditions and directing the course of action to be taken; Skill in public relations and public speaking; Skill in computer and communication equipment operation; Knowledge of basic budget development and fiscal management; Knowledge of public health; Ability to establish and maintain effective working relationships with other government officials, employees, agencies, volunteers, and the public; Ability to communicate effectively, verbally and in writing; Ability to learn the principles, practices and techniques involved in emergency management; and Knowledge of principles and practices of governmental and public health agency structures and resources.

SPECIAL REQUIREMENTS

Ability to travel throughout Los Angeles County and possible neighboring counties; mileage reimbursement at establish IRS rate to be provided. May be on-call twenty-four (24) hours a day, seven (7) days a week. The person filling this position must complete training courses as recommended.

EDUCATION AND EXPERIENCE

Equal to the ability and experience to get the job done

EXPERIENCE

At least three years of water agency management, and/or direct experience coordinating emergency services.

LICENSING AND CERTIFICATION

Not required for the position, but any professional certification or pertinent undergraduate or graduate specialized degree would be beneficial.

SALARY AND BENEFITS

Range of $85,000 to $105,000 per year, plus retirement benefits and health benefits to be negotiated. Step salary increases and/or cost of living adjustments to be considered.

EXPENSES

To be addressed in employment agreement

OFFICE SPACE

To be agreed upon with applicant. Office equipment and support to be provided by PWAG Legal Counsel, as needed.

REPORT TO:

Public Water Agencies Group Emergency Preparedness Committee, with direct reporting to PWAG Legal Counsel.

2017 WATER MASTER PLAN

FOR

CITY OF INDUSTRY WATERWORKS SYSTEM

Prepared By:

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

Submitted: June 2017

EXECUTIVE SUMMARY

The City of Industry is contracted with La Puente Valley County Water District (LPVCWD) to maintain, operate and monitor the City of Industry Waterworks System (CIWS). The CIWS owns and operates a water supply and distribution system that serves portions of the City of Industry and an unincorporated area of Los Angeles County (Avocado Heights). CIWS's objective 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 the CIWS 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 LPVCWD recognizes that identifying requisite improvement projects and managing costs is essential to the CIWS. With that being said, the WMP shall be utilized by the CIWS to prepare and complete selected projects identified therein, which shall be independently approved by the Industry Public Utilities Commission (IPUC). The WMP will also be utilized by the CIWS to support a cost of service analysis, which will serve as the basis for water rates moving forward.

2017 WATER MASTER PLAN

The WMP addresses and evaluates the CIWS system through various chapters as listed below:

- **Chapter 1: Introduction** – Provides a general overview of the CIWS 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 the CIWS
- **Chapter 3**: **Sources of Supply** – Summary of sources and alternative sources at the CIWS
- **Chapter 4**: **Water Quality** – Status and potential impacts of water quality on the CIWS 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 CIWS's water system
- **Chapter 7**: **Water Conservation Programs** – Provides guidance for the implementation of water conservation programs in line with CIWS'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, CIWS'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 CIWS's historic number of service connections. However, according to the Southern California Association of Governments (SCAG), by 2020, the population in the unincorporated areas of Los Angeles County is expected to increase by 10%. The projected average rate of increase of water demand over the next 20 years is approximately 21.6%.
- **Water Quality** – Water from the CIWS Well 5 (contaminated with Perchlorate) is treated at San Gabriel Valley Water Company's (SGVWC) B5 Treatment Plant. Plant B5 has treatment facilities to remove volatile organic compounds (VOC), Perchlorate, NDMA, and 1,4-dioxane. Concentrations of VOCs and Nitrate at Well 5 are currently below the respective MCLs and concentrations of NDMA and 1,4-dioxane are currently non-detect.

  Based on the most recent water quality sampling conducted in the last 10 years, water from CIWS's Well 3 and 4 is contaminated with TCE and NDMA above respective MCLs. Acknowledging that SGVWC's Plant B5 can remove TCE and NDMA, water from both Wells can potentially be treated at plant B5. Within the planning period, it is recommended that these Wells be sampled to adequately characterize the current water quality.
- **Water Conservation** – To reduce the reliance of imported water supplies, the top 5 potential water use reduction projects for consideration at the CIWS 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, CIWS's source of supply has a surplus under primary supply design criteria (largest source out of service) and over a 6,000 gpm surplus under secondary supply design criteria (with all sources available, including interconnections).
- **Storage Facilities** – The CIWS 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, all pump stations were able to achieve its dependent MDD requirement with fire flow along with PHD's.
- **Distribution System** - The primary function of a distribution system is to carry supply to where it is needed. The hydraulic model analysis proved that less than 1% of fire hydrants were not able to meet current fire code supply demand. However, it should be noted that the identified hydrants (<1%) that did not meet current fire standards were constructed approximately during the 1950's and 1960's under a different fire code requirement.

After assessing the distribution system, 73% of the system's waterlines will reach maturity in 17 years. It is recommended that the CIWS consider a pipe replacement programs that starts at 0 in 2016 and increases by 780 feet per year until 2034.

Acknowledging the aforementioned and the recommended improvements identified in the WMP, in the next 10 years, CIWS's capital improvement project cost are estimated at $2.9 million dollars and roughly $1.7 million dollars for maintenance projects.

FIGURES

TABLES

CHAPTER ONE – INTRODUCTION

1.1 General Description

The Water Master Plan (WMP) is a stand-alone living document intended to provide comprehensive analysis of the City of Industry Waterworks System (CIWS). Any recommendations for capital improvements are made from the perspective of the historical data available and at the time of the WMP's preparation. The City of Industry (COI) has contracted with La Puente Valley County Water District (LPVCWD) to maintain, operate and monitor the CIWS and service to its customer.

1.2 Study Area

COI is in eastern Los Angeles County, within the East San Gabriel Valley region, near the junction of Orange and Riverside counties. COI is surrounded by portions of unincorporated Los Angeles County (including Valinda and South San Jose Hills) and the cities of La Puente, Baldwin Park, West Covina, and Walnut to the north; the cities of Pomona and Diamond Bar to the east; unincorporated portions of Los Angeles County (including Hacienda Heights and Rowland Heights) to the south; and portions of unincorporated Los Angeles County (including Bassett and Avocado Heights), and the cities of Pico Rivera and El Monte to the west.

1.3 Study Period

Historical data for the seven-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 CIWS as well as land use data from the Los Angeles County Department of Regional Planning in order to determine the planners' vision for development within the CIWS 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 regarding those parcels served by CIWS. 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 how demand changes with time and the extent of water loss 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, 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 deal 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 the CIWS 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 American Water Works Association (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 **Appendix D**.

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).

- *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

[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*.

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 CIWS 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.
- ***Civiltec*** reviewed and included the project description of the Puente Basin Operable Unit (PBOU) in the supply portfolio of CIWS. Modeling of specific elements of transport and conveyance of PBOU supply to the system will be directed by LPVCWD to achieve the specific needs of the PBOU. The specific criteria for transport and simulations will be established and scoped outside this effort.

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 CIWS 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 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 impacts 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 CIWS operations, facilities or policies. ***Civiltec*** identified and described those legislative and regulatory initiatives that may impact CIWS.

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 CIWS 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*** will present the CIP in tabular form by type in accordance with CIWS preferences for organization and budgeting.

1.4.10 Water Conservation

Water Conservation Goal Review

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

1.5 Abbreviations

The following abbreviation appear in this report:

AC	Asbestos-Cement
ADD	Average Day Demand
AFY	Acre-Feet per Year
AF	Acre-Foot
AWWA	American Water Works Association
BPOU	Puente Basin Operable Unit
CCR	Consumer Confidence Reports
CF	Cubic Foot
CFS	Cubic Foot per Second
CII	Commercial, industrial and institutional areas
CIP	Capital Improvement Program
CIWS	City of Industry Waterworks Systems
COI	City of Industry
CUWCC	California Urban Water Conservation Council
DDW	Division of Drinking Water
DEM	Digital Elevation Model
EDC	Endocrine Disrupting Compounds
EPA	US Environmental Protection Agency
ETo	Evapotranspiration
GIS	Geographic Information System
GPM	Gallons Per Minute
GRRP	Groundwater Replenishment Reuse Project
HWL	High Water Line
IPU	Industry Public Utilities
L	Liter
lbs	Pounds
LPVCWD	La Puente Valley County Water District
LWL	Low Water Line
MCL	Maximum Contaminants Level
MDD	Maximum Day Demand
MDD+FF	Maximum Day Demand plus Fire Flow
MGD	Millions of Gallons per Day
MG	Milligram
mg/l	Milligrams per Liter
Min Day	Minimum Day Demand
MSGB	Main San Gabriel Basin

MTBE	Methyl Tertiary Butyl Ether
MWD	Metropolitan Water District
NDMA	N-Nitrosodimethylamine
OAL	Office of Administrative Law
OSY	Operating Safe Yield
OU	Operable Units
PBOU	Puente Basin Operable Unit
PD	Planned Development
PCE	Perchloroethylene
PF	Peaking Factor
PHD	Peak Hour Demand
PPB	Parts Per Billion
PPM	Parts Per Million
PVC	Polyvinyl Chloride
ROD	Record of Decision
RWD	Rowland Water District
SCADA	Supervisory Control and Data Acquisition
SCAG	Southern California Association of Government
SCE	Southern California Edison
SDWA	Safe Drinking Water Act
SGVWC	San Gabriel Valley Water Company
SWS	Suburban Water Systems
TCE	Tetrachloroethylene
TDH	Total Dynamic Head
TVMWD	Three Valleys Municipal Water District
ULF	Ultra Low Flush
USEPA	United States Environmental Protection Agency
USGVMWD	Upper San Gabriel Valley Municipal Water District
UWMP	Urban Water Master Plan
VFD	variable frequency drive
VOC	volatile organic compounds
Water Model	Hydraulic Computer Model
WMP	Water Master Plan
WVWD	Walnut Valley Water District
µg/l	Micrograms per Liter

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 appurtenance. 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 and the CIWS management and staff. In particular, the efforts of the following individuals proved to be invaluable:

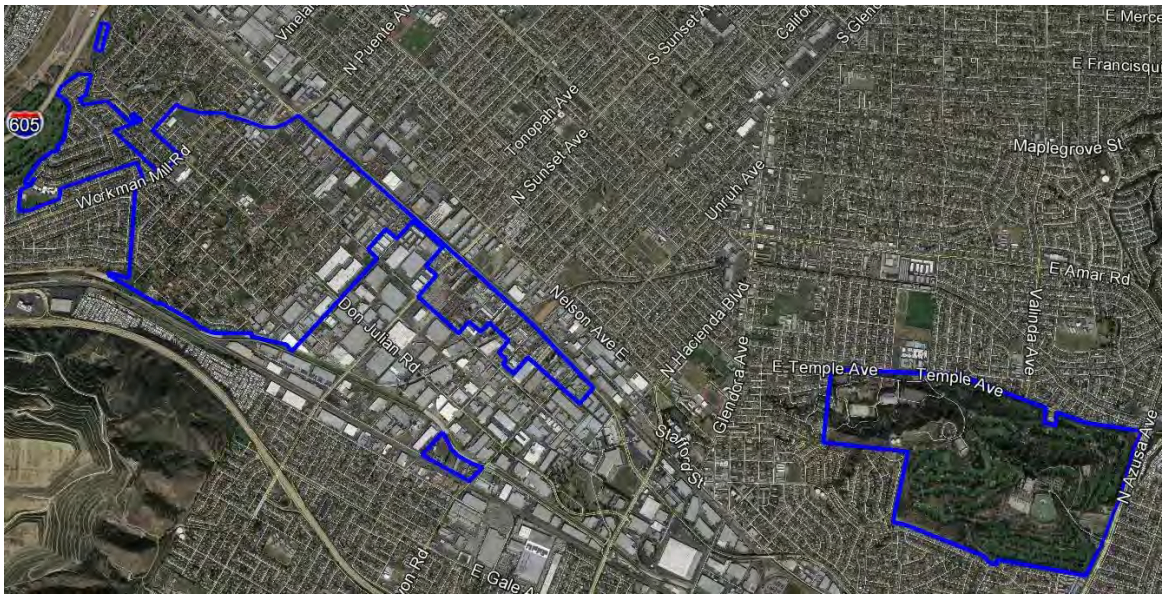
- Paul Phillips – City Manager
- Greg Galindo – LPVCWD General Manager
- Roy Frausto – LPVCWD Compliance Officer/Project Engineer
- Cesar Ortiz – LPVCWD Production & Treatment Supervisor

CHAPTER TWO- WATER REQUIREMENTS

2.1 General Description

The purpose of Chapter 2 is to lay out the context for Land Use planning as it influences CIWS. The COI is served by six different agencies as follows: San Gabriel Valley Water Company (SGVWC), CIWS, LPVCWD, Suburban Water Systems (SWS), Rowland Water District (RWD) and Walnut Valley Water District (WVWD). The CIWS boundaries are shown in **Figure 2-1**. The CIWS serves a small area within the COI and primarily serves unincorporated County areas adjacent to the COI boundaries.

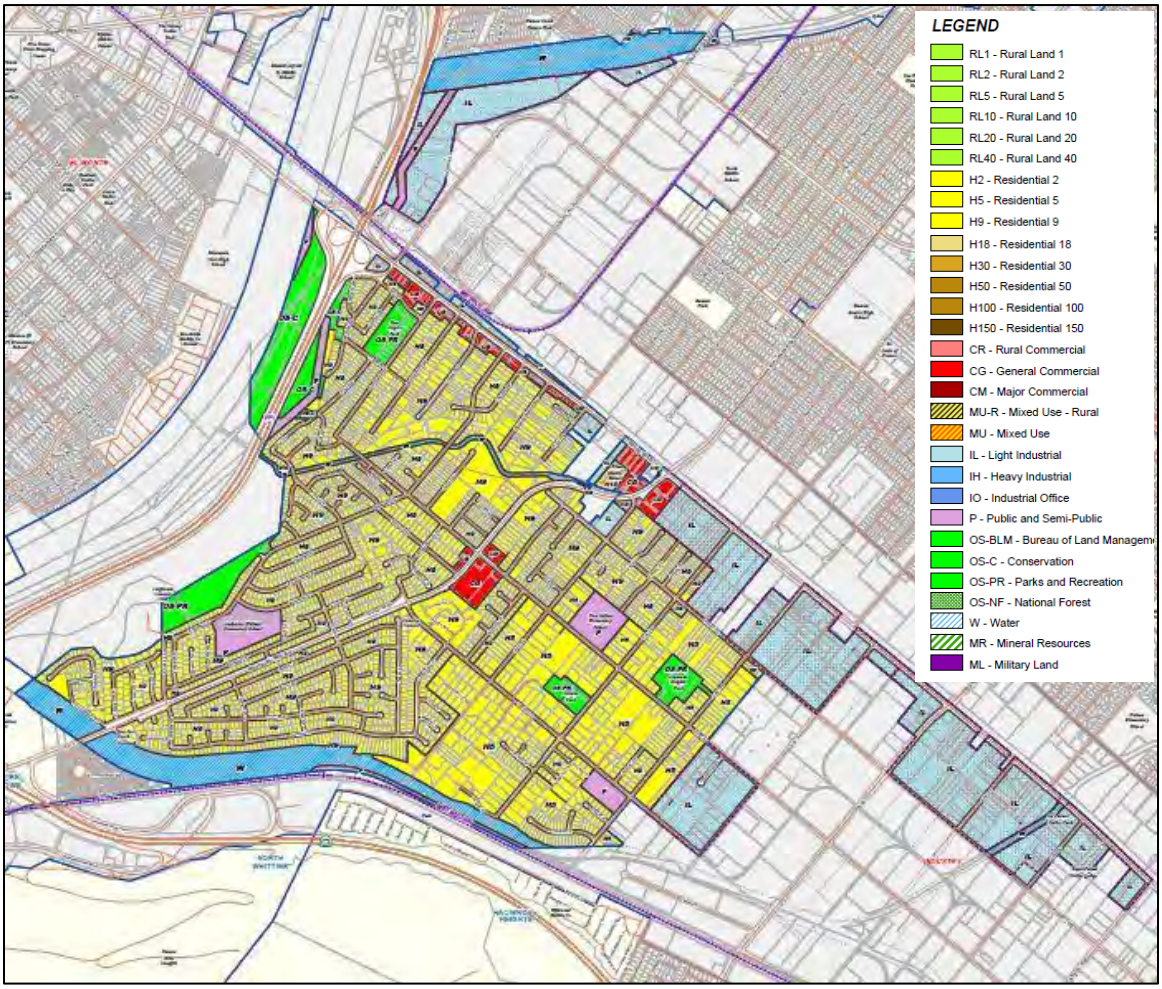
Figure 2-1 – CIWS Service Boundary



2.2 Land Use Analysis

The unincorporated portions of Los Angeles County being served by CIWS is Avocado Heights. Avocado Heights encompasses approximately 1,598.5 acres (2.5 sq.-mi) composed primarily of residential use (15,411 in 2010) with limited commercial and industrial use around its periphery. The current land use map shown in **Figure 2-2** displays color coded land use for Residential (70% - yellow), Commercial (2% - red), Industrial (12% - light blue), Recreation and Open Space (6% - pink) and water (10% - blue). The service area in the CIWS is believed to be at full build out. Therefore, minimal growth is projected.

Figure 2-2 – Avocado Heights Land Use Map



2.3 Pending Development

As of early 2017, no proposed developments have been submitted to the CIWS for review. In addition, the COI's planning division confirmed that there were no pending developments within the CIWS's service area and the Los Angeles County of Public Works also confirmed that no planned developments were identified in Avocado Heights. However, it should be noted that several properties in the Avocado Heights area consist of 1 acre (or greater) lot sizes. In the event that the County approves subdivision of lots, small residential housing units could be developed.

2.4 Water Demand Analysis

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, street cleaning water, and so on. Water losses also

include other forms of unaccounted water such as leaks, reconciliation of inaccurate meters, unauthorized uses, pipe breaks, undocumented maintenance, and so on.

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 to 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.

CIWS provides potable water to approximately 7,000 people through 1,936 service connections within the city itself and in adjacent unincorporated areas of Los Angeles County (1,504 General and Residential, 412 Commercial, 18 Irrigation and 2 Industrial).

2.4.1 Current Water Demand

From 2010 to 2016, the average water usage was approximately 1,351 AFY. For the years 2010 through 2016, the annual water use data, as provided by CIWS, are shown in **Table 2-1**.

Table 2-1 – Current Water Demand

Year	Water Use (AFY)	Water Use (gpm)
2010	1,382.21	856.35
2011	1,321.04	818.45
2012	1,401.54	868.32
2013	1,352.56	837.98
2014	1,296.64	803.33
2015	1,313.63	813.86
2016	1,392.38	862.40
Average	1,351.43	837.24

2.4.2 Steady State Peaking Factors

For planning purposes, there are three steady state conditions of interest: (1) ADD, (2) MDD and (3) PHD. The values of these peaking factors are calculated in the following chapters of the WMP.

Calculation of Average Day Demand (ADD)

Utilizing the procedures for determining ADD as outlined by the California Regulations Related to Drinking Water, §64454 (b) (3), the ADD between 2010 and 2016 was 3.70 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 with water use data provided by CIWS between 2010 through 2016. The highest MDD was 10.45 AF on June 21, 2013 and the average MDD of these years (2010 to 2016) is 8.8 AF. A peaking factor is the ratio of the MDD to ADD (2.41).

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 (largest zone) of the CIWS, the standard peaking factor of 2.41 can be considered adequate for planning purposes.

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.

A peaking factor is the ratio of the target demand to ADD (3.61). Peaking factors were derived by analyzing data to develop and 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. CIWS has a small resident population with the majority of water use in the city is served to industrial and commercial uses by other water suppliers. CIWS is considered built-out and no growth is projected.[1] However, most of the area which are provided water supply by CIWS are in unincorporated LA county areas[2]. According to a report of the LA County general plan, the projection of population is described as follows:

"According to SCAG, by 2020, the population in the unincorporated areas is expected to increase by 10%. SCAG prepares seasonal studies to project population growth and other indicators for the Southern California region. SCAG completes these short-term projections for use in housing elements and other planning initiates".

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	1.20	837	1.00
Maximum Daily Demand	MDD	2.89	2,006	2.41
Peak Hour Demand	PHD	4.33	3,009	3.61

[1] Final Municipal Service Review by Dudek and Associates, Inc. June 2005.
[2] Los Angeles County Housing Element, 2014-2021

2.4.3 Future Water Demand

Over the 20 years prior to 2014, the rate of population increase was approximately 1% per year in the unincorporated areas of LA County. This growth rate is based on the similar growth rates identified in the CIWS's historic number of service connections and the projected long-term growth rate. 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	1,345	837	2,006
2020	1,412	875	2,106
2025	1,483	918	2,212
2030	1,557	964	2,322
2035	1,635	1,013	2,438
Increase	290	180	432
% Increase	21.6 %		

CIWS is composed of 2 different water pressure zones. The future ADD water use in AFY by each pressure zone will be utilized for future urban planning, infrastructure improvement, facility improvement and so on. The future water use within CIWS's pressure zones over the next 20 years is shown in **Table 2-4**

In addition, future ADD and MDD water use presented as gpm within CIWS's pressure zones over the next 20 years is shown in **Table 2-5.**

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

Year	Zone 1[3]	Industry Hills[4]	Total
2015	1,143	202	1,345
2020	1,200	212	1,412
2025	1,260	223	1,483
2030	1,323	234	1,557
2035	1,389	246	1,635

[3] Zone 1 includes Salt Lake Zone
[4] Industry Hills includes Lake Loop and Pump Station 2 Pressure Zone

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

Scenario	Zone 1	Industry Hills	Total
2015			
ADD	711	126	**837**
MDD	1,704	302	**2,006**
2020			
ADD	743	132	**875**
MDD	1,790	316	**2,106**
2025			
ADD	780	138	**918**
MDD	1,880	332	**2,212**
2030			
ADD	820	144	**964**
MDD	1,973	349	**2,322**
2035			
ADD	861	152	**1,013**
MDD	2,072	366	**2,438**

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

Table 2-6 – Water Usage Percentage of Each Zone

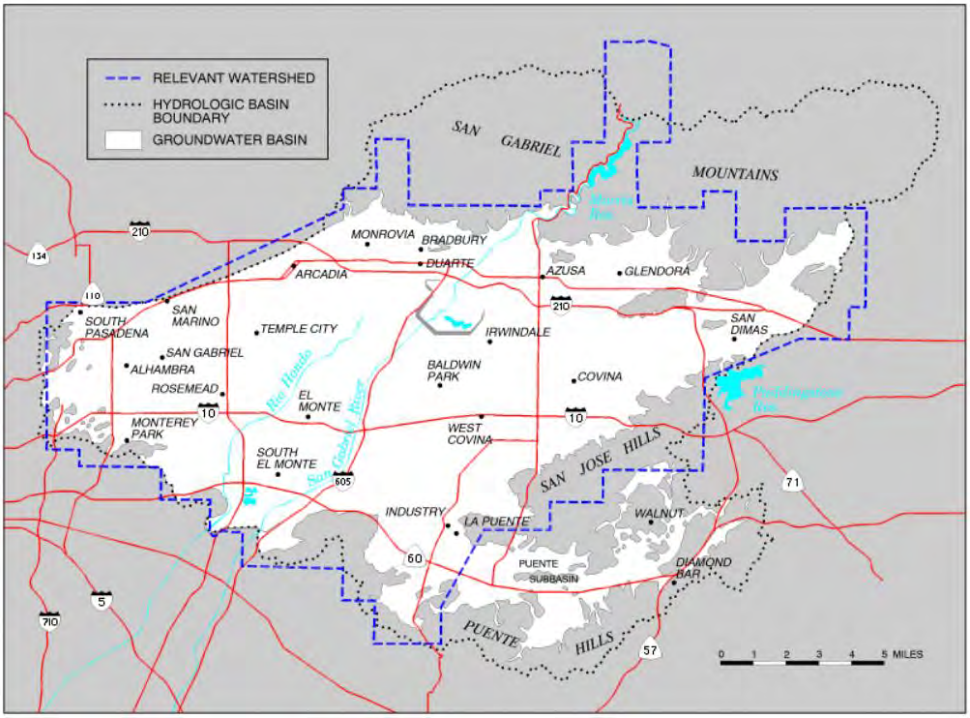
Zone 1	Industry Hills	Total
85%	15%	100%

CHAPTER THREE - SOURCES OF SUPPLY

3.1 General Description

The CIWS source of supply comes from one groundwater Well that produces water from the adjudicated Main San Gabriel Basin (MSGB). The MSGB 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



CIWS covers the Industry Hills Recreation Center, Golf Course and additional disconnected portions in western Industry. CIWS infrastructure system is operated and managed by LPVCWD, and includes the following:

- 31.9 miles of pipeline
- 7.5 million gallons of reservoir storage

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

- 2 pressure zones and 3 subzones
- 12 booster pumps
- 5 Wells

3.2 Water Source

The CIWS owns five groundwater Wells located at the San Fidel Wells Yard, however only one Well (No. 5) is active.

Well No. 1 has been abandoned.

Well No. 2 was placed on inactive status due to low production. The electrical power was disconnected and the Well is planned to be destroyed. Currently, this Well is being used as a monitoring Well for groundwater quality in the San Gabriel Basin.

Well No. 3 was drilled to a depth of 800 feet in 1980, and has a 20-inch diameter casing. The water produced by this Well has tetrachloroethylene (TCE), 1,2-DCA, and N-Nitrosodimethylamine (NDMA) exceeding their respective MCL and AL. Although Well No. 3 is on standby operational status, due to the source water contamination and waste water discharge limitations, CIWS cannot test this standby Well. For this reason, Well No. 3 is designated and placed as an inactive status.

Well No 4 was drilled to a depth of 1,000 feet in 1984 and has a 20-inch diameter casing. Based on the most recent water quality sampling, the water produced by this Well has TCE, 1,2-DCA, and NDMA exceeding their respective MCL and AL. Similar to the discharge limitations of Well 3, Well No 4 is also on standby operational status but is designated as an inactive Well.

Well No 5 is located 50 feet north of Well No 4 in the same yard and was drilled to a depth of 980 feet in 1984. Well No 5 also has 20-inch diameter casing. Well No 5 pumps into a dedicated transmission line than runs from the CIWS's Well field to SGVWC's B-5 treatment facility.

3.2.1 Alternative Sources

CIWS receives water from SGVWC's distribution system and maintains 7 interconnections with surrounding water purveyors out of which the CIWS actively receives water from 4 connections, however the CIWS currently receives nearly all of its potable water supply through the interconnection with SGVWC located at the Lomitas Reservoir. The other interconnections provide either emergency backup supply or supplemental supply to the CIWS. The CIWS also provides surrounding purveyors with either emergency backup supply or supplemental supply. These interconnections are not listed below.

Table 3-1 lists the locations and known capacities of the interconnections to CIWS. When CIWS' current water supply from SGVWC is unavailable, CIWS can receive water from adjacent water purveyors via the interconnections.

Table 3-1 – CIWS Potable Water Interconnection

Connection	From - To	Type	Size	Zone Served	Capacity (gpm)	Status
La Puente Valley County Water District Industry Hills Pkwy Pump Station 3	LPVCWD – Industry Hills (Upper Zone)	Groundwater	12"	Industry Hills	1,200	Emergency
La Puente Valley County Water District Valley Blvd. & Proctor Ave.	LPVCWD – CIWS Zone 1	Groundwater	14"	CIWS Z1	2,000	Emergency
La Puente Valley County Water District Industry Hills Pkwy Pump Station 1 – Hill St.	LPVCWD – CIWS Zone 1	Groundwater	16"	CIWS Z1	2,000	Emergency
La Puente Valley County Water District Industry Hills Reservoir	LPVCWD – Industry Hills (Upper Zone)	Groundwater	8"	Industry Hills	2,000 to LPVCWD 400 to CIWS	Active (Bi-Directional)
San Gabriel Valley Water Co. Salt Lake	SGVWC – CIWS Zone 1	Groundwater	2"	CIWS Z1	50	Active
San Gabriel Valley Water Co. Lomitas Reservoir	SGVWC – CIWS Zone 1	Groundwater	12"	CIWS Z1	2,000	Active
San Gabriel Valley Water Co. Workman Mill Road	SGVWC – CIWS Zone 1	Groundwater	10"	CIWS Z1	2,000	Active

Although water produced from Well 5 is about 1,200 gpm, CIWS can receive up to 4,050 gpm from SGVWC from three interconnections. The smallest connection between CIWS and SGVWC is the 2-inch located at Salt Lake Avenue near the Turnbull Canyon Road. The CIWS has 4 interconnections (connection size ranges from 8" to 16") with LPVCWD, three (3) located in the Industry Hills Area and one (1) located in Zone 1 on the intersection of Valley Blvd. and Proctor Avenue.

3.3 Water Rights

According to the CIWS's 2009 Master Plan, the CIWS was adjudicated 1,103.00 acre-feet of water rights based on groundwater production that occurred between calendar years 1953 and 1967, inclusive. The history MSGB water rights is addressed in the MSGB Watermaster Annual Reports. CIWS's total adjudicated water rights of 1,103.00 acre-feet represents 0.55810 percent of all adjudicated water rights in the Basin.

Under the MSGB Judgment, the Watermaster annually establishes an Operating Safe Yield (OSY) for the ensuing year. This is done mainly on the basis of groundwater storage conditions as reflected by the Baldwin Park Key Well. In order to provide sufficient storage capacity in the basin to capture as much of the local stream flow as practicable, the Judgment provides that imported supplemental water will be spread, insofar practicable, to maintain the elevation above 200 feet msl.

The groundwater rights in the basin were adjudicated on the basis of mutual prescription resulting in a specific quantity in acre-feet per year for each producer. Such rights were then converted to a Pumper's Share, expressed in percent of the aggregate of all prescriptive rights.

Each year the producer is allowed to extract, free of Replacement Water Assessment its share of the OSY which is established in May each year by the Watermaster. Any producer can extract all the water needed for beneficial use, but the portion of such extraction which exceeds the producer's share of OSY is assessed at a rate (Replacement Water Assessment) which will purchase one acre-foot of imported supplemental water for each acre-foot of excess production. Such water is then purchased by the Watermaster for the appropriate Responsible Agency (municipal water district) and used to replenish the basin.

If basin storage is low, as indicated by the Key Well elevation, OSY is set at a lower level so that more Replacement Water may be purchased to increase basin storage. If basin storage is relatively high, OSY is increased so that Replacement Water will not increase basin storage to the point that local water runoff will be un-storable.

A summary of CIWS's water rights, annual production, and replacement water requirements for the past 23 years is shown on **Table 3-2**.

Table 3-2 – History of Water Rights, Production, and Replacement Water (AF)

Fiscal Year	Pumping and Carryover Right	Leases	Total Production Right	Production	Replacement Water	Lost Carry Over	Carryover to Following Year
1992-93	1,005	0	1,005	1,527	522	0	0
1993-94	1,228	0	1,228	1,536	308	0	0
1994-95	1,116	0	1,116	1,567	451	0	0
1995-96	1,228	0	1,228	1,563	335	0	0
1996-97	1,172	0	1,172	1,676	504	0	0
1997-98	1,228	1,258	2,486	2,515	28	0	0
1998-99	1,284	1,314	2,598	2,542	0	0	55
1999-00	1,283	680	1,963	2,297	334	0	0
2000-01	1,228	0	1,228	1,501	273	0	0
2001-02	1,172	0	1,172	863	0	0	309
2002-03	1,369	-1,369	0	12	12	0	0
2003-04	949	-949	0	7	7	0	0
2004-05	949	-949	0	0	0	0	0
2005-06	1,339	-1,339	0	0	0	0	0
2006-07	1,339	-1,339	0	83	0	0	0
2007-08	1,172	0	1,172	9	0	0	1,163
2008-09	2,168	-1,163	1,005	2	0	0	1,003
2009-10	1,952	200	2,152	1,286	0	0	866
2010-11	1,815	350	2,165	1,395	0	0	770
2011-12	1,942	0	1,942	1,348	0	0	594
2012-13	2,011	300	2,311	1,352	0	0	658
2013-14	2,013	350	2,363	1,564	0	0	449
2014-15	1,786	500	2,286	1,386	0	0	399

3.4 Water Reliability, Sustainability, Availability

The MSGB is managed by the Watermaster and is the primary source of supply to CIWS through its operation of Well No. 5 and its connection with the SGVWC. Ultimately the MSGB provides a reliable source of supply to CIWS and its neighboring water agencies. During the period of management under the Judgment, significant drought events have occurred. In each drought cycle the Main Basin has been managed to maintain water levels. Therefore, based on historical and on-

going management practices, CIWS will be able to rely on the MSGB for adequate supply over the planning period under single year and multiple year droughts.

Historical data indicates the MSGB has been well managed for the full period of the adjudications, resulting in a stable and reliable water supply. There are no contemplated basin management changes, other than increasing direct use of recycled water for non-potable purposes and the planned use of recycled water for groundwater replenishment in the MSGB to reduce the need to import water from other regions. Therefore, the groundwater supplies in the MSGB are deemed reliable.

3.5 Supply to Pressure Zones

CIWS maintains two pressure zones and three pressure subzones as shown in **Figure 3-2**. CIWS Pressure Zone 1 includes Zone 1 and the Salt Lake Pressure Zone while Industry Hills contains the Lake Loop Pressure Zone, Pump Station 2 Pressure Zone (Industry Hills Lower) and the Industry Hills (Upper Zone).

Table 3-3 below summaries the basic features of the two zones.

Table 3-3 Ground Elevation Range of Pressur Zones

ZONE	Ground Elevation Range (Ft above MSL)		Operating Pressure Range (psi)	
	Low	High	Low	High
1	273	420	25	95
Industry Hills Zone (Lower)	420	620	35	80
Industry Hills Zone (Upper)	530	744	25	115

Pressure Zone 1 is served (water received from the Lomitas interconnection from SGVWC) from the 2.5 million gallon Lomitas Reservoir and Lomitas Booster Pump Station. Industry Hills Lower and Industry Hills Upper receive water from Zone 1 via a transmission main from Valley Boulevard to Temple Avenue via N. Hudson, Nelson and Glendora Avenues. Industry Hills Lower Zone is served by Industry Hills Pump Station 1 located at the west side of the Industry Hills Area near the cross section of Hill St and Del Valle Avenue. The water consumed in the Industry Hills Zone is measured by two meters located at Industry Hills Pump Station No. 1.

Industry Hills Upper Zone receives water from the Industry Hills Lower Zone. Pressure for this is provided by the Industry Hills Booster Pump Station No. 2, which also lifts water to Industry Hills East and West Reservoirs. These two reservoirs are located in Industry Hills which is an elevated section of the CIWS. Water can be supplied from these two reservoirs to CIWS customers

via gravity. Industry Hills Pump Station No. 3 is currently inactive, but can provide water and pressure to the Industry Hills Upper Zone with supply from an existing interconnection from LPVCWD.

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.

Figure 3-2 – CIWS Pressure Zone Map

CHAPTER FOUR - WATER QUALITY

4.1 General Description

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

The United States Environmental Protection Agency (EPA) and the 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.

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

In addition, the MSGB Watermaster, who manages the groundwater basin where CIWS 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 Industry Public Utility 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 A**.

4.3 Safe Drinking Water Act

The federal government, with the passage of the SDWA in 1974, 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 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 CIWS.

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 CIWS 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, CIWS

[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.

utilizes electronic communication of water quality reports. California water purveyors are currently able to electronically submit the CCR as of 2013.

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 methyl tertiary-butyl ether (MTBE). 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 CIWS groundwater, CIWS may become responsible for its cleanup. It is recommended CIWS 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 CIWS is unknown at this time. It is recommended CIWS monitor legislation regarding potential development of MCLs for EDCs.

4.4.6 Groundwater Replenishment Reuse

DDW has 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.

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. Based on the current availability of recycled water, the probability of the project moving forward is unlikely.

MWD, under partnership with the Sanitation Districts of Los Angeles, is 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 CIWS supply with recharge extending to the MSGB.

4.5 Local Contamination

There are concentrated areas of groundwater contamination in the MSGB. Some of the more severely contaminated areas are currently being cleaned up as Superfund sites administered by EPA. The San Gabriel Valley Superfund Site includes areas of soil and groundwater contamination that underlie portions of several cities. Superfund Sites have been divided into four operable units (OU). The CIWS comprises a portion of or the majority of area 1, 2 and 4.

Water from the CIWS Well 5 is currently contaminated with Perchlorate. Concentrations of Perchlorate have fluctuated between 4 ug/L and 11 ug/L. Water from the CIWS Well 5 is treated at SGVWC's Plant B5 treatment plant. Plant B5 has treatment facilities to remove volatile organic compounds (VOC), Perchlorate, NDMA, and 1,4-dioxane. Concentrations of VOCs and Nitrate at Well 5 are currently below the respective MCLs. In addition, concentrations of NDMA and 1,4-dioxane are currently non-detect.

The concentration trend (2013 to 2016) and average raw water contaminant concentration levels with their respective MCL's for Well 5 are listed in **Table 4-1.**

Table 4-1 – Average Water Quality for Well 5

Contaminants	Trend (2013-2016)	2016 Average Levels (ug/L)	MCL/NL
TCE	Constant	3.1	5 µg/L
PCE	Slight Increase	8.8	5 µg/L
Perchlorate	Decreasing	2.6	6 µg/L
Nitrate (as N)	Constant	6.2 mg/L	10 mg/L
1,1 DCE	Constant	1.8	6 µg/L
1,4-Dioxane	Constant	Non-Detect	*1 µg/L

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

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

The CIWS Wells 3 and 4 are currently inactive due to water quality contamination. However, water from these Wells might potentially be used in a future case of failure of Well 5 and/or additional water production requirements. Water from Well 3 is currently contaminated with TCE and NDMA above respective MCLs. Although SGVWC's Plant B5 can remove TCE and NDMA, the NDMA concentrations at Well 3 are significantly higher. Water from Well 4 is currently contaminated with Perchlorate above the MCL. The Perchlorate levels at Well 4 could potentially be removed at Plant B5.

Within the planning period, it is recommended that these Wells be sampled to adequately characterize the current water quality.

Area 1 Operable Unit

This area consists of El Monte, South El Monte and Whittier narrows OUs. CIWS encompasses a small portion of the east side of the Whittier narrows OU.

VOCs are the primary groundwater contaminants found above state and federal drinking water standards in the Whittier Narrows OU. More specifically, chlorinated solvents, including perchloroethylene (PCE) and TCE, are the primary VOCs that have been detected in excess of state and federal drinking water standards. Other VOCs in excess of drinking water standards have also sporadically been detected.

Elevated VOC contamination primarily occurs in the western half of the Whittier Narrows OU and mainly consists of PCE. The highest PCE concentrations are found in the shallow groundwater (up to 100 feet below ground surface), but exceedances of drinking water standards for both of PCE and TCE have been detected up to 400 feet below ground surface in western Whittier Narrows.

In 1999, EPA issued an amendment to the Record of Decision (ROD) for the Whittier Narrows OU, which identified the need for a groundwater extraction barrier approximately one-quarter mile north of the Whittier Narrows Dam to halt the flow of contamination traveling toward the Central Basin. To form an effective containment barrier, five or six extraction sites were constructed to remove and treat contaminated groundwater from both the shallow and intermediate zone aquifers. In 2002, EPA finished construction of the comprehensive cleanup facility and it is currently being operated by the City of Whittier.

Area 2 Operable Unit

This area consists of the Baldwin Park Operable Unit (BPOU). The BPOU extends through the cities of Azusa, Irwindale, Baldwin Park, West Covina, and COI.

Carbon tetrachloride, PCE, and TCE are the primary contaminants in the BPOU. In 1997 and 1998, EPA discovered several new pollutants, including perchlorate, NDMA and 1,4-dioxane in the groundwater and included them among the contaminants to be remediated (USEPA 2002).

In 1994, EPA adopted the cleanup plan for the BPOU under the ROD. After reaching a detailed agreement with seven local water agencies in March 2002, design work was completed and

construction work began on the groundwater extraction Wells, treatment systems, and related cleanup facilities specified in the ROD. Construction of the four planned groundwater extraction and treatment facilities was largely completed in 2006. Since then, they have been and continue to supply treated groundwater for potable use.

Area 4 Operable Unit

This area consists of Puente Valley Operable Unit (PVOU) which includes most of CIWS and portions of City of La Puente. VOCs, including PCE, TCE, and1,4-dioxane, are the primary contaminants detected in groundwater in the PVOU. VOC concentrations are typically highest in the shallow groundwater beneath facilities where leaks and spills have occurred. VOCs have also spread to the intermediate groundwater zone and portions of the deep groundwater zone.

EPA released a ROD in September 1998 that specified the cleanup plan for the PVOU, which included extraction, containment, and treatment of contaminated groundwater in the shallow and intermediate zones at the mouth of Puente Valley. The remedy also included a set of Wells for monitoring the groundwater in the shallow, intermediate, and deep zones at mid-valley and the mouth of the valley to ensure that the remedy meets the performance criteria set in the September 1998 ROD.

4.6 Puente Valley Operable Unit Intermediate Zone Project

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 LPVCWD's service area and in close proximity to CIWS water distribution facilities. Since staff at LPVCWD already have experience operating a similar groundwater treatment system, the LPVCWD has agreed to operate the Puente Valley Operable Unit Intermediate Zone (PVOU IZ) treatment facility. The LPVCWD 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 its District and for neighboring water purveyors, including CIWS. 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.

CHAPTER FIVE– EXISTING WATER SYSTEM

5.1 General Description

CIWS's primary source of water supply is the groundwater it produces from Well 5 in the MSGB. After water is extracted, it is then delivered to SGVWC for treatment. In exchange, CIWS receives potable water from the SGVWC's distribution system to provide to its customers.

CIWS includes approximately 1,860 service connections, 34.4 miles of distribution and transmission mains, 1 active Well, 5 booster pump stations, and 3 reservoirs.

5.2 Supply System Facilities

The supply system for CIWS consists of groundwater and emergency intertie connections. Under normal operating conditions, the majority of supply is provided through an interconnection with SGVWC.

5.2.1 Groundwater Wells

CIWS owns one active Well (No. 5), one abandoned/destroyed Well (No. 1) and four inactive Wells (2, 3, 4 and Orange). Well Nos. 2 through 5 are located at the CIWS's Well field at 1695 Puente Avenue in Baldwin Park. Currently, only Well No. 5 is operational to service CIWS. Details of the active CIWS Wells are shown in **Table 5-1**. The area of the groundwater basin in which Wells draw their water from is contaminated. Well No. 5 draws water from the contaminated basin and then delivers the water to the SGVWC treatment facility, Plant B5. Well No. 5 water is treated for contaminates and water is subsequently supplied by SGVWC to the CIWS.

Table 5-1 – CIWS Active Wells

Well Designation	Year Installed	SCE Efficiency Test	Capacity (gpm)	Total Head (ft)	Depth (ft)	Casing Dia (in)	Energy Source	Status
No. 5	2008	Yes	1,200	365	785	20	Electric	Active

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

Table 5-2 – CIWS 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. 2	1976[1]	NA	947	16	Electric	Inactive
No. 3	1989[2]	3,300	800	16	Natural Gas	Inactive
No. 4	1973	4,000	743	16	Electric	Inactive
Orange	-	NA	232	NA	NA	Inactive

[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

5.2.2 Emergency Interconnections

CIWS has four (4) active intertie connections and three (3) emergency interconnections with its neighboring agencies. **Table 5-3** below shows the summary of these connections.

Table 5-3 – Interconnection Summary

Connection	From - To	Type	Size	Zone Served	Capacity (gpm)	Status
La Puente Valley County Water District Industry Hills Pkwy Pump Station 3	LPVCWD – Industry Hills (Upper Zone)	Groundwater	12”	Industry Hills	1,200	Emergency
La Puente Valley County Water District Valley Blvd. & Proctor Ave.	LPVCWD – CIWS Zone 1	Groundwater	14”	CIWS Z1	2,000	Emergency
La Puente Valley County Water District Industry Hills Pkwy Pump Station 1 – Hill St.	LPVCWD – CIWS Zone 1	Groundwater	16”	CIWS Z1	2,000	Emergency
La Puente Valley County Water District Industry Hills Reservoir	LPVCWD – Industry Hills (Upper Zone)	Groundwater	8”	Industry Hills	2,000 to LPVCWD 400 to CIWS	Active (Bi-Directional)
San Gabriel Valley Water Co. Salt Lake	SGVWC – CIWS Zone 1	Groundwater	2”	CIWS Z1	50	Active
San Gabriel Valley Water Co. Lomitas Reservoir	SGVWC – CIWS Zone 1	Groundwater	12”	CIWS Z1	2,000	Active
San Gabriel Valley Water Co. Workman Mill Road	SGVWC – CIWS Zone 1	Groundwater	10”	CIWS Z1	2,000	Active

5.3 Booster Pumps

CIWS has five (5) active booster pumping stations within its CIWS. Each one has 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 Southern California Edison (SCE) efficiency test, those results are shown below.

Table 5-4 - Booster Pump Data

Booster Station	Booster Pump Designation	Suction Zone	Discharge Zone	Horse Power	SCE Efficiency Test/Year	Capacity (gpm)	Total Head (ft)	Design Flow (gpm)	Design Head (ft)
Lomitas Booster Station***	Booster 1*	Lomitas Reservoir/ SGVWC	CIWS Zone 1	50	Yes/2012	1,407	80	---	---
	Booster 2	Lomitas Reservoir/ SGVWC	CIWS Zone 1	100	Yes/2011	777	212	1,600	170
	Booster 3*	Lomitas Reservoir/ SGVWC	CIWS Zone 1	100	Yes/2011	1,570	83.8	1,600	170
Industry Hills Booster Station 1	Booster 1	CIWS Zone 1	IH Lower Zone	75	Yes/2014	1,160	161.7	1,100	175
	Booster 2	CIWS Zone 1	IH Lower Zone	75	Yes/2014	1,135	173.2	1,100	175
	Booster 3**	CIWS Zone 1	IH Lower Zone	150	No	---	---	2,200	175
Industry Hills Booster Station 2	Booster 1	IH Lower Zone	IH Upper Zone	75	Yes/2014	1,155	187.5	1,100	175
	Booster 2	IH Lower Zone	IH Upper Zone	75	Yes/2014	1,165	189.9	1,100	175
	Booster 3**	IH Lower Zone	IH Upper Zone	150	N/A	---	---	2,200	175
Industry Hills Booster Station 3	Booster 1	LPVCWD PZ 2	IH Upper Zone	75	N/A	---	---	1,100	195
	Booster 2	LPVCWD PZ 2	IH Upper Zone	75	Yes	---	---	1,100	195
	Booster 3**	LPVCWD PZ 2	IH Upper Zone	150	N/A	---	---	600	175
Lake Loop	Booster 1	IH Upper Zone	Lake Loop	10	N/A	---	---	200	104
	Booster 2	IH Upper Zone	Lake Loop	10	N/A	---	---	200	104
	Booster 3	IH Upper Zone	Lake Loop	10	N/A	---	---	200	104

* Variable frequency drive (VFD) controlled pumps - minimize pressure fluctuation and match the supply and demand
** Gas supply engine driven pump - used as a backup in the event of power outage
*** Emergency generator available

5.4 Reservoirs

Most of the water delivered from the SGVWC interconnection flows into and is stored in the Lomitas 2.5-million-gallon tank located at the Lomitas Booster Station. Water in the Lomitas Reservoir supplies the Lomitas Booster Station and the CIWS's Industry Hills Zone.

The Industry Hills' two (2) 2.5-million-gallon steel tanks were constructed in 1978 and last inspected in 2015. Lomitas' 2.5-million-gallon steel tank was constructed in 1986 and last inspected in 2015.

Table 5-5 shows the summary of the reservoirs within the CIWS.

Table 5-5 – Reservoir Summary

Reservoirs	Base Elevation (ft AMSL)	Overflow Elevation (ft)	Depth (ft)	Geometry	Diameter (ft)	Capacity (MG)
Lomitas	393	28	29	Circular	120	2.5
Industry Hills No.1	745	34	36	Circular	110	2.5
Industry Hills No.2	745	34	36	Circular	110	2.5

5.5 Distribution System

The distribution system for CIWS 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 the CIWS's users and fire hydrants within each pressure zone accordingly.

5.5.1 Pipelines

CIWS has approximately 34.4 miles of water pipeline, ranging in size from 1 inch to 20 inch. According to the Water Model database, there is about 181,631 linear feet (34.4 miles) within the CIWS and about 164,195 linear feet (31.1 miles) of pipelines are between 4 inches and 16 inches. Asbestos Cement Pipe is the most common pipeline material within the system. The CIWS also contains steel, cement mortar lined and coated steel, ductile iron and polyvinyl chloride (PVC). Asbestos cement pipe is no longer readily available due to environmental hazards associated with manufacturing and installation. For that reason, when an asbestos pipeline replacement is needed within the system, it will be 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 (ft)	DIP (ft)	PVC (ft)	STL (ft)	Totals
1	82	-	280	276	639
2	1,456	-	69	11,050	12,574
2.5	175	-	-	886	1,062
3	-	-	-	1,829	1,829
4	10,015	-	1,589	1,647	13,252
6	25,185	181	660	6,323	32,348
8	21,069	3,083	1,329	660	26,143
10	7,884	886	-	515	9,285
12	19,353	1,409	-	5,211	25,972
14	3,979	7,275	-	-	11,253
16	42,958	1,849	-	1,136	45,943
18	500	537	-	-	1,037
20	78	-	-	216	294
Totals	132,734	15,220	3,927	29,749	181,630

5.5.2 Pressure Zones

Currently, there are two main zones and three sub-zones in the CIWS's distribution system. **Figure 5-1** contains a map of the CIWS system showing each Pressure Zone accordingly and **Figure 5-2** shows the hydraulic flow diagram for the CIWS system.

- Pressure Zone 1 is served primarily by the Lomitas Booster Station, which is supplied by the Lomitas Reservoir. SGVWC interconnections can also pressurize Zone 1 if the Lomitas Booster Station is out of service or is unable to meet the supply demand. In the event that the Lomitas Reservoir and Booster Pump Station are out of service, the interconnection with LPVCWD's Zone 1 can temporarily supply the entire CIWS Zone 1 via gravity feed.

- Salt Lake Zone is served by an interconnection from SGVWC.

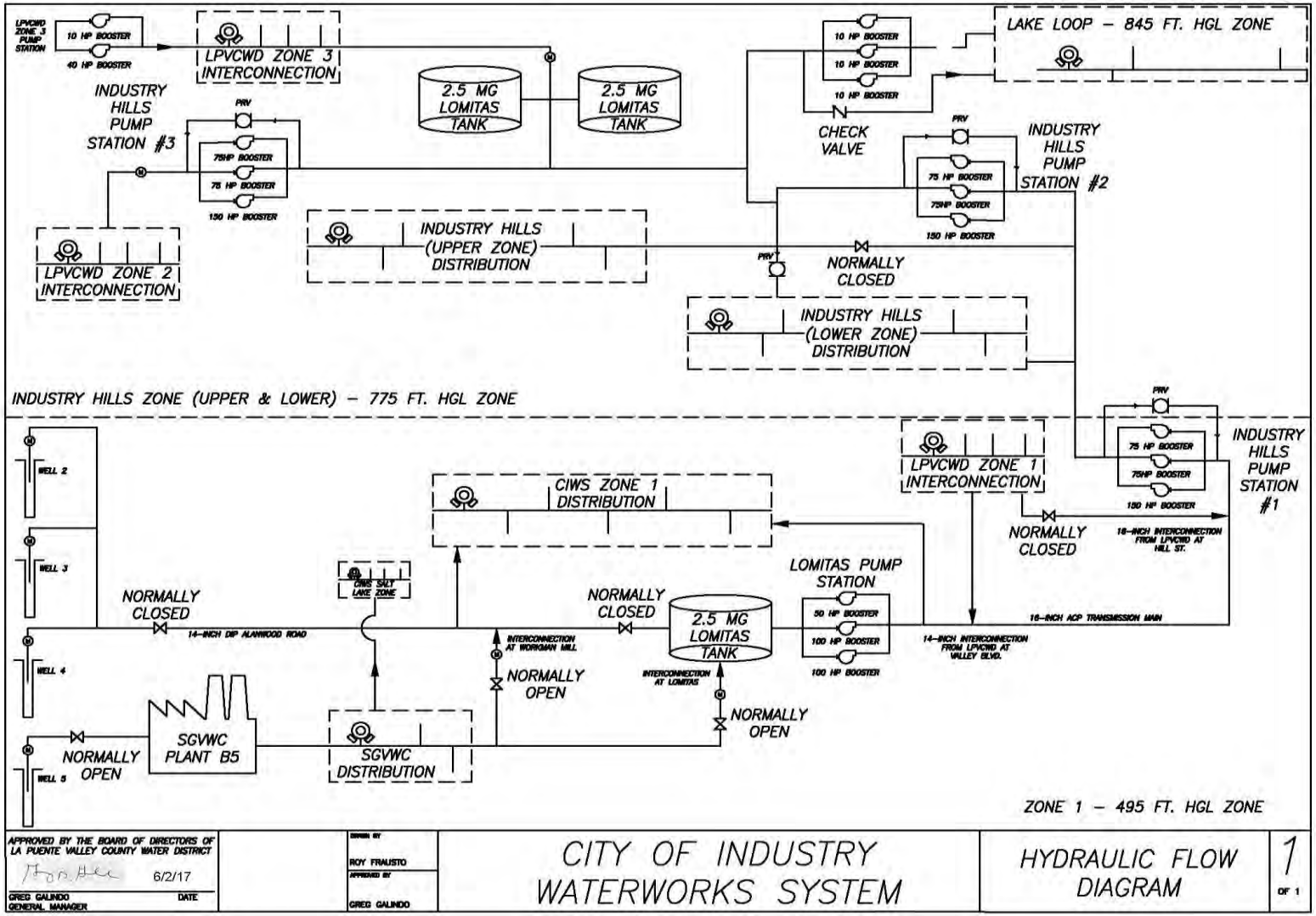
- Industry Hills Pressure Zone is served by the Industry Hills Pump Station 2 located east of Industry Hills Pump Station 1. The Industry Hills Pump Station 1 is located south of Temple Ave and pumps water towards the Wet Well located near Industry Hills Pump Station 2. From there, the water is pumped through Industry Hills Pump Station 2 to the Industry Hills Tanks. Industry Hills Pressure Zone receives water from Zone 2 via a transmission main from Valley Boulevard to Temple Avenue.

- Pump Station 2 Pressure Zone serves a portion of the Industry Hills equestrian area.

- Lake Loop Subzone is served by Lake Loop Booster Station located north of BV Handorf Drive near the Dwight D Eisenhower Golf Course.

Figure 5-1 – Pressure Zones Map

Figure 5-2– Hydraulic Flow Diagram



CHAPTER SIX– COMPUTER MODEL

6.1 General Description

The computer modeling program used to model the CIWS is the InfoWater software by Innovyze. InfoWater is a sophisticated and powerful software package that uses geographic information system (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 CIWS. 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 for CIWS that was required for the development of the hydraulic water system model for their 2017 master plan. The following information was used:

- CIWS's 2009 Master Plan
- CIWS Water Atlas maps
- GIS Files
- Digital Elevation Model (DEM) provided within InfoWater
- Historical water production data records
- Facility Drawings provided by CIWS of booster stations
- 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 Project Engineer through 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 CIWS.

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 and CIWS 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 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 CIWS'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.

There are two types of performance curves used in creating the Water Model. One performance curve is called a "multiple point curve" and the other is called a "design point curve".

[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.

A multiple point curve uses multiple points of head vs. flow to create the pump's performance curve. These points were created by using the manufacture's pump curve as well as the capacity and total head shown on the most recent pump efficiency test. Once these points were obtained and interpolated, the Water Model will create a parabola that would pass through the best fit curve of these points. It is important to note that the Water Model needs to contain a shut-off head where the head would be zero and a shut-off flow point where the flow would be zero to create the approximate curve so that Water Model does not crash during simulations.

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:

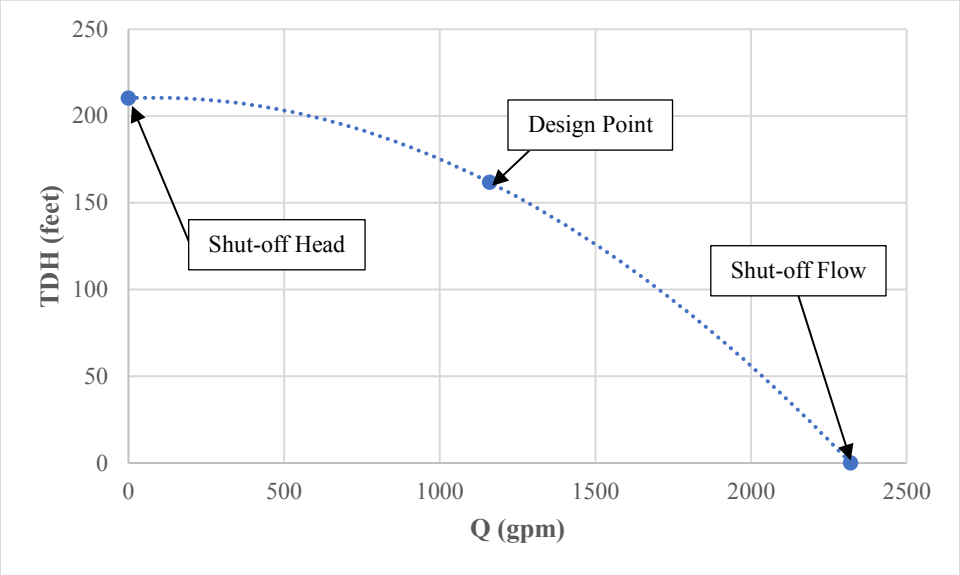
- design point (H, Q)
- shut-off head (1.3H, 0)
- shut-off flow (0, 2Q)

For example, Industry Hills Booster Station 1 Pump No. 1 was rated by SCE to have a flow of 1,160 gpm at a total dynamic head of 162 feet. The Water Model computed the second-degree polynomial curve for the Industry Hills Booster Station 1 Pump No. 1 based on that design point as shown in **Table 6-1** and **Figure 6-1.**

Table 6-1 – Input Data for Industry Hills Booster Station Pump No. 1

Point	H (feet)	Q (gpm)
Shut-off Head	210	0
Design Point	162	1,160
Shut-off Flow	0	2,320

Figure 6-1 – Design Point Curve for Industry Hills Booster Station 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 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 CIWS's production data for the study period of 7 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 CIWS Wells (provided by LPVCWD). The production data covers the water produced per day for each study period calendar years between January 2010 through December 2016.

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

Table 6-2 – Existing Demands within Water System

Pressure Zone	Nodes Programmed	ADD (gpm)	MDD (gpm)	PHD (gpm)
PZ 1	359	708	1,705	2,557
Industry Hills	192	125	301	452
Total Demand (gpm) per Scenario	**551**	**833**	**2,006**	**3,009**

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 increased at an average rate of approx. 1% per year. With this growth rate, along with the existing average demands, future demands were calculated and summarized.

Table 6-3 shows each pressure zone within CIWS and their corresponding demand per scenario.

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

Pressure Zone	Nodes Programmed	ADD (gpm)	MDD (gpm)	PHD (gpm)
PZ 1	359	743	1,790	2,685
Industry Hills	192	132	316	474
Total Demand (gpm) per Scenario	**551**	**875**	**2,106**	**3,159**

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 CIWS model, three different steady state scenarios were created for simulation. These scenarios were (1) ADD, (2) MDD and (3) 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 base map includes elevation data at key intersections throughout the system. Water Model elements adjacent to these intersections were assigned the base map elevation and elements between these intersections were assigned an interpolated value.

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 CIWS.

Each fire flow record contained 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. **Table 6-4** shows the comparison between the field results and the simulated results after calibration was done.

Table 6-4 – Steady State Fire Flow Comparsion

Test No.	Zone	District Atlas Map	Date	Address of Flowing Hydrant	Flow Rate Observed/Modeled (gpm)	Static Pressure			Residual Pressure			Overall Pressure Drop	
						Observed	Simulated	Difference (psi)	Observed	Simulated	Difference (psi)	Observed	Simulated
1	1	B5	11/22/2016	NE corner of San Angelo and Levelwood St.	993	95	93	2	80	79	1	15	14
2	1	B6	11/22/2016	934 Cunningham Dr	964	75	73	2	60	61	-1	15	12
3	1	C7	11/22/2016	SE corner of S. 4th Ave. and E. Lomitas Ave.	904	58	57	1	49	50	-1	9	7
4	1	F7	11/22/2016	Proctor and 6th Intersection	1,289	88	85	3	84	81	3	4	4
5	Lake Loop	J9	-	800 ft. west of Private Road	750	72	80	-8	34	34	0	38	46
6	Industry Hills	I8	-	About 300' East of Avalon Room	1,150	75	73	2	72	70	2	3	3
7	Industry Hills	J10	-	Industry Hills Parkway, in parking lot	1,074	60	60	0	58	58	0	2	2

CHAPTER SEVEN – WATER CONSERVATION PROGRAMS

7.1 General Description

Chapter 7 provides guidance for the implementation of a water conservation program in line with CIWS'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 CIWS'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 CIWS]
2. Large landscape audits of CIWS 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 to goal achievement.

CIWS does not have a clearly 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 are 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 economiscs 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 Urban Water Master Plan (UWMP) Act. However, CIWS 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 CIWS 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 Ultra Low Flush (ULF) Toilets
- Residential Survey
- Irrigation Controllers
- Plumbing Retrofit
- High Efficiency 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 California Urban Water Conservation Council (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 for CIWS. The production data covers the study period between 2010 through 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 CIWS.

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 Water Model, 115 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.

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[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.

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. 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 C**. 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.

[3] Title 22, Chapter 16, §64602

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 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) 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;

[4] Title 17, Chapter 16, §64554

- 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 und 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 of 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

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

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

- 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 will require 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 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 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.

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

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	15	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 states that there should be sufficient supply to meet MDD with the largest source out of service. **Table 9-1** provides capacity per the latest nominal interconnection capacity from interconnect sources. CIWS relies primarily on its interconnect with SGVWC at the Lomitas reservoir for supply. Most of the supply from SGVWC to CIWS is passed through this interconnect. CIWS actively uses two other interconnects to maintain supply. The interconnect at Valley boulevard with LPVCWD is commonly used to supply water to Zone 1 of the CIWS system. CIWS also commonly takes a small amount of water by way of its Salt Lake Interconnect with SGVWC and SGVWC #1 interconnect at Workman Mill. The capacity of the Salt Lake and Workman Mill interconnects are unknown. However historical data indicates there is capacity in these interconnects that should be considered in the supply analysis. The average flow volume observed in recent history is assumed to be the capacity of these interconnects as shown in **Table 9-1.**

Table 9-1 – Supply Analysis

Source*	Supply Capacity (gpm)	Existing Conditions (gpm)	Future Conditions (gpm)
SGVWC Lomitas Reservoir	2,000	2,000	2,000
SGVWC Workman Mill	2,000	2,000	2,000
Sum of LPVCWD Interconnections	5,600	5,600	5,600
Salt Lake (SGVWC)	50	50	50
Puente Valley Operable Unit (PVOU)°			300
Total Supply Capacity without Largest		4,050	4,350
Maximum Day Demand		2,006	2,106
Surplus(Deficit)		2,044	2,244

*Only Active Interconnections are Considered as Sources
°PVOU production water is a planned source to be supplied to CIWS (See **Appendix F**)

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:

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

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

Table 9-2 – Supply Emergency & Fire Refill Requirement

Period	Emergency Storage (MG)	Fire Storage (MG)	Total Refill Volume (MG)	Equivalent Refill Flow Rate (gpm)	MDD (gpm)	Total (gpm)
Existing	2.89	0.96	3.85	1,336	2,006	3,342
Future	3.03	0.96	3.99	1,386	2,106	3,492

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

Table 9-3 – Supply Emergency & Fire Refill Analysis

Source*	Supply Capacity (gpm)	Existing Conditions (gpm)	Future Conditions (gpm)
SGVWC Lomitas Reservoir	2,000	2,000	2,000
SGVWC Workman Mill	2,000	2,000	2,000
Sum of LPVCWD Interconnections	5,600	5,600	5,600
Salt Lake (SGVWC)	50	50	50
Puente Valley Operable Unit (PVOU)°			300
Total Supply Capacity without Largest		9,650	9,950
Maximum Day Demand		3,342	3,492
Surplus(Deficit)		6,308	6,458

***Only Active Interconnections are Considered as Sources**
°PVOU production water is a planned source to be supplied to CIWS (See **Appendix F**)

9.2.3 Supply Recommendation

Application of primary supply design criteria indicates a surplus under existing and future conditions. While there appears to be a surplus under the applied criteria, consideration of the interdependency between the LPVCWD and CIWS system is critical. The Industry Hills Pump Station #3 is rarely (if ever) utilized and evaluation of the ability of Industry Hills Pump Station #1 to supply water from the LPVCWD Zone 1 at the current listed capacity will be performed along with the availability of supply from the Valley/Proctor Avenue connection with Zone 1 of LPVCWD's system. In light of this, the interconnections that are established as emergency have not been considered in the supply analysis. Consideration of expanding the supply capacity will be necessary to fully secure the CIWS supply in the future. While the PVOU supply is included in the future scenario, this supply is expected to be transferred through either the CIWS system or LPVCWD system with ultimate delivery to other users. As a result, an agreement should be put into place to ensure that this water is available for use by CIWS during times of supply deficiencies.

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.

$$V_{Existing\ Emergency} = \left(\frac{2{,}006 gallons}{minute}\right) * \left(\frac{60\ minutes}{1\ hour}\right) * (24\ hours) = 2.89\ MG$$

$$V_{Future\ Emergency} = \left(\frac{2{,}106 gallons}{minute}\right) * \left(\frac{60\ minutes}{1\ hour}\right) * (24\ hours) = 3.03\ MG$$

Operational storage is 30% of one day of MDD.

$$V_{Existing\ Operational} = (0.3) * (2.89\ MG) = 0.87\ MG$$

$$V_{Future\ Operational} = (0.3) * (3.03\ MG) = 0.91\ MG$$

Fire Storage is the requirement for one maximum event:

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

Storage in the Industry Hills Reservoirs is available to all Zones in both the CIWS and LPVCWD 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. **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)
Lomitas	Zone 1	2.50
Industry Hills No. 1	Industry Hills	2.50
Industry Hills No. 2	Industry Hills	2.50
Total		7.50

Table 9-5 summarized and compares the above 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	2.89	0.87	0.96	4.72	7.50	2.78
Future	3.03	0.91	0.96	4.90	7.50	2.60

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 to meet (1) MDD with the largest single pump out of service, and (2) Combined production capacity sufficient to refill emergency and fire storage in two days with all sources operating.

Note that the system's capacity in Zone 1 and Industry Hills Zone 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 while not considering pipeline efficiency.

9.4.1 Pressure Zone 1 Booster Capacity

There are three booster pumps in Zone 1. The Lomitas Booster Station takes suction from the Lomitas Reservoir and delivers water to Zone 1 on a continuous basis to meet the water supply demand of the zone along with supplying water to the Industry Hills Booster Pump Station No.1. This analysis assumes that the largest head pump will be turned off and only two pumps will be operated to handle all demand conditions.

The highest customer service elevation in Zone 1 is at 394 feet. The elevation of the Industry Hills Pump Station No. 1 is 421.5.

MDD+Fire Flow

The pump station is required to deliver the MDD of Zone 1 (1,705 gpm) and fire flow (1,500gpm). Due to the operation of the Industry Hills Pump Station No.1, which draws suction from Zone 1 and which may be simultaneously operated with the Lomitas Pump station, the maximum capacity of one pump in service is considered in this analysis as well. To achieve 20 psi fire flow residual pressure at the suction header to Pump Station No. 1, the hydraulic gradient should be 467.7 feet:

$$421.5\ feet + \left(\frac{20\ lbs}{in^2}\right)\left(\frac{12\ in}{foot}\right)^2\left(\frac{ft^3}{62.4\ lbs}\right) \cong 467.7\ feet$$

Assuming the water surface in Lomitas Reservoir is 407 feet, the total head is 60.7 feet:

$$467.7\ feet - 407\ feet = 60.7 feet$$

MDD + Fire Flow in Zone 1 is 3,205 gpm.

$$1{,}705\ gpm + 1{,}500 gpm = 3{,}205 gpm$$

Figure 9-1 and **Figure 9-2** show the available flow when two pumps are delivering 60.7 feet of head at approximately 1,450 gpm and 2,300 gpm, respectively, totaling 3,750 gpm of supply.

As a result, the two pumps can achieve the MDD + Fire Flow of 3,205 gpm in Zone 1.

Figure 9-1 – Pump 1 vs. MDD/PHD Requirements for Zone 1

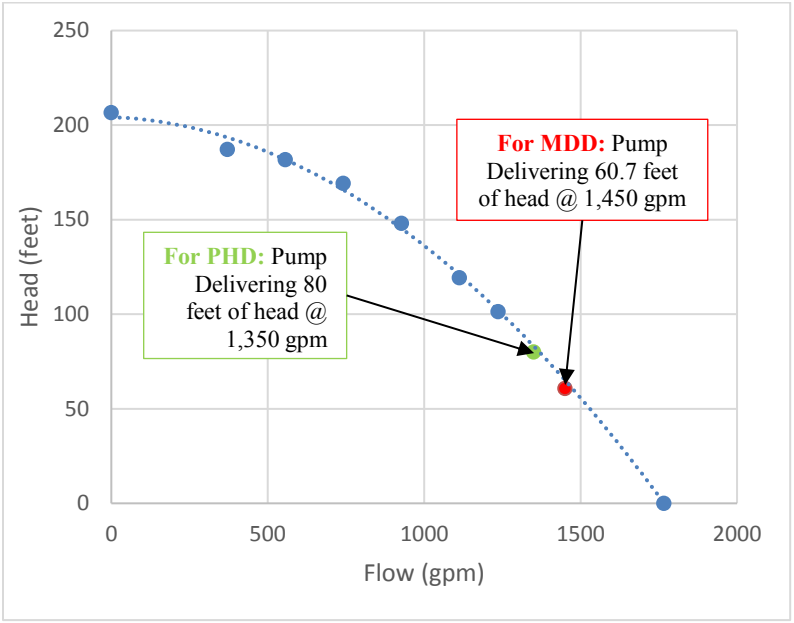
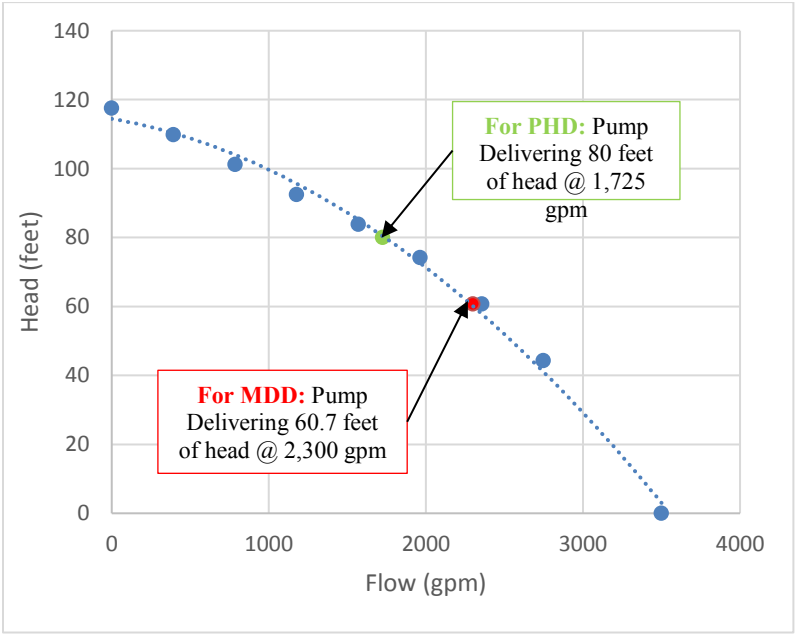


Figure 9-2 – Pump 3 vs. MDD/PHD Requirements for Zone 1



PHD

The PHD analysis considers the demand in Zone 1 only. It is reasonably assumed that the Industry Hills Pump Station is not active during a PHD event in Zone 1. To achieve 40 psi residual pressure at the highest service location, the hydraulic gradient should be at least 487 feet:

$$394\ feet + \left(\frac{40\ lbs}{in^2}\right)\left(\frac{12\ in}{foot}\right)^2\left(\frac{ft^3}{62.4\ lbs}\right) \cong 487\ feet$$

Assuming the water surface in Lomitas Reservoir is 407 feet, the pumps should add 80 feet of head:

$$487\ feet - 407\ feet = 80\ feet$$

The Near Term PHD in Zone 1 is 2,682 gpm.

Figure 9-1and **Figure 9-2** show that the available flow from Booster Pump No.1 and No.3, respectively, when providing 80 feet of head the flow is approximately 1,350 gpm for Pump No. 1 and 1,725 gpm for Pump No. 3 for a total of 3,075 gpm.

As a result, these two pumps can achieve the PHD of 2,682 gpm in Zone 1.

9.4.2 Industry Hills Zone Booster Capacity

There are two booster pump stations in the Industry Hills Zone. The role of Pump Station No. 1 is to deliver water to the Wet Well located at Pump Station No. 2. At Pump Station 2, Booster No. 1 and Booster No. 2 alternate operation to deliver water to the Industry Hills Reservoirs by pumping from the Wet Well. The controls of the zone's booster systems are optimized by simultaneously operating Pump Station No. 2 to match the flow from Pump Station No. 1. If the level within the Pump Station No. 2 Wet Well reaches a low set point a relief valve automatically allows water from the Pump Station No. 2 discharge back into the Wet Well. Ultimately both pump stations operate to maintain a desired water level in the Industry Hills reservoirs.

MDD – Pump Station No. 1

The Total Dynamic Head (TDH) for Pump Station No. 1 can be calculated by determining the difference between the High Water Line (HWL) of the Wet Well at Pump Station No. 2 and the available pressure at the suction side of Pump Station No. 1 under MDD conditions in Zone 1 while maintaining a minimum of 20 psi the Pump Station No. 1 suction piping. The HWL of the Wet Well is 616 feet and the elevation at Pump Station No. 1 is 421.5 feet.

$$421.5\ feet + \left(\frac{20\ lbs}{in^2}\right)\left(\frac{12\ in}{foot}\right)^2\left(\frac{ft^3}{62.4\ lbs}\right) \cong 467.7\ feet$$

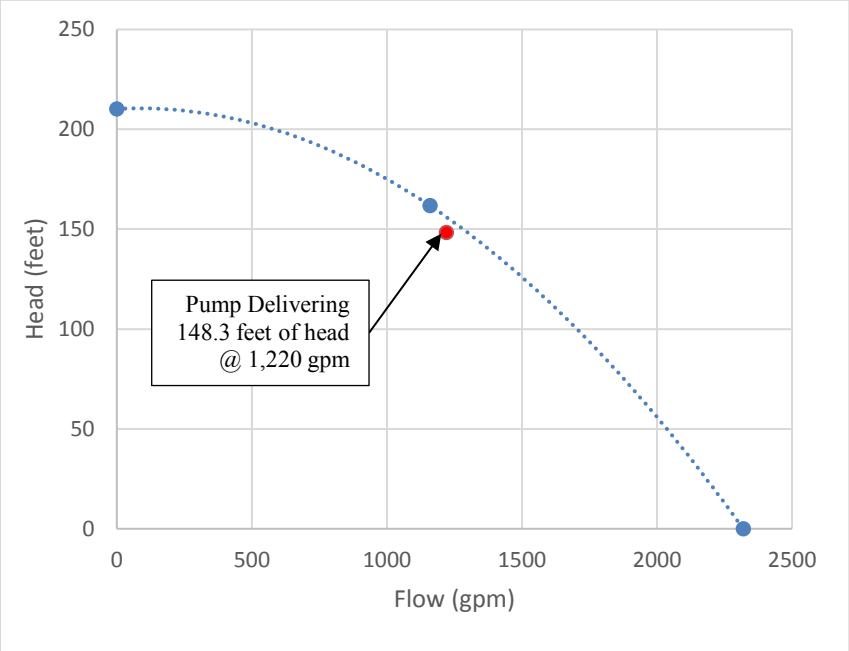
The difference between the two elevations is 148.3 feet:

$$616\ feet - 467.7\ feet = 148.3\ feet$$

MDD in Industry Hills Zone under the future condition is 316 gpm.

Figure 9-3 shows the available flow when one pump is delivering 148.3 feet of head at approximately 1,220 gpm.

Figure 9-3 –Pump Station 1 vs. MDD Requirement for Industry Hills Zone



MDD – Pump Station No. 2

The TDH for Pump Station No. 2 can be calculated by the difference between the HWL of the Industry Hills Reservoir and the Low Water Line (LWL) of the Wet Well at Pump Station 2. The HWL of the reservoir and LWL of the Wet Well is 774 feet and 607.9 feet respectively.

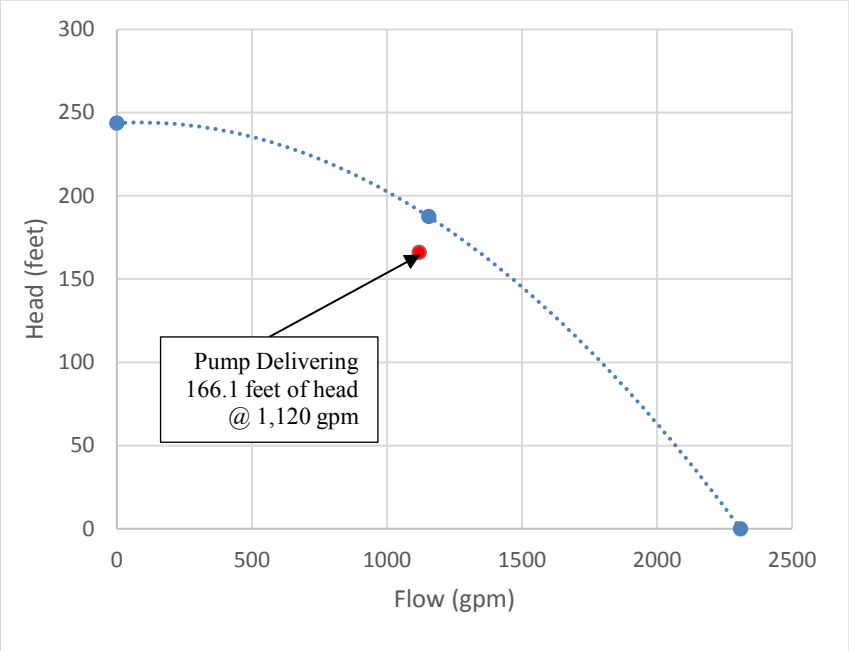
The difference between the two elevations is **166.1 feet**:

$$774\ feet - 607.9\ feet = 166.1\ feet$$

MDD in Industry Hills Zone under the future condition is 316 gpm. This value also considers the small demand in the Lake Loop sub pressure zone.

Figure 9-4 shows the available flow when one pump is delivering 166.1 feet of head at approximately 1,120 gpm.

Figure 9-4 –Pump Station 2 vs. MDD Requirement for Industry Hills Zone



As a result, a single pump from each of Pump Station No. 1 and Pump Station No. 2 can achieve the MDD requirement in Industry Hills Zone.

9.4.3 Lake Loop Booster Station

The Lake Loop booster station services a small sub-zone of the Industry Hills Zone which serves 6 residences. The booster station draws suction from a pipeline feeding the Industry Hills reservoirs. Pumps operate on variable speed control to maintain a constant pressure in the sub-zone. The highest node elevation in the Lake Loop sub-zone is 692 feet.

PHD – Lake Loop Booster Station

The PHD analysis considers the demand in the Lake Loop sub-zone only. To achieve 40 psi residual pressure at the highest service location, the hydraulic gradient should be at least 784 feet:

$$692\ feet + \left(\frac{40\ lbs}{in^2}\right)\left(\frac{12\ in}{foot}\right)^2\left(\frac{ft^3}{62.4\ lbs}\right) \cong 784.3\ feet$$

Assuming the water surface in the Industry Hills Reservoirs is 742 feet, the pumps should add 42 feet of head:

$$784\ feet - 742\ feet = 42\ feet$$

The Near Term PHD in Lake Loop sub-zone is approximately 120 gpm. Each of the three pump in the pump station have a design flow of 200 gpm at a head of 104 feet. Therefore, the booster

station is sufficiently sized to supply water to the sub-zone. In addition, there are existing check valves from the Industry Hills zone to the Lake Loop sub-zone that will provide water in the event of a fire flow demand.

9.4.4 Booster Recommendation

To manage the conditions associated with the operation of Lomitas Booster Pump Station in tandem with the operation of the Industry Hills No. 1 Pump Station, one of the active interconnections may need to be operated if there was a need to supply fire flow in Zone 1 while also pumping water to the Industry Hills zone. The active interconnections are equipped with automatic pressure sustaining control valves to enable supply to Zone 1 in the event of a pressure drop within the zone. To further secure the reliability of supply to Zone 1, a pressure sustaining valve has been installed at the discharge of the Industry Hills Pump Station No. 1 to allow for flow back from the Industry Hills Zone to Zone 1.

Currently, an opportunity for pump cost savings at the Lomitas Booster Station can be explored by LPVCWD interconnections to feed Zone 1. It is recommended to further study the interrelation of CIWS Zone 1 and LPVCWD's Zone 1 to identify if pumping efficiency can be improved by utilizing LPVCWD's Zone 1 storage water as a source for CIWS Zone 1 during peak pumping hours. In addition, to ensure efficient pump operations, pumps should be tested for efficiency on a yearly basis to identify when rehabilitation is needed.

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 residual which generally represents the performance the hydrant is capable of as a worst case scenario. Exhibits were created and are provided in **Appendix E** showing possible improvements that will alleviate fire flow deficiencies.

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 Deficiencies

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

There are no industrial fire flow deficiencies in the CIWS network.

9.5.2 Multi-Family Residential/Commercial Fire Flow Deficiencies

Fire flow demand for multi-family residential and commercial land use is set at 3,000 gpm.

There are no multi-family residential/commercial fire flow deficiencies in the CIWS network.

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 9-6 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. Typical reasons for these types of deficiencies are due to undersized and/or dead-end mains serving the area. Most of these can be improved by creating hydraulic loops, upsizing existing pipelines or the addition of a pressure sustaining valve.

Appendix E shows what the new fire flows would be by adding improvements and/or upsizing existing pipelines to alleviate the current fire flow deficiencies.

Table 9-6 – Single Family Residential Fire Flow Deficiencies

Hydrant Location	Pressure Zone	Static Pressure (psi)	Existing Available Flow @ 20psi (gpm)	Comments on possible improvements to rectify flow deficiency
13721 Loumont St	1	61	1,141	A 6-inch loop would improve this Fire Flow - from Starhill Ln. and 3rd Ave.
882 3rd Ave	1	76	1,093	A 6-inch loop would improve this Fire Flow - from Starhill Ln. and 3rd Ave.
826 3rd Ave	1	61	1,050	A 6-inch loop would improve this Fire Flow - from Starhill Ln. and 3rd Ave.
13850 Lomitas Ave	1	57	659	Upsizing existing 6-inch to 8-inch (~620 feet)
13828 Lomitas Ave	1	41	450	Upsize existing pipelines to be all 8-inch instead of 4-inch and 6-inch (~505 feet)
13929 Porto Rico Dr	1	57	961	A 6-inch loop and upsizing improvements would improve this Fire Flow - From 4th Ave to Trailside Dr.
13962 Porto Rico Dr	1	58	1,170	A 6-inch loop and upsizing improvements would improve this Fire Flow - From 4th Ave to Trailside Dr.
804 S 4th Ave	1	65	1,125	A 6-inch loop and upsizing improvements would improve this Fire Flow - From 4th Ave to Trailside Dr.
13960 Larkport Ave	1	74	973	A 6-inch loop and upsizing improvements would improve this Fire Flow - From 4th Ave to Trailside Dr.
883 4th Ave	1	64	1,026	A 6-inch loop and upsizing improvements would improve this Fire Flow - From 4th Ave to Trailside Dr.
837 4th Ave	1	64	1,055	A 6-inch loop and upsizing improvements would improve this Fire Flow - From 4th Ave to Trailside Dr.
338 S Siesta Ave	1	72	726	Upsizing existing 4-inch to 6-inch (~430 feet)

9.6 Proposed Improvements for Deficiencies

After discussing with LPVCWD's staff, improvements were analyzed to alleviate the fire flow deficiencies within City of Industry's Water Works system.

9.6.1 Starhill Lane and 3rd Avenue (CIP #1)

Table 9-7 provides a summary of the single family residential fire flow deficiencies found in **Table 9-6** after a proposed improvement was implemented into the Water Model.

Table 9-7 – Single Family Residential Fire Flow Deficiencies with Improvements on Starhill Lane & 3rd Avenue

Hydrant Location	Pressure Zone	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
13721 Loumont St.	1	61	1,764	Fire Flow Available is sufficient
882 3rd Ave.	1	76	1,897	Fire Flow Available is sufficient
826 3rd Ave.	1	61	1,351	Fire Flow Available is sufficient

The proposed improvement consists of replacing approximately 520 feet of 4-inch Steel pipeline on Starhill Ln. with 8-inch DIP (primarily due to historical leak frequencies), replacement of 913 feet of 6-inch & 8-inch Steel pipeline on 3rd Ave. with 8-inch DIP, and the construction of approximately 420 feet of 8-inch DIP to loop the distribution system on 3rd. Ave. with Loumont St. With these improvements, the fire hydrants within the area will be able to exceed the available fire flow requirement of 1,250 gpm shown in **Figure 9-5** (also shown as Exhibit 1 in **Appendix E**).

Figure 9-5 – Improvements on Starhill Lane & 3rd Avenue (CIP#1)

9.6.2 Lomitas Lane, south of Lomitas Avenue (CIP #2)

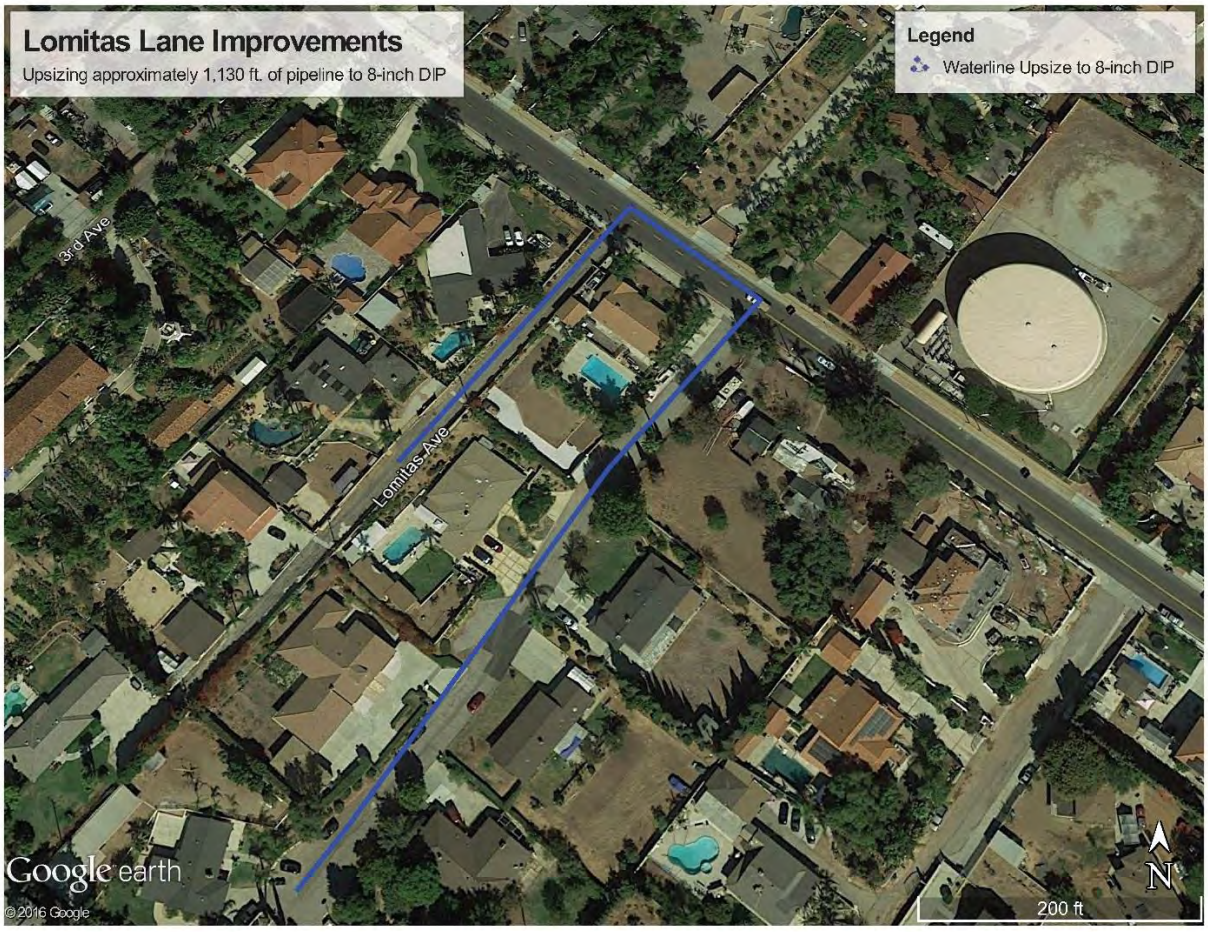
Table 9-8 provides a summary of the single family residential fire flow deficiencies found in **Table 9-6** after a proposed improvement was implemented into the Water Model.

Table 9-8 – Single Family Residential Fire Flow Deficiencies with Improvements on Lomitas Lane

Hydrant Location	Pressure Zone	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
13850 Lomitas Ave	1	42	1,342	Fire Flow Available is sufficient
13828 Lomitas Ave	1	57	1,620	Fire Flow Available is sufficient

By upsizing the existing 6-inch pipeline in E. Lomitas Avenue (~ 195 feet) and upsizing the existing 4-inch pipeline on the private roads of Lomitas Lane (~ 935 feet), the deficient fire hydrants will be able to reach the available fire flow requirement of 1,250 gpm as shown in **Figure 9-6** (also shown as Exhibit 2 in **Appendix E**).

Figure 9-6 – Improvements on Lomitas Lane (CIP#2)



9.6.3 S. 4th Avenue and Trailside Drive (CIP #3)

Table 9-9 provides a summary of the single family residential fire flow deficiency found in **Table 9-6** after a proposed improvement was implemented into the Water Model.

Table 9-9 – Single Family Residential Fire Flow Deficiency with Improvements on S. 4th Avenue and Trailside Drive.

Hydrant Location	Pressure Zone	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
13929 Porto Rico Dr	1	57	1,365	Fire Flow Available is sufficient
13962 Porto Rico Dr	1	58	1,896	Fire Flow Available is sufficient
804 S 4th Ave	1	65	2,189	Fire Flow Available is sufficient
13960 Larkport Ave	1	74	1,419	Fire Flow Available is sufficient
883 4th Ave	1	64	1,782	Fire Flow Available is sufficient
837 4th Ave	1	64	1,926	Fire Flow Available is sufficient

By installing an estimate of 215 feet of 8-inch pipeline from Trailside Drive up to the private street east of S. 4th Avenue and upsizing approximately 1,735 feet of pipeline to 8-inch in S. 4th Avenue, an efficient hydraulic loop is created within the area. 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 9-7** (also shown as Exhibit 3 in **Appendix E**).

Figure 9-7 – Improvements S. 4th Avenue and Trailside Drive (CIP#3)

9.6.4 Siesta Avenue, south of Proctor Avenue (CIP #4)

Table 9-10 provides a summary of the single family residential fire flow deficiencies found in **Table 9-6** after a proposed improvement was implemented into the Water Model.

Table 9-10 – Single Family Residential Fire Flow Deficiency with Improvements on Siesta Avenue

Hydrant Location	Pressure Zone	Static Pressure (psi)	Available Flow @ 20psi (gpm)	Comments
338 S Siesta Ave	1	73	1,656	Fire Flow Available is sufficient

By upsizing the existing 4-inch pipeline in S. Siesta Avenue (~ 650 feet), the deficient fire hydrant will be able to reach the available fire flow requirement of 1,250 gpm as shown in **Figure 9-8**. (also shown as Exhibit 4 in **Appendix E**). If CIWS were to implement this improvement, it would

also rectify the pipeline replacement on Siesta Avenue as identified in the pipeline replacement program due to age covered under CIP #6.

Figure 9-8 – Improvements on Siesta Avenue (CIP#4)

9.6.5 Don Julian Road / Basetdale Avenue Waterline Improvement (CIP #5)

To improve the supply reliability to the CIWS, the proposed improvement consists of constructing approximately 900 feet of 10-inch ductile iron pipeline on Don Julian Road to loop the distribution system at Basetdale Avenue. This improvement would increase fire flows throughout the system as well as the supply reliability to the surrounding area. The proposed improvement is shown in **Figure 9-9** (also shown as Exhibit 5 in **Appendix E**).

Figure 9-9 – Don Julian Road / Basetdale Avenue Waterline Improvement (CIP #5)

9.7 Evaluation Based on Age and Condition

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 9-11 – Infrastructure Replacement Criteria provides a methodology for identifying and corroborating cyclical replacement. Prior to replacement (or maintenance as indicated), both criteria should be met. The Interval criterion represent 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 9-11 – 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, CIWS 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 9-10** provides an overview assessment of current conditions of watermains in the distribution system.

Figure 9-10 – Watermain Leak Repairs (2012-2016)

9.7.1.1 Watermain Pipeline Condition Recommendations

Based on the data observed on **Figure 9-10**, the data plotted shows a few areas with leak hot spots. The first area is a 2-inch PEP line located on Lake Loop Road in the Industry Hills area. The line has had 3 leaks within the last 5 years and is scheduled to be replaced by field personnel during Spring of 2017.

The second area is 2-inch PEP line located on Salt Lake Avenue, however this line has now been replaced with a 2-inch Copper line.

The third area is 4-inch Steel line located on Starhill Lane. The line has had 4 leaks within the last 5 years and has been previously identified as a watermain improvement project under Improvements on Starhill Lane & 3rd Avenue (CIP #1) of this chapter.

9.7.2 Service Line Evaluation Based on Conditions

As previously mentioned, CIWS 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 9-12** provides an overview assessment of service line repairs and service line replacements performed in the distribution system.

Table 9-12 – Service Line Leak Repairs and Replacements (2012-2016)

SERVICE LINE REPAIRS						
Type	**2012**	**2013**	**2014**	**2015**	**2016**	**5 Yr Total**
Copper	0	1	3	0	1	5
Galvanized	0	0	1	0	0	1
PEP	3	3	2	0	5	13
Totals	3	4	6	0	6	19
SERVICE LINE REPLACEMENTS						
Type	**2012**	**2013**	**2014**	**2015**	**2016**	**5 Yr Total**
Copper	0	0	0	0	0	0
Galvanized	0	2	0	0	0	2
PEP	23	47	19	15	16	120
Totals	23	49	19	15	16	122

9.7.2.1 Service Line Condition Recommendations

Based on the data observed on **Table 9-12,** the data listed identifies that PEP service lines fail more commonly and need replacement. As a result, LPVCWD field staff has initiated a service replacement program to replace all the PEP services.

9.7.3 Watermain Pipeline Replacement Based on Age

In 2012, AWWA published a report on water pipeline replacement called Buried No Longer: Confronting America's Water Infrastructure Challenge. The report suggests that Asbestos-Cement Pipe (ACP) and Steel pipe in the western United States has average service life of 75 and 95 years. Statistically speaking, this means half of all ACP and Steel pipes last longer than 75 and 95 years and half are replaced before those ages. The largest portion of pipes at CIWS is AC Pipe (73%) and Steel Pipe (16%).

This implies that once the CIWS distribution system is mature, an average of 13,273 feet of AC Pipe and 2,959 feet of Steel replacement should be scheduled per year:

However, CIWS distribution system is a comparatively young system and no pipelines are more than 75 and 95 years.

It is estimated CIWS's distribution system will reach maturity in 17 years for AC Pipe and 34 years for steel pipe, 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 steel
- No pipe age and condition issues in 2016
- Distribution system maturity will occur in 17 years (i.e. 2033), at which time a replacement schedule of 13,273 feet per year is required indefinitely.
- Using a straight-line projection, CIWS should consider a pipe replacement that starts at zero in 2016 and increases by 780 feet per year until 2033:

$$\frac{13{,}273\ feet\ per\ year}{2033 - 2016} \cong 780\ feet\ per\ year$$

Over the next ten years, this approach implies replacement of 35,100 feet of pipe, as shown in **Table 9-13**.

Table 9-13– Near Term Pipeline Replacement Schedule

Year	Feet of Pipe per Year
2016	0
2017	780
2018	1,560
2019	2,340
2020	3,120
2021	3,900
2022	4,680
2023	5,460
2024	6,240
2025	7,020
Total for Ten years	**35,100**

Pipeline replacement is prioritized based on field reports of leakage, age and hydraulic capacity. Pipelines with a high level of leakage, that are old and have hydraulic deficiencies are considered high priority projects.

There are three categories that create the hierarchy of for water main replacements along with the moderate pipeline replacement program discussed above. These three categories are as follows:

- Age *(from oldest to youngest)*
- Diameter *(from smallest to largest)*
- Pipeline Material

By obtaining the attributes of each pipeline in the system with the InfoWater software and the help of the atlas and staff at LPVCWD, pipelines were identified as candidates for replacement based on the aforementioned hierarchy.

According to records, CIWS distribution system's oldest pipe age is 1955. At the estimated year of 2033 when the system would reach maturity, the age of pipelines younger than 1958 would reach its service life and need to be replaced. By creating queries within the computer model and running simulations, it was determined there is approximately 1,050 feet of pipeline of the age of 1958 or earlier. These pipelines are located in CIWS's Pressure Zone 1. **Figure 9-11** shows the pipelines of the age of 1955 and **Figure 9-12** shows the pipelines of age 1958.

Figure 9-11 – Siesta Avenue: Pipelines Age 1955 (CIP #3)

There is approximately 660 feet in CIWS Pressure Zone 1 of 4-inch pipelines of the age of 1955 that would need to be replaced by the year 2033. The pipeline to be replaced is located on S Siesta Avenue, south of Proctor Avenue. This replacement would also have a positive impact on the Fire Flow Deficiency on 338 Siesta Ave as shown in **Table 9-10**.

Figure 9-12 – Lomitas Ave: Pipelines Age 1958 (CIP #6)

There is approximately 400 feet in CIWS Pressure Zone 1 of 6-inch pipelines of the age of 1958 that would need to be replaced by the year 2033. The pipeline to be replaced is located on E. Lomitas Avenue, between S. 4th Street and Forestview Avenue.

9.7.4 Pump Maintenance based on Age

There is 1 existing Well pump and 15 existing booster pumps for a total of 16 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 5 pump overhauls and 5 pump replacement.

$$\left(\frac{16\ pumps}{30\ year\ cycle}\right)(10\ years) \cong 5\ pumps\ per\ 10\ year\ period$$

9.7.5 Pump Maintenance based on Condition

Based on SCE pump efficiency testing, all Lomitas pumps are below the 65% efficiency rating threshold should be considered for overhaul or replacement. **Table 9-14** lists the current ratings of the pumps which are candidates for repair of replacement.

Table 9-14 – Pumps According to Efficiency Rating

Pump Name	Eff. (%)
Lomitas No. 2	53.8
Lomitas No. 1	58.6
Lomitas No. 3	71.0
Industry Hills B-1 PS No. 1	70.5
Industry Hills B-2 PS No. 1	72.6
Industry Hills B-1 PS No. 2	73.8
Industry Hills B-2 PS No. 2	75.0
Industry Hills B-3 PS No. 2	75.0
Well No. 5	58.9

There are no SCE pump efficiency testing results for 7 out of 16 pumps in the CIWS system. Industrial Hills Zone pumps have higher efficiency than 65%. According to the above table, there are 3 pumps that require an overhaul.

9.7.6 Control Valve Overhaul

Control Valves should be scheduled for overhaul on a 25-year cycle.

The interconnects at SGVWC Salt Lake and SGVWC Workman Mill are candidates for control valve overhaul.

9.7.7 Tank Recoating

Tank interiors should be scheduled for recoating on a 15-year cycle. There are three existing tanks. The Industry Hills reservoirs were recently painted and have a useful service life remaining. The Lomitas reservoir is due for tank recoating in the next 10-year period.

$$\left(\frac{1\ tank}{15\ year\ cycle}\right)(10\ years) \cong 1\ tanks\ recoatings\ per\ 10\ year\ period$$

9.7.8 Tank Replacement and Refurbishment

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

9.7.9 Well Refurbishment or Replacement

On a 50-year refurbishment/replacement cycle, one active Well (Well No. 5) exceeds or will exceed its recommended life cycle during the next ten years in terms of age. Well No. 5 will be 50 years in 2034 which implies that refurbishment be performed in the next 10 years.

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 CIWS's budgeting allocations.

9.8.1 Cost Assumptions

Estimates for capital project are based on the cost assumptions provided in **Table 9-15.**

Table 9-15 – 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 Estimated Capital Project Cost's

Based on the Capital Project's identified in the section, **Table 9-16** summarized the estimate cost for each project.

Table 9-16 – Capital Projects ($1,000s)

CIP #	Category	Project	Priority	Justification	Size (in)	Length (FT)	Constr.	Engr. & Admin. (~25%)	Cont. (10%)	Total
1	Fire Flow	Improvements on Starhill Lane & 3rd Avenue	Medium	Fire flow deficiency (Residential)	8	913	274	68	27	370
	Fire Flow	Improvements on Starhill Lane & 3rd Avenue	Medium	Fire flow deficiency (Residential)	8	420	126	32	13	170
	Fire Flow /Condition	Improvements on Starhill Lane & 3rd Avenue	Medium	Repeated main leaks	8	520	156	39	16	211
2	Fire Flow	Pipeline Improvements in E Lomitas Avenue	Low	Fire flow deficiency (Residential)	8	1,130	339	85	34	458
3	Fire Flow	Improvements S. 4th Avenue and Trailside Drive	Medium	Fire flow deficiency (Residential)	8	1,950	585	250	59	894
4	Fire Flow	Improvements on Siesta Avenue	Medium	Fire flow deficiency (Residential)	6	650	195	49	20	263
5	Fire Flow	Pipeline Improvements in Don Julian Rd.	Medium	Fire flow deficiency (Residential)	10	900	270	68	27	365
6	Condition	Lomitas Waterline Replacements	Low	Replace aging waterline	6	400	120	30	12	162
Total										**2,893**

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 Generator Maintenance

The generator located at 13831 Lomitas Avenue will be evaluated to determine if retrofit or replacement is needed to meet current SCAQMD standards.

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

LPVCWD staff has identified that aging galvanized and polyethylene pipe service lines pose problems with service leaks. As a result, the LPVCWD staff created an ongoing program to replaced galvanized and polyethylene service lines with copper service lines. The program consists of replacing the service lines that meet this criterion when leaks are discovered on any part of the service line. In review of the CIWS's 5-year leak repair history, almost all service line leaks are stem from PEP. 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. This program shall continue over the next five-year period at a pace of approximately 20 service line replacements a year.

9.8.3.3 Aging Cast Iron Service Saddle Replacements

LPVCWD staff has experienced leaks on services that were installed using cast-iron saddles throughout the system. Given the high probability of leaks on these types of saddles due to corrosion, LPVCWD staff plans identify to replace the remaining cast iron service saddles in the system with bronze double strapped saddles.

9.8.3.4 Valve Replacements

During valve maintenance activities, LPVCWD staff takes note of valves that pose difficulty in operating or of 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 five years or more into the future.

9.8.3.5 Valve Insertions

During pipeline shutdown activities, LPVCWD staff takes note of shutdowns that have a high impact to surrounding areas. As a result, LPVCWD staff has identified that valve insertions are needed on the 16-inch water main located on Lomitas Ave. as shown in **Figure 9-13.**

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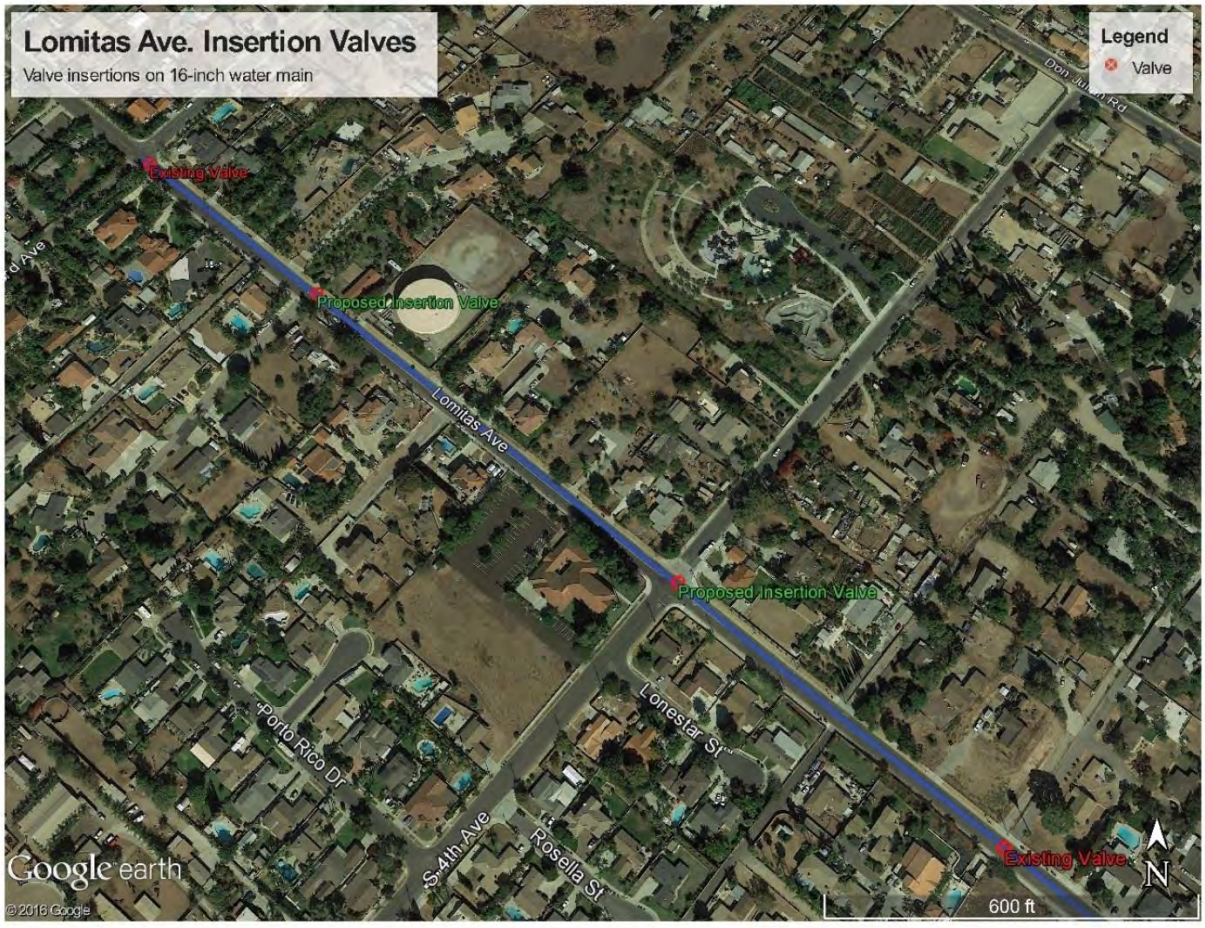
Figure 9-13 – Lomitas Ave. Insertion Valves



9.8.3.6 Tank Recoating

As stated in section 9.7.6, paints and other protective coatings are used on both the interior and exterior of steel tanks to prevent such deterioration. Based on the CIWS's tank cyclical maintenance, the Lomitas tank will need to be recoated.

9.8.3.7 Estimated Maintenance Project Cost

Based on the Maintenance Projects identified in this section, **Table 9-17** summarized the estimated cost for each project over the upcoming 10-year period.

Table 9-17 – Maintenance Projects ($1,000s)

Category	Project	Priority	Justification	Constr.	Engr.	Cont.	Total
Boosters	3 Booster Pump Rehabs and 1 Well Pump Rehab	Medium	Booster Cyclical Maintenance	300	75	30	**405**
Generator	Maintenance of Generator at Lomitas Ave	Medium	Update or Replace to current AQMD standards	250	63	25	**338**
Control Valves	2 Control Valve	Medium	Valve Cyclical Maintenance	100	25	10	**135**
System Valves	System Valve Replacements	Medium	Valve Cyclical Replacement	80	20	8	**108**
System Valve Insertions	Insertion Valves on Lomitas Ave	Medium	High Impact Water Outage	45	11	5	**61**
Service Laterals and Saddles	Service Lateral Replacements	Medium	Valve Cyclical Replacement	500	125	50	**675**
Total							**1,722**

APPENDIX A

CIWS 2015 Consumer Confidence Report

INDUSTRY PUBLIC UTILITIES

2015 Consumer Confidence Report

KNOW YOUR WATER

Industry Public Utilities is committed to keeping you informed on the quality of your drinking water. This report is provided to you annually and it includes information on where your drinking water comes from, the constituents found in your drinking water and how the water quality compares with the regulatory standards. We are proud to report that during 2015, the drinking water provided by Industry Public Utilities met or surpassed all Federal and State drinking water standards. We remain dedicated to providing you with a reliable supply of high quality drinking water.

This report contains important information about your drinking water. Translate it or speak with someone who understands it. For more information or questions regarding this report, please contact Mr. Greg Galindo at (626) 336-1307.

Este informe contiene información muy importante sobre su agua potable. Para más información o preguntas con respecto a este informe, póngase en contacto con el Sr. Greg Galindo (626) 336-1307.

Connect With Us

Industry Public Utilities Commission

Mark D. Radecki
President

Abraham N. Cruz
Commissioner

Roy Haber, III
Commissioner

Cory C. Moss
Commissioner

Newell W. Ruggles
Commissioner

GOVERNANCE

Regularly scheduled meetings of Industry Public Utilities Commission are held on the third Thursday of each month at 9:00 am at 15651 East Stafford Street, City of Industry. These meetings provide an opportunity for public participation in decisions that may affect the quality of your water.

GENERAL INFORMATION

Office Hours: Monday - Friday 8 a.m.-5 p.m.
Phone: (626) 336-1307
Fax: (626) 330-2675
Email: service@lapuentewater.com

Address: 112 North First Street
La Puente, CA 91744

After hours emergency service: (626) 336-1307

WHERE DOES MY DRINKING WATER COME FROM?

WATER SOURCES

Industry Public Utilities water system is operated and managed by the La Puente Valley County Water District. During 2015, Industry Public Utilities' water supply came from San Gabriel Valley Water Company (SGVWC) and La Puente Valley County Water District wells and the City of Industry Well No. 5 all located within the Main San Gabriel Groundwater Basin. This well water is treated and then disinfected with chlorine before it is delivered to your home.

DRINKING WATER SOURCE ASSESSMENT

An assessment of the drinking water sources for SGVWC was updated in October 2008. The assessment concluded that SGVWC's sources are considered most vulnerable to the following activities or facilities associated with contaminants detected in the water supply: leaking underground storage tanks, hardware/lumber/parts stores, hospitals, gasoline stations, and known contaminant plumes. In addition, the sources are considered most vulnerable to the following activities or facilities not associated with contaminants detected in the water supply: above ground storage tanks, spreading basins, storm drain discharge points and transportation corridors. You may request a summary of the assessment by contacting La Puente Valley County Water District's office at 626-330-2126.

An assessment of the drinking water sources for La Puente Valley County Water District was completed in March 2008. The assessment concluded that the La Puente Valley County Water District's sources are considered most vulnerable to the following activities or facilities associated with contaminants detected in the water supply: leaking underground storage tanks, known contaminant plumes and high density of housing. In addition, the sources are considered most vulnerable to the following facility not associated with contaminants detected in the water supply: transportation corridors – freeways/state highways. You may request a summary of the assessment by contacting La Puente Valley County Water District's office at 626-330-2126.

WHAT ARE WATER QUALITY STANDARDS?

In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and the State Water Resources Control Board, Division of Drinking Water (DDW) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. DDW regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

Drinking water standards established by USEPA and DDW set limits for substances that may affect consumer health or aesthetic qualities of drinking water. The chart in this report shows the following types of water quality standards:

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible.

Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Primary Drinking Water Standard (PDWS): MCLs for contaminants that affect health along with their monitoring and reporting requirements and water treatment requirements.

Regulatory Action Level (AL): The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

Notification Level (NL): An advisory level which, if exceeded, requires the drinking water system to notify the governing body of the local agency in which users of the drinking water reside (i.e. city council/county board of supervisors).

In addition to mandatory water quality standards, USEPA and DDW have set voluntary water quality goals for some contaminants. Water quality goals are often set at such low levels that they are not achievable in practice and are not directly measurable. Nevertheless, these goals provide useful guideposts and direction for water management practices. The chart in this report includes three types of water quality goals:

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

WHAT CONTAMINANTS MAY BE PRESENT IN SOURCES OF DRINKING WATER?

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses.

Radioactive contaminants, which can be naturally-occurring or can be the result of oil and gas production and mining activities.

Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gasoline stations, urban stormwater runoff, agricultural application, and septic systems.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

WHAT IS IN MY DRINKING WATER?

Your drinking water is tested by certified professional water system operators and certified laboratories to ensure its safety. The chart in this report shows the average and range of concentrations of the constituents tested in your drinking water during year 2015 or from the most recent tests. The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old. The chart lists all the contaminants detected in your drinking water that have Federal and State drinking water standards. Detected unregulated contaminants of interest are also included.

ARE THERE ANY PRECAUTIONS THE PUBLIC SHOULD CONSIDER?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

INFORMATION ON LEAD IN DRINKING WATER

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The Industry Public Utilities is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at: https://www.epa.gov/lead.

NITRATE ADVISORY

At times, nitrate in your tap water may have exceeded one-half the MCL, but it was never greater than the MCL. The following advisory is issued because in 2015 we recorded a nitrate measurement in the treated drinking water which exceeded one-half the nitrate MCL.

"Nitrate in drinking water at levels above 10 milligrams per liter (mg/L) is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider."

2015 SAMPLE RESULTS

PRIMARY STANDARDS

ANALYTE	YEAR SAMPLED	UNIT	MCL (MRDL)	PHG (MCLG)	DLR	AVERAGE [1]	RANGE	VIOLATION	MAJOR SOURCE OF CONTAMINANT
INORGANIC CHEMICALS									
Arsenic	2015	µg/l	10	0.004	2	2.2	ND - 3	No	Erosion of natural deposits
Barium	2015	mg/l	1	2	0.1	0.12	ND - 0.19	No	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits
Fluoride	2015	mg/l	2	1	0.1	0.33	0.23 - 0.43	No	Erosion of natural deposits
Hexavalent Chromium	2015	µg/l	10	0.02	1	3.3	2.1 - 4.7	No	Runoff/leaching from natural deposits
Nitrate as N	2015	mg/l	10	10	0.4	7.1	1.7 - 8.4	No	Leaching from fertilizer use
RADIOLOGICALS									
Gross Alpha Particle Activity	2015	pCi/L	15	(0)	3	4.4	ND - 12	No	Decay of natural and man-made deposits
Uranium	2015	pCi/L	20	0.43	1	3.2	1.2 - 5.7	No	Erosion of natural deposits

SECONDARY STANDARDS

ANALYTE	YEAR SAMPLED	UNIT	MCL (MRDL)	PHG (MCLG)	DLR	AVERAGE	RANGE	VIOLATION	MAJOR SOURCE OF CONTAMINANT
Chloride	2015	mg/l	500	NA	NA	29	19 - 44	No	Runoff/leaching from natural deposits
Foaming Agents	2015	µg/l	500	NA	NA	<50 [2]	ND - 50	No	Municipal and industrial waste discharges
Odor-Threshold [6]	2015	TON	3	NA	1	1	1	No	Runoff/leaching from natural deposits
Specific Conductance	2015	µmho/cm	1,600	NA	NA	590	410 - 790	No	Substances that from ions in water
Sulfate	2015	mg/l	500	NA	0.5	44	26 - 70	No	Runoff/leaching from natural deposits
Total Dissolved Solids	2015	mg/l	1,000	NA	NA	380	260 - 530	No	Runoff/leaching from natural deposits

OTHER CONSTITUENTS OF INTEREST

ANALYTE	YEAR SAMPLED	UNIT	MCL (MRDL)	PHG (MCLG)	DLR	AVERAGE	RANGE	VIOLATION	MAJOR SOURCE OF CONTAMINANT
Alkalinity	2015	mg/l	NA	NA	NA	190	140 - 270	No	Runoff/leaching from natural deposits
Calcium	2015	mg/l	NA	NA	NA	80	54 - 110	No	Runoff/leaching from natural deposits
Hardness (as $CaCO_3$)	2015	mg/l	NA	NA	NA	260	180 - 350	No	Runoff/leaching from natural deposits
Magnesium	2015	mg/l	NA	NA	NA	15	10 - 20	No	Runoff/leaching from natural deposits
pH	2015	Unit	NA	NA	NA	7.9	7.8 - 8	No	Hydrogen ion concentration
Potassium	2015	mg/l	NA	NA	NA	3.8	2.6 - 5.1	No	Runoff/leaching from natural deposits
Sodium	2015	mg/l	NA	NA	NA	20	13 - 29	No	Runoff/leaching from natural deposits

UNREGULATED SUBSTANCES [4]

ANALYTE	YEAR SAMPLED	UNIT	MCL (MRDL)	PHG (MCLG)	AVERAGE	RANGE	VIOLATION	MAJOR SOURCE OF CONTAMINANT
Chlorate	2015	µg/l	800	NA	260	210 - 300	No	Byproduct of drinking water chlorination; industrial processes
Chlorodifluoromethane	2015	µg/l	NA	NA	<0.08	ND - 0.13	No	Refrigerant
Molybdenum	2015	µg/l	NA	NA	2.6	2.3 - 2.8	No	Runoff/leaching from natural deposits
Strontium	2015	µg/l	NA	NA	630	590 - 660	No	Runoff/leaching from natural deposits
Vanadium	2015	µg/l	50	NA	1.6	ND - 3.2	No	Runoff/leaching from natural deposits

DISTRIBUTION SYSTEM WATER QUALITY

ANALYTE	YEAR SAMPLED	UNIT	MCL (MRDL)	PHG (MCLG)	AVERAGE	RANGE	MAJOR SOURCE OF CONTAMINANT
Total Coliform Bacteria	2015	positive/ negative	< 1 positive monthly sample	0	0	0	Naturally present in the environment
Total Trihalomethanes	2015	µg/l	80	NA	13	4.2 - 13	By-product of drinking water disinfection
Haloacetic Acids	2015	µg/l	60	NA	1.4	ND - 1.4	By-product of drinking water disinfection
Chlorine Residual	2015	mg/l	(4)	(4)	1	0.8 - 1.4	Drinking water disinfectant added for treatment
Odor-Threshold [5]	2015	TON	3	NA	1	1	Naturally occurring organic materials
Turbidity [5]	2015	NTU	5	NA	<0.1 [3]	ND - 0.2	Runoff/leaching from natural deposits

LEAD & COPPER

ANALYTE	YEAR SAMPLED	UNIT	AL	PHG (MCLG)	90TH %TILE	SITES ABOVE AL	MAJOR SOURCE OF CONTAMINANT
Lead	2013	µg/l	15	0.2	ND <5	0/20	Corrosion of household plumbing
Copper	2013	mg/l	1.3	0.3	0.44	0/20	Corrosion of household plumbing

A total of 20 residences were tested for lead and copper in July 2013. Lead was not detected above the reporting limit in any of the samples. Copper was detected above the reporting limit in 11 samples, none of which exceeded the AL . The Industry Public Utilities complies with the Lead and Copper Rule. The next required sampling for lead and copper will be conducted in the summer of 2016.

NOTES

AL = Action Level
DLR = Detection Limit for Purposes of Reporting
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
mg/l = parts per million or milligrams per liter
ng/l = parts per trillion or nanograms per liter
MRDL = Maximum Residual Disinfectant Level
MRDLG = Maximum Residual Disinfectant Level Goal
NA = No Applicable Limit
ND = Not Detected at DLR
NL = Notification Level
TON = Threshold Odor Number
NTU = Nephelometric Turbidity Units
pCi/l = picoCuries per liter
PHG = Public Health Goal
µg/l = parts per billion or micrograms per liter
µmho/cm = micromhos per centimeter

1. The results reported in the table are average concentrations of the constituents detected in your drinking water during year 2015 or from the most recent tests. Treated water data are provided by San Gabriel Valley Water Company and La Puente Valley County Water District.
2. Constituent does not have a DLR. Constituent was detected but the average result is less than the analytical Method Reporting Limit.
3. "<" means the constituent was detected but the average result is less than the indicated reporting limit or DLR.
4. Monitoring data provided by San Gabriel Valley Water Company.
5. This water quality is regulated by a secondary standard to maintain aesthetic characteristics (taste, odor, color).

APPENDIX B

Title 22 Code of Regulations

NOTE: This publication is meant to be an aid to the staff of the State Board's Division of Drinking Water and cannot be relied upon by the regulated community as the State of California's representation of the law. The published codes are the only official representation of the law. Refer to the published codes—in this case, Title 17 and 22 CCR—whenever specific citations are required.

State Water Resources Control Board

Regulations Related to Recycled Water

July 16, 2015

Sections amended, adopted, repealed, or not included in the previous version are highlighted in yellow. If the text in a section, subsection, or paragraph is highlighted, it is new. If only the section/paragraph number is highlighted, it was amended or repealed. Some nonsubstantive revisions may not be shown.

TITLE 17 CODE OF REGULATIONS

Division 1. State Department of Health Services

Chapter 5. Sanitation (Environmental)

Group 4. Drinking Water Supplies

Article 1. General.

§7583. Definitions.

In addition to the definitions in Section 4010.1 of the Health and Safety Code, the following terms are defined for the purpose of this Chapter:

(a) "Approved Water Supply" is a water supply whose potability is regulated by a State of local health agency.

(b) "Auxiliary Water Supply" is any water supply other than that received from a public water system.

(c) "Air-gap Separation (AG)" is a physical break between the supply line and a receiving vessel.

(d) "AWWA Standard" is an official standard developed and approved by the American Water Works Association (AWWA).

(e) "Cross-Connection" is an unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome, and potable. By-pass arrangements, jumper connections, removable sections, swivel or changeover devices, or other devices through which backflow could occur, shall be considered to be cross-connections.

(f) "Double Check Valve Assembly (DC)" is an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the watertightness of each check valve.

(g) "Health Agency" means the California Department of Health Services, or the local health officer with respect to a small water system.

(h) "Local Health Agency" means the county or city health authority.

(i) "Reclaimed Water" is a wastewater which as a result of treatment is suitable for uses other than potable use.

(j) "Reduced Pressure Principle Backflow Prevention Device (RP)" is a backflow preventer incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing.

(k) "User Connection" is the point of connection of a user's piping to the water supplier's facilities.

(l) "Water Supplier" is the person who owns or operates the public water system.

(m) "Water User" is any person obtaining water from a public water supply.

§7584. Responsibility and scope of program.

The water supplier shall protect the public water supply from contamination by implementation of a cross-connection control program. The program, or any portion thereof, may be implemented directly by the water supplier or by means of a contract with the local health agency, or with another agency approved by the health agency. The water supplier's cross-connection control program shall for the purpose of addressing the requirements of Sections 7585 through 7605 include, but not be limited to, the following elements:

(a) The adoption of operating rules or ordinances to implement the cross-connection program.

(b) The conducting of surveys to identify water user premises where cross-connections are likely to occur,

(c) The provisions of backflow protection by the water user at the user's connection or within the user's premises or both,

(d) The provision of at least one person trained in cross-connection control to carry out the cross-connection program,

(e) The establishment of a procedure or system for testing backflow preventers, and

(f) The maintenance of records of locations, tests, and repairs of backflow preventers.

§7585. Evaluation of hazard.

The water supplier shall evaluate the degree of potential health hazard to the public water supply which may be created as a result of conditions existing on a user's premises. The water supplier, however, shall not be responsible for abatement of cross-connections which may exist within a user's premises. As a minimum, the evaluation should consider: the existence of cross-connections, the nature of materials handled on the property, the probability of a backflow occurring, the degree of piping system complexity and the potential for piping system modification. Special consideration shall be given to the premises of the following types of water users:

(a) Premises where substances harmful to health are handled under pressure in a manner which could permit their entry into the public water system. This includes chemical or biological process waters and water from public water supplies which have deteriorated in sanitary quality.

(b) Premises having an auxiliary water supply, unless the auxiliary supply is accepted as an additional source by the water supplier and is approved by the health agency.

(c) Premises that have internal cross-connections that are not abated to the satisfaction of the water supplier or the health agency.

(d) Premises where cross-connections are likely to occur and entry is restricted so that cross-connection inspections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connections do not exist.

(e) Premises having a repeated history of cross-connections being established or re-established.

§7586. User supervisor.

The health agency and water supplier may, at their discretion, require an industrial water user to designate a user supervisor when the water user's premises has a multipiping system that convey various types of fluids, some of which may be hazardous and where changes in the piping system are frequently made. The user supervisor shall be responsible for the avoidance of cross-connections during the installation, operation and maintenance of the water user's pipelines and equipment.

Article 2. Protection of Water System.

§7601. Approval of backflow preventers.

Backflow preventers required by this Chapter shall have passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated their competency to perform such tests to the Department.

§7602. Construction of backflow preventers.

(a) Air-gap Separation. An Air-gap separation (AG) shall be at least double the diameter of the supply pipe, measured vertically from the flood rim of the receiving vessel to the supply pipe; however, in no case shall this separation be less than one inch.

(b) Double Check Valve Assembly. A required double check valve assembly (DC) shall, as a minimum, conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Double Check Valve Type Backflow Preventive Devices which is herein incorporated by reference.

(c) Reduced Pressure Principle Backflow Prevention Device. A required reduced pressure principle backflow prevention device (RP) shall, as a minimum, conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Reduced Pressure Principle Type Backflow Prevention Devices which is herein incorporated by reference.

§7603. Location of backflow preventers.

(a) Air-gap Separation. An air-gap separation shall be located as close as practical to the user's connection and all piping between the user's connection and the receiving tank shall be entirely visible unless otherwise approved in writing by the water supplier and the health agency.

(b) Double Check Valve Assembly. A double check valve assembly shall be located as close as practical to the user's connection and shall be installed above grade, if possible, and in a manner where it is readily accessible for testing and maintenance.

(c) Reduced Pressure Principle Backflow Prevention Device. A reduced pressure principle backflow prevention device shall be located as close as practical to the user's connection and shall be installed a minimum of twelve inches (12") above grade and not more than thirty-six inches (36") above grade measured from the bottom of the device and with a minimum of twelve inches (12") side clearance.

§7604. Type of protection required.

The type of protection that shall be provided to prevent backflow into the public water supply shall be commensurate with the degree of hazard that exists on the consumer's premises. The type of protective device that may be required (listed in an increasing level of protection) includes: Double check Valve Assembly--(DC), Reduced Pressure Principle Backflow Prevention Device--(RP) and an Air gap Separation--(AG). The water user may choose a higher level of protection than required by the water supplier. The minimum types of backflow protection required to protect the public water supply, at the water user's connection to premises with various degrees of hazard, are given in Table 1. Situations not covered in Table 1 shall be evaluated on a case-by-case basis and the

appropriate backflow protection shall be determined by the water supplier or health agency.

TABLE 1
TYPE OF BACKFLOW PROTECTION REQUIRED

Degree of Hazard	Minimum Type of Backflow Prevention
(a) Sewage and Hazardous Substances	
(1) Premises where there are waste water pumping and/or treatment plants and there is no interconnection with the potable water system. This does not include a single-family residence that has a sewage lift pump. A RP be provided in lieu of an AG if approved by the health agency and water supplier.	AG
(2) Premises where hazardous substances are handled in any manner in which the substances may enter the potable water system. This does not include a single-family residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and water supplier.	AG
(3) Premises where there are irrigation systems into which fertilizers, herbicides, or pesticides are, or can be, injected.	RP
(b) Auxiliary Water Supplies	
(1) Premises where there is an unapproved auxiliary water supply which is interconnected with the public water system. A RP or DC may be provided in lieu of an AG if approved by the health agency and water supplier	AG
(2) Premises where there is an unapproved auxiliary RP water supply and there are no interconnections with the public water system. A DC may be provided in lieu of a RP if approved by the health agency and water supplier.	RP
(c) Recycled water	
(1) Premises where the public water system is used to supplement the recycled water supply.	AG
(2) Premises where recycled water is used, other than as allowed in paragraph (3), and there is no interconnection with the potable water system.	RP
(3) Residences using recycled water for landscape irrigation as part of an approved dual plumbed use area established pursuant to sections 60313 through 60316 unless the recycled water supplier obtains approval of the	DC

local public water supplier, or the Department if the water supplier is also the supplier of the recycled water, to utilize an alternative backflow protection plan that includes an annual inspection and annual shutdown test of the recycled water and potable water systems pursuant to subsection 60316(a).

(d) Fire Protection Systems

(1) Premises where the fire system is directly supplied from the public water system and there is an unapproved auxiliary water supply on or to the premises (not interconnected). DC

(2) Premises where the fire system is supplied from the public water system and interconnected with an unapproved auxiliary water supply. A RP may be provided in lieu of an AG if approved by the health agency and water supplier. AG

(3) Premises where the fire system is supplied from the public water system and where either elevated storage tanks or fire pumps which take suction from private reservoirs or tanks are used. DC

(4) Premises where the fire system is supplied from the public water system and where recycled water is used in a separate piping system within the same building. DC

(e) Dockside Watering Points and Marine Facilities

(1) Pier hydrants for supplying water to vessels for any purpose. RP

(2) Premises where there are marine facilities. RP

(f) Premises where entry is restricted so that inspections for cross-connections cannot be made with sufficient frequency or at sufficiently short notice to assure that do not exist. RP

(g) Premises where there is a repeated history of crossconnections being established or re-established. RP

§7605. Testing and maintenance of backflow preventers.

(a) The water supplier shall assure that adequate maintenance and periodic testing are provided by the water user to ensure their proper operation.

(b) Backflow preventers shall be tested by persons who have demonstrated their competency in testing of these devices to the water supplier or health agency.

(c) Backflow preventers shall be tested at least annually or more frequently if determined to be necessary by the health agency or water supplier. When devices are

found to be defective, they shall be repaired or replaced in accordance with the provisions of this Chapter.

(d) Backflow preventers shall be tested immediately after they are installed, relocated or repaired and not placed in service unless they are functioning as required.

(e) The water supplier shall notify the water user when testing of backflow preventers is needed. The notice shall contain the date when the test must be completed.

(f) Reports of testing and maintenance shall be maintained by the water supplier for a minimum of three years.

TITLE 22 CODE OF REGULATIONS

Division 4. Environmental Health

Chapter 1. Introduction

Article 1. Definitions

§60001. Department.
Whenever the term "department" is used in this division, it means the State Department of Health Services, unless otherwise specified.

§60003. Director.
Whenever the term "director" is used in this division, it means the Director, State Department of Health Services, unless otherwise specified.

Chapter 2. Regulations for the Implementation of the California Environmental Quality

Article 1. General Requirements and Categorical Exemptions

§60100. General requirements.
The Department of Health Services incorporates by reference the objectives, criteria, and procedures as delineated in Chapters 1, 2, 2.5, 2.6, 3, 4, 5, and 6, Division 13, Public Resources Code, Sections 21000 et seq., and the Guidelines for the Implementation of the California Environmental Quality Act, Title 14, Division 6, Chapter 3, California Administrative Code, Sections 15000 et seq.

§60101. Specific activities within categorical exempt classes.
The following specific activities are determined by the Department to fall within the classes of categorical exemptions set forth in Sections 15300 et seq. of Title 14 of the California Administrative Code:

(a) Class 1: Existing Facilities.

(1) Any interior or exterior alteration of water treatment units, water supply systems, and pump station buildings where the alteration involves the addition, deletion, or modification of mechanical, electrical, or hydraulic controls.

(2) Maintenance, repair, replacement, or reconstruction to any water treatment process units, including structures, filters, pumps, and chlorinators.

(b) Class 2: Replacement or Reconstruction.

(1) Repair or replacement of any water service connections, meters, and valves for backflow prevention, air release, pressure regulating, shut-off and blow-off or flushing.

(2) Replacement or reconstruction of any existing water supply distribution lines, storage tanks and reservoirs of substantially the same size.

(3) Replacement or reconstruction of any water wells, pump stations and related appurtenances.

(c) Class 3: New Construction of Small Structures.

(1) Construction of any water supply and distribution lines of less than sixteen inches in diameter, and related appurtenances.

(2) Construction of any water storage tanks and reservoirs of less than 100,000 gallon capacity.

(d) Class 4: Minor Alterations to Land.

(1) Minor alterations to land, water, or vegetation on any officially existing designated wildlife management areas or fish production facilities for the purpose of reducing the environmental potential for nuisances or vector production.

(2) Any minor alterations to highway crossings for water supply and distribution lines.

Chapter 3. Water Recycling Criteria

Article 1. Definitions.

§60301.050. 24-hour Composite Sample.

"24-hour Composite Sample" means an aggregate sample derived from no fewer than eight discrete samples collected at equal time intervals or collected proportional to the flow rate over the compositing period. The aggregate sample shall reflect the average source water quality covering the composite 24-hour sample period.

§60301.080. Added Tracer.

"Added Tracer" means a non-reactive substance, with measureable characteristics distinctly different from the receiving groundwater, intentionally added to the water applied at a Groundwater Replenishment Reuse Project (GRRP) for the purpose of being a tracer such that the tracer can be readily identified in the groundwater downgradient of the GRRP to determine the underground retention time of the applied water.

§60301.100. Approved laboratory.

"Approved laboratory" means a laboratory that has been certified by the Department to perform microbiological analyses pursuant to section 116390, Health and Safety Code.

§60301.160. Coagulated wastewater.

"Coagulated wastewater" means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated upstream from a filter by the addition of suitable floc-forming chemicals.

§60301.170. Conventional treatment.

"Conventional treatment" means a treatment chain that utilizes a sedimentation unit process between the coagulation and filtration processes and produces an effluent that meets the definition for disinfected tertiary recycled water.

§60301.180. Department.

"Department" means the California Department of Public Health or its successor with authority to regulate public water systems.

§60301.190. Diluent Water.

"Diluent Water" means water, meeting the diluent requirements of this Chapter, used for reducing the recycled municipal wastewater contribution over time.

§60301.200. Direct beneficial use.

"Direct beneficial use" means the use of recycled water that has been transported from the point of treatment or production to the point of use without an intervening discharge to waters of the State.

§60301.220. Disinfected secondary-2.2 recycled water.

"Disinfected secondary-2.2 recycled water" means recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period.

§60301.225. Disinfected secondary-23 recycled water.

"Disinfected secondary-23 recycled water" means recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period.

§60301.230. Disinfected tertiary recycled water.

"Disinfected tertiary recycled water" means a filtered and subsequently disinfected wastewater that meets the following criteria:

(a) The filtered wastewater has been disinfected by either:

(1) A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or

(2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

(b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

§60301.240. Drift.

"Drift" means the water that escapes to the atmosphere as water droplets from a cooling system.

§60301.245. Drift eliminator.

"Drift eliminator" means a feature of a cooling system that reduces to a minimum the generation of drift from the system.

§60301.250. Dual plumbed system.

"Dual plumbed system" or "dual plumbed" means a system that utilizes separate piping systems for recycled water and potable water within a facility and where the recycled water is used for either of the following purposes:

(a) To serve plumbing outlets (excluding fire suppression systems) within a building or

(b) Outdoor landscape irrigation at individual residences.

§60301.300. F-Specific bacteriophage MS-2.

"F-specific bacteriophage MS-2" means a strain of a specific type of virus that infects coliform bacteria that is traceable to the American Type Culture Collection (ATCC15597B1) and is grown on lawns of E. coli (ATCC 15597).

§60301.310. Facility.

"Facility" means any type of building or structure, or a defined area of specific use that receives water for domestic use from a public water system as defined in section 116275 of the Health and Safety Code.

§60301.320. Filtered wastewater.

"Filtered wastewater" means an oxidized wastewater that meets the criteria in subsection (a) or (b):

(a) Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:

(1) At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in traveling bridge automatic backwash filters; and

(2) So that the turbidity of the filtered wastewater does not exceed any of the following:

(A) An average of 2 NTU within a 24-hour period;

(B) 5 NTU more than 5 percent of the time within a 24-hour period; and

(C) 10 NTU at any time.

(b) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:

(1) 0.2 NTU more than 5 percent of the time within a 24-hour period; and

(2) 0.5 NTU at any time.

§60301.330. Food crops.

"Food crops" means any crops intended for human consumption.

§60301.370. Groundwater.

"Groundwater" means water below the land surface in a saturated zone.

§60301.390. Groundwater Replenishment Reuse Project or GRRP.

"Groundwater Replenishment Reuse Project" or "GRRP" means a project involving the planned use of recycled municipal wastewater that is operated for the purpose of replenishing a groundwater basin designated in the Water Quality Control Plan [as defined in Water Code section 13050(j)] for use as a source of municipal and domestic water supply.

§60301.400. Hose bib.
"Hose bib" means a faucet or similar device to which a common garden hose can be readily attached.

§60301.450. Indicator Compound.
"Indicator Compound" means an individual chemical in a GRRP's municipal wastewater that represents the physical, chemical, and biodegradable characteristics of a specific family of trace organic chemicals; is present in concentrations that provide information relative to the environmental fate and transport of those chemicals; may be used to monitor the efficiency of trace organic compounds removal by treatment processes; and provides an indication of treatment process failure.

§60301.455. Intrinsic Tracer.
"Intrinsic Tracer" means a substance or attribute present in the recharge water at levels different from the receiving groundwater such that the substance in the water applied at the GRRP can be distinctly and sufficiently detected in the groundwater downgradient of the GRRP to determine the underground retention time of the water.

§60301.550. Landscape impoundment.
"Landscape impoundment" means an impoundment in which recycled water is stored or used for aesthetic enjoyment or landscape irrigation, or which otherwise serves a similar function and is not intended to include public contact.

§60301.575. Maximum Contaminant Level or MCL.
"Maximum Contaminant Level" or "MCL" means the maximum permissible concentration of a contaminant established pursuant to sections 116275(c)(1) and (d) of the Health and Safety Code or established by the U.S. Environmental Protection Agency.

§60301.600. Modal contact time.
"Modal contact time" means the amount of time elapsed between the time that a tracer, such as salt or dye, is injected into the influent at the entrance to a chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber.

§60301.620. Nonrestricted recreational impoundment.
"Nonrestricted recreational impoundment" means an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.

§60301.625. Notification Level or NL.
"Notification Level" or "NL" means the concentration of a contaminant established by the Department pursuant to section 116455 of the Health and Safety Code.

§60301.630. NTU.

"NTU" (Nephelometric turbidity unit) means a measurement of turbidity as determined by the ratio of the intensity of light scattered by the sample to the intensity of incident light as measured by method 2130 B. in Standard Methods for the Examination of Water and Wastewater, 20th ed.; Eaton, A. D., Clesceri, L. S., and Greenberg, A. E., Eds; American Public Health Association: Washington, DC, 1995; p. 2-8.

§60301.650. Oxidized wastewater.

"Oxidized wastewater" means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

§60301.660. Peak dry weather design flow.

"Peak Dry Weather Design Flow" means the arithmetic mean of the maximum peak flow rates sustained over some period of time (for example three hours) during the maximum 24-hour dry weather period. Dry weather period is defined as periods of little or no rainfall.

§60301.670. Project Sponsor.

"Project Sponsor" means an entity subject to a Regional Water Quality Control Board's (Regional Board's) water recycling requirements for a Groundwater Replenishment Reuse Project (GRRP) and is, in whole or part, responsible for applying to the Regional Board for a permit, obtaining a permit, operation of a GRRP, and complying with the terms and conditions of the permit and the requirements of this Chapter.

§60301.680. Public Water System.

"Public Water System" has the same meaning as defined in section 116275(h) of the Health and Safety Code.

§60301.685. Recharge Water.

"Recharge Water" means recycled municipal wastewater, or the combination of recycled municipal wastewater and credited diluent water, which is utilized by a GRRP for groundwater replenishment.

§60301.690. Recycled Municipal Wastewater.

"Recycled Municipal Wastewater" means recycled water that is the effluent from the treatment of wastewater of municipal origin.

§60301.700. Recycled water agency.

"Recycled water agency" means the public water system, or a publicly or privately owned or operated recycled water system, that delivers or proposes to deliver recycled water to a facility.

§60301.705. Recycled Municipal Wastewater Contribution or RWC.

"Recycled Municipal Wastewater Contribution" or "RWC" means the fraction equal to the quantity of recycled municipal wastewater applied at the GRRP divided by the sum of the quantity of recycled municipal wastewater and credited diluent water.

§60301.710. Recycling plant.

"Recycling plant" means an arrangement of devices, structures, equipment, processes and controls which produce recycled water.

§60301.740. Regulatory agency.

"Regulatory agency" means the California Regional Water Quality Control Board(s) that have jurisdiction over the recycling plant and use areas.

§60301.750. Restricted access golf course.

"Restricted access golf course" means a golf course where public access is controlled so that areas irrigated with recycled water cannot be used as if they were part of a park, playground, or school yard and where irrigation is conducted only in areas and during periods when the golf course is not being used by golfers.

§60301.760. Restricted recreational impoundment.

"Restricted recreational impoundment" means an impoundment of recycled water in which recreation is limited to fishing, boating, and other non-body-contact water recreational activities.

§60301.770. Regional Board.

"Regional Board" means the Regional Water Quality Control Board.

§60301.780. Saturated Zone.

"Saturated Zone" means an underground region or regions in which all interstices in, between, and below natural geologic materials are filled with water, with the uppermost surface of the saturated zone being the water table.

§60301.800. Spray irrigation.

"Spray irrigation" means the application of recycled water from sprinklers to crops or vegetation.

§60301.810. Spreading Area.

"Spreading Area" means a natural or constructed impoundment with a depth equal to or less than its widest surface dimension used by a GRRP to replenish a groundwater basin with recharge water infiltrating and percolating through a zone that, in the absence of a GRRP, would be an unsaturated zone.

§60301.830. Standby unit process.
"Standby unit process" means an alternate unit process or an equivalent alternative process which is maintained in operable condition and which is capable of providing comparable treatment of the actual flow through the unit for which it is a substitute.

§60301.840. Subsurface Application.
"Subsurface Application" means the application of recharge water to a groundwater basin(s) by a means other than surface application.

§60301.850. Surface Application.
"Surface Application" means the application of recharge water to a spreading area.

§60301.855. Surrogate Parameter.
"Surrogate Parameter" means a measurable physical or chemical property that has been demonstrated to provide a direct correlation with the concentration of an indicator compound, can be used to monitor the efficiency of trace organic compounds removal by a treatment process, and/or provides an indication of a treatment process failure.

§60301.860. Total Nitrogen.
"Total Nitrogen" means the sum of concentrations of ammonia, nitrite, nitrate, and organic nitrogen-containing compounds, expressed as nitrogen.

§60301.870. Total Organic Carbon or TOC.
"Total Organic Carbon" or "TOC" means the concentration of organic carbon present in water.

§60301.900. Undisinfected secondary recycled water.
"Undisinfected secondary recycled water" means oxidized wastewater.

§60301.910. Unsaturated Zone.
"Unsaturated Zone" means the volume between the land surface and the uppermost saturated zone.

§60301.920. Use area.
"Use area" means an area of recycled water use with defined boundaries. A use area may contain one or more facilities.

Article 2. Sources of Recycled Water.

§60302. Source specifications.

The requirements in this chapter shall only apply to recycled water from sources that contain domestic waste, in whole or in part.

Article 3. Uses of Recycled Water.

§60303. Exceptions.

The requirements set forth in this chapter shall not apply to the use of recycled water onsite at a water recycling plant, or wastewater treatment plant, provided access by the public to the area of onsite recycled water use is restricted.

§60304. Use of recycled water for irrigation.

(a) Recycled water used for the surface irrigation of the following shall be a disinfected tertiary recycled water, except that for filtration pursuant to Section 60301.320(a) coagulation need not be used as part of the treatment process provided that the filter effluent turbidity does not exceed 2 NTU, the turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes:

(1) Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop,

(2) Parks and playgrounds,

(3) School yards,

(4) Residential landscaping,

(5) Unrestricted access golf courses, and

(6) Any other irrigation use not specified in this section and not prohibited by other sections of the California Code of Regulations.

(b) Recycled water used for the surface irrigation of food crops where the edible portion is produced above ground and not contacted by the recycled water shall be at least disinfected secondary-2.2 recycled water.

(c) Recycled water used for the surface irrigation of the following shall be at least disinfected secondary-23 recycled water:

(1) Cemeteries,

(2) Freeway landscaping,

(3) Restricted access golf courses,

(4) Ornamental nursery stock and sod farms where access by the general public is not restricted,

(5) Pasture for animals producing milk for human consumption, and

(6) Any nonedible vegetation where access is controlled so that the irrigated area cannot be used as if it were part of a park, playground or school yard

(d) Recycled wastewater used for the surface irrigation of the following shall be at least undisinfected secondary recycled water:

(1) Orchards where the recycled water does not come into contact with the edible portion of the crop,

(2) Vineyards where the recycled water does not come into contact with the edible portion of the crop,

(3) Non food-bearing trees (Christmas tree farms are included in this category provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting or allowing access by the general public),

(4) Fodder and fiber crops and pasture for animals not producing milk for human consumption,

(5) Seed crops not eaten by humans,

(6) Food crops that must undergo commercial pathogen-destroying processing before being consumed by humans, and

(7) Ornamental nursery stock and sod farms provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting, retail sale, or allowing access by the general public.

(e) No recycled water used for irrigation, or soil that has been irrigated with recycled water, shall come into contact with the edible portion of food crops eaten raw by humans unless the recycled water complies with subsection (a).

§60305. Use of recycled water for impoundments.

(a) Except as provided in subsection (b), recycled water used as a source of water supply for nonrestricted recreational impoundments shall be disinfected tertiary recycled water that has been subjected to conventional treatment.

(b) Disinfected tertiary recycled water that has not received conventional treatment may be used for nonrestricted recreational impoundments provided the recycled water is monitored for the presence of pathogenic organisms in accordance with the following:

(1) During the first 12 months of operation and use the recycled water shall be sampled and analyzed monthly for *Giardia*, enteric viruses, and *Cryptosporidium*. Following the first 12 months of use, the recycled water shall be sampled and analyzed quarterly for *Giardia*, enteric viruses, and *Cryptosporidium*. The ongoing monitoring may be discontinued after the first two years of operation with the approval of the

department. This monitoring shall be in addition to the monitoring set forth in section 60321.

(2) The samples shall be taken at a point following disinfection and prior to the point where the recycled water enters the use impoundment. The samples shal be analyzed by an approved laboratory and the results submitted quarterly to the regulatory agency.

(c) The total coliform bacteria concentrations in recycled water used for nonrestricted recreational impoundments, measured at a point between the disinfection process and the point of entry to the use impoundment, shall comply with the criteria specified in section 60301.230 (b) for disinfected tertiary recycled water.

(d) Recycled water used as a source of supply for restricted recreational impoundments and for any publicly accessible impoundments at fish hatcheries shall be at least disinfected secondary-2.2 recycled water.

(e) Recycled water used as a source of supply for landscape impoundments that do not utilize decorative fountains shall be at least disinfected secondary-23 recycled water.

§60306. Use of recycled water for cooling.

(a) Recycled water used for industrial or commercial cooling or air conditioning that involves the use of a cooling tower, evaporative condenser, spraying or any mechanism that creates a mist shall be a disinfected tertiary recycled water.

(b) Use of recycled water for industrial or commercial cooling or air conditioning that does not involve the use of a cooling tower, evaporative condenser, spraying, or any mechanism that creates a mist shall be at least disinfected secondary-23 recycled water.

(c) Whenever a cooling system, using recycled water in conjunction with an air conditioning facility, utilizes a cooling tower or otherwise creates a mist that could come into contact with employees or members of the public, the cooling system shall comply with the following:

(1) A drift eliminator shall be used whenever the cooling system is in operation.

(2) A chlorine, or other, biocide shall be used to treat the cooling system recirculating water to minimize the growth of *Legionella* and other microorganisms.

§60307. Use of recycled water for other purposes.

(a) Recycled water used for the following shall be disinfected tertiary recycled water, except that for filtration being provided pursuant to Section 60301.320(a) coagulation need not be used as part of the treatment process provided that the filter effluent turbidity does not exceed 2 NTU, the turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and

never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes:

(1) Flushing toilets and urinals,
(2) Priming drain traps,
(3) Industrial process water that may come into contact with workers,
(4) Structural fire fighting,
(5) Decorative fountains,
(6) Commercial laundries,
(7) Consolidation of backfill around potable water pipelines,
(8) Artificial snow making for commercial outdoor use, and
(9) Commercial car washes, including hand washes if the recycled water is not heated, where the general public is excluded from the washing process.

(b) Recycled water used for the following uses shall be at least disinfected secondary-23 recycled water:

(1) Industrial boiler feed,
(2) Nonstructural fire fighting,
(3) Backfill consolidation around nonpotable piping,
(4) Soil compaction,
(5) Mixing concrete,
(6) Dust control on roads and streets,
(7) Cleaning roads, sidewalks and outdoor work areas and
(8) Industrial process water that will not come into contact with workers.

(c) Recycled water used for flushing sanitary sewers shall be at least undisinfected secondary recycled water.

Article 4. Use Area Requirements.

§60310. Use area requirements.

(a) No irrigation with disinfected tertiary recycled water shall take place within 50 feet of any domestic water supply well unless all of the following conditions have been met:

(1) A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from and the ground surface.
(2) The well contains an annular seal that extends from the surface into the aquitard.
(3) The well is housed to prevent any recycled water spray from coming into contact with the wellhead facilities.

(4) The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well.

(5) The owner of the well approves of the elimination of the buffer zone requirement.

(b) No impoundment of disinfected tertiary recycled water shall occur within 100 feet of any domestic water supply well.

(c) No irrigation with, or impoundment of, disinfected secondary-2.2 or disinfected secondary-23 recycled water shall take place within 100 feet of any domestic water supply well.

(d) No irrigation with, or impoundment of, undisinfected secondary recycled water shall take place within 150 feet of any domestic water supply well.

(e) Any use of recycled water shall comply with the following:

(1) Any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.

(2) Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.

(3) Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff.

(f) No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or school yard.

(g) All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording : "RECYCLED WATER - DO NOT DRINK". Each sign shall display an international symbol similar to that shown in figure 60310-A. The Department may accept alternative signage and wording, or an educational program, provided the applicant demonstrates to the Department that the alternative approach will assure an equivalent degree of public notification.

(h) Except as allowed under section 7604 of title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water.

(i) Except for use in a cemetery that complies with the requirements of section 8118 of the Health and Safety Code, the portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibs. Only

quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.

Water Recycling Criteria

FIGURE 60310-A

Article 5. Dual Plumbed Recycled Water Systems.

§60313. General requirements.

(a) No person other than a recycled water agency shall deliver recycled water to a dual plumbed facility.

(b) Except as allowed pursuant to section 13553(d) of the Water Code, a recycled water agency shall not deliver recycled water for any internal use to any individually-owned residential units including free-standing structures, multiplexes, or condominiums.[1]

(c) No recycled water agency shall deliver recycled water for internal use except for fire suppression systems, to any facility that produces or processes food products or beverages. For purposes of this Subsection, cafeterias or snack bars in a facility whose primary function does not involve the production or processing of foods or beverages are not considered facilities that produce or process foods or beverages.

(d) No recycled water agency shall deliver recycled water to a facility using a dual plumbed system unless the report required pursuant to section 13522.5 of the Water Code, and which meets the requirements set forth in section 60314, has been submitted to, and approved by, the regulatory agency.

§60314. Report submittal.

(a) For dual-plumbed recycled water systems, the report submitted pursuant to section13522.5 of the Water Code shall contain the following information in addition to the information required by section 60323:

(1) A detailed description of the intended use area identifying the following:

(A) The number, location, and type of facilities within the use area proposing to use dual plumbed systems,

(B) The average number of persons estimated to be served by each facility on a daily basis,

(C) The specific boundaries of the proposed use area including a map showing the location of each facility to be served,

(D) The person or persons responsible for operation of the dual plumbed system at each facility, and

(E) The specific use to be made of the recycled water at each facility.

(2) Plans and specifications describing the following:

(A) Proposed piping system to be used,

(B) Pipe locations of both the recycled and potable systems,

[1] AB 1406, Chapter 537, Statutes of 2007, Water Code 13553, et seq., allows condominiums to be plumbed with recycled water, subject to a number of provisions.

(C) Type and location of the outlets and plumbing fixtures that will be accessible to the public, and

(D) The methods and devices to be used to prevent backflow of recycled water into the public water system.

(3) The methods to be used by the recycled water agency to assure that the installation and operation of the dual plumbed system will not result in cross connections between the recycled water piping system and the potable water piping system. This shall include a description of pressure, dye or other test methods to be used to test the system every four years.

(b) A master plan report that covers more than one facility or use site may be submitted provided the report includes the information required by this section. Plans and specifications for individual facilities covered by the report may be submitted at any time prior to the delivery of recycled water to the facility.

§60315. Design requirements.

The public water supply shall not be used as a backup or supplemental source of water for a dual-plumbed recycled water system unless the connection between the two systems is protected by an air gap separation which complies with the requirements of sections 7602 (a) and 7603 (a) of title 17, California Code of Regulations, and the approval of the public water system has been obtained.

§60316. Operation requirements.

(a) Prior to the initial operation of the dual-plumbed recycled water system and annually thereafter, the Recycled Water Agency shall ensure that the dual plumbed system within each facility and use area is inspected for possible cross connections with the potable water system. The recycled water system shall also be tested for possible cross connections at least once every four years. The testing shall be conducted in accordance with the method described in the report submitted pursuant to section 60314. The inspections and the testing shall be performed by a cross connection control specialist certified by the California-Nevada section of the American Water Works Association or an organization with equivalent certification requirements. A written report documenting the result of the inspection or testing for the prior year shall be submitted to the department within 30 days following completion of the inspection or testing.

(b) The recycled water agency shall notify the department of any incidence of backflow from the dual-plumbed recycled water system into the potable water system within 24 hours of the discovery of the incident.

(c) Any backflow prevention device installed to protect the public water system serving the dual-plumbed recycled water system shall be inspected and maintained in accordance with section 7605 of Title 17, California Code of Regulations.

Article 5.1. Indirect Potable Reuse: Groundwater Replenishment – Surface Application.

~~§60320. Groundwater recharge.~~ ***(repealed)***

~~(a) Reclaimed water used for groundwater recharge of domestic water supply aquifers by surface spreading shall be at all times of a quality that fully protects public health. The State Department of Health Services' recommendations to the Regional Water Quality Control Boards for proposed groundwater recharge projects and for expansion of existing projects will be made on an individual case basis where the use of reclaimed water involves a potential risk to public health.~~

~~(b) The State Department of Health Services' recommendations will be based on all relevant aspects of each project, including the following factors: treatment provided; effluent quality and quantity; spreading area operations; soil characteristics; hydrogeology; residence time; and distance to withdrawal.~~

~~(c) The State Department of Health Services will hold a public hearing prior to making the final determination regarding the public health aspects of each groundwater recharge project. Final recommendations will be submitted to the Regional Water Quality Control Board in an expeditious manner.~~

§60320.100. General Requirements.

(a) The requirements of this Article apply to Groundwater Replenishment Reuse Projects (GRRPs) utilizing surface application, which receive initial permits from the Regional Board after June 18, 2014. Within 12 months after June 18, 2014, a project sponsor for a GRRP permitted on or before June 18, 2014, shall submit a report to the Department and appropriate Regional Board assessing its compliance with the requirements of this Article. For each requirement considered noncompliant and applicable by the Department or Regional Board, a project sponsor shall submit a schedule to the Department and Regional Board, for demonstrating and/or achieving compliance with the applicable requirements of this Article. Unless directed otherwise by the Department, a project sponsor's report for a GRRP permitted on or before June 18, 2014, need not assess compliance with requirements of this Article that are required to be met prior to operation of a GRRP, except subsection (b) of this section. The report is subject to review and approval by the Department and Regional Board.

(b) Prior to operation of a GRRP, the GRRP's project sponsor shall obtain Department approval of a plan describing the steps a project sponsor will take to provide an alternative source of drinking water supply to all users of a producing drinking water well, or a Department-approved treatment mechanism a project sponsor will provide to all owners of a producing drinking water well, that as a result of the GRRP's operation, as determined by the Department:

(1) violates a California or federal drinking water standard;

(2) has been degraded to the degree that it is no longer a safe source of drinking water; or

(3) receives water that fails to meet section 60320.108.

(c) Prior to operating a GRRP, a project sponsor shall collect at least four samples, at least one sample each quarter, from each potentially affected aquifer. The samples shall be representative of water in each aquifer, taking into consideration seasonal variations, and be analyzed for the chemicals, contaminants, and characteristics pursuant to sections 60320.110, 60320.112, 60320.118, and 60320.120.

(d) A GRRP's recycled municipal wastewater shall be retained underground for a period of time no less than the retention time required pursuant to sections 60320.108 and 60320.124. The GRRP shall be designed and operated in a manner that ensures water treated pursuant to this Article, beyond the boundary described in subsection (e)(2), meets the recycled municipal wastewater contributions (RWC) requirements in section 60320.116.

(e) Based on hydrogeologic flowpaths, a GRRP's project sponsor shall provide the Department, Regional Board, and local well-permitting authorities a map of the GRRP site at a scale of 1:24,000 or larger (1 inch equals 2,000 feet or 1 inch equals less than 2,000 feet) or, if necessary, a site sketch at a scale providing more detail, that clearly indicates the criteria in paragraphs (1) – (4) below. A revised map shall be prepared and provided when conditions change such that the previous map no longer accurately reflects current conditions.

(1) the location and boundaries of the GRRP;

(2) a boundary representing a zone of controlled drinking water well construction, the greatest of the horizontal and vertical distances reflecting the retention times required pursuant to sections 60320.108 and 60320.124;

(3) a secondary boundary representing a zone of potential controlled drinking water well construction, depicting the zone within which a well would extend the boundary in paragraph (2) to include existing or potential future drinking water wells, thereby requiring further study and potential mitigating activities prior to drinking water well construction; and

(4) the location of all monitoring wells established pursuant to section 60320.126, and drinking water wells within two years travel time of the GRRP based on groundwater flow directions and velocities expected under GRRP operating conditions.

(f) Prior to operating a GRRP, a project sponsor shall demonstrate to the Department and Regional Board that a project sponsor possesses adequate managerial and technical capability to assure compliance with this Article.

(g) Prior to replenishing a groundwater basin or an aquifer with recycled municipal wastewater, a GRRP's project sponsor shall demonstrate that all treatment processes have been installed and can be operated by a project sponsor to achieve their intended function. A protocol describing the actions to be taken to meet this subsection shall be included in the engineering report submitted pursuant section 60323.

(h) In the engineering report required pursuant to section 60323, a project sponsor for a GRRP shall include a hydrogeological assessment of the proposed GRRP's setting. The assessment shall include the following:

(1) the qualifications of the individual(s) preparing the assessment;

(2) a general description of geologic and hydrogeological setting of the groundwater basin(s) potentially directly impacted by the GRRP;

(3) a detailed description of the stratigraphy beneath the GRRP, including the composition, extent, and physical properties of the affected aquifers; and

(4) based on at least four rounds of consecutive quarterly monitoring to capture seasonal impacts;

(A) the existing hydrogeology and the hydrogeology anticipated as a result of the operation of the GRRP, and

(B) maps showing quarterly groundwater elevation contours, along with vector flow directions and calculated hydraulic gradients.

(i) If a project sponsor fails to complete compliance monitoring required pursuant to this Article, the Regional Board may determine water quality-related compliance based on available data.

(j) A project sponsor shall ensure that the recycled municipal wastewater used for a GRRP shall be from a wastewater management agency that is not in violation of the effluent limits pertaining to groundwater replenishment pursuant to this Article, as established in the wastewater management agency's Regional Board permit.

(k) If a project sponsor has been directed by the Department or Regional Board to suspend surface application pursuant to this Article, surface application shall not resume until the project sponsor has obtained Department and Regional Board approval.

§60320.102. Public Hearing.

(a) A public hearing for a GRRP shall be held by a project sponsor prior to the Department's submittal of its recommendations to the Regional Board for the GRRP's

initial permit and any time an increase in maximum RWC has been proposed but not addressed in a prior public hearing. Prior to a public hearing conducted pursuant to this section, a project sponsor shall provide the Department, for its review and approval, the information a project sponsor intends to present at the hearing. Following the Department's approval of the information, a project sponsor shall place the information on a project sponsor's Web site and in a repository that provides at least 30 days of public access to the information prior to the public hearing.

(b) Prior to placing the information required pursuant to subsection (a) in a repository, a project sponsor shall:

(1) Notify the public of the following;

(A) the location and hours of operation of the repository,

(B) the Internet address where the information may be viewed,

(C) the purpose of the repository and public hearing,

(D) the manner in which the public can provide comments, and

(E) the date, time, and location of the public hearing; and

(2) At a minimum, notify the first downgradient drinking water well owner and well owners whose drinking water well is within 10 years from the GRRP based on groundwater flow directions and velocities.

(c) Unless directed otherwise by the Department, the public notification made pursuant to subsection (b)(2) shall be by direct mail and the notification made pursuant to subsection (b)(1) shall be delivered in a manner to reach persons whose source of drinking water may be impacted by the GRRP, using one or more of the following methods:

(1) local newspaper(s) publication of general circulation;

(2) mailed or direct delivery of a newsletter;

(3) conspicuously placed statement in water bills; and/or

(4) television and/or radio.

§60320.104. Lab Analyses.

(a) Analyses for contaminants having primary or secondary MCLs shall be performed by laboratories approved to perform such analyses by the Department utilizing Department-approved drinking water methods.

(b) Analyses for chemicals other than those having primary or secondary MCLs shall be described in the GRRP's Operation Optimization Plan prepared pursuant to section 60320.122.

§60320.106. Wastewater Source Control.

A project sponsor shall ensure that the recycled municipal wastewater used for a GRRP shall be from a wastewater management agency that:

(a) administers an industrial pretreatment and pollutant source control program; and

(b) implements and maintains a source control program that includes, at a minimum;

(1) an assessment of the fate of Department-specified and Regional Board-specified chemicals and contaminants through the wastewater and recycled municipal wastewater treatment systems,

(2) chemical and contaminant source investigations and monitoring that focuses on Department-specified and Regional Board-specified chemicals and contaminants,

(3) an outreach program to industrial, commercial, and residential communities within the portions of the sewage collection agency's service area that flows into the water reclamation plant subsequently supplying the GRRP, for the purpose of managing and minimizing the discharge of chemicals and contaminants at the source, and

(4) a current inventory of chemicals and contaminants identified pursuant to this section, including new chemicals and contaminants resulting from new sources or changes to existing sources, that may be discharged into the wastewater collection system.

§60320.108. Pathogenic Microorganism Control.

(a) A project sponsor shall design and operate a GRRP such that the recycled municipal wastewater used as recharge water for a GRRP receives treatment that achieves at least 12-log enteric virus reduction, 10-log Giardia cyst reduction, and 10-log Cryptosporidium oocyst reduction. The treatment train shall consist of at least three separate treatment processes. Except as provided in subsection (c), for each pathogen (i.e., virus, Giardia cyst, or Cryptosporidium oocyst), a separate treatment process may be credited with no more than 6-log reduction, with at least three processes each being credited with no less than 1.0-log reduction.

(b) At a minimum, the recycled municipal wastewater applied at a GRRP shall receive treatment that meets:

(1) the definition of filtered wastewater, pursuant to section 60301.320; and

(2) the definition of disinfected tertiary recycled water, pursuant to section 60301.230.

(c) For each month retained underground as demonstrated in subsection (e), the recycled municipal wastewater or recharge water will be credited with 1-log virus reduction. A GRRP meeting subsections (b)(1) and (2) or providing advanced treatment in accordance with section 60320.201 for the entire flow of the recycled municipal wastewater used for groundwater replenishment, that also demonstrates at least six months retention underground pursuant to subsection (e), will be credited with 10-log Giardia cyst reduction and 10-log Cryptosporidium oocyst reduction.

(d) With the exception of log reduction credited pursuant to subsection (c), a project sponsor shall validate each of the treatment processes used to meet the requirements in subsection (a) for their log reduction by submitting a report for the Department's review and approval, or by using a challenge test approved by the Department, that provides evidence of the treatment process's ability to reliably and consistently achieve the log reduction. The report and/or challenge test shall be prepared by an engineer licensed in California with at least five years of experience, as a licensed engineer, in wastewater treatment and public water supply, including the evaluation of treatment processes for pathogen control. With the exception of retention time underground and a soil-aquifer treatment process, a project sponsor shall propose and include in its Operation Optimization Plan prepared pursuant to section 60320.122, on-going monitoring using the pathogenic microorganism of concern or a microbial, chemical, or physical surrogate parameter(s) that verifies the performance of each treatment process's ability to achieve its credited log reduction.

(e) To demonstrate the retention time underground in subsection (c), a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point. A project sponsor for a GRRP shall initiate the tracer study prior to the end of the third month of operation. A project sponsor for a GRRP permitted on or before June 18, 2014, that has not already performed such a tracer study shall complete a tracer study demonstrating the retention time underground. With Department approval, an intrinsic tracer may be used in lieu of an added tracer, with no more credit provided than the corresponding virus log reduction in column 2 of Table 60320.108.

(f) For the purpose of siting a GRRP location during project planning and until a GRRP's project sponsor has met the requirements of subsection (e), for each month of retention time estimated using the method in column 1, the recycled municipal wastewater or recharge water shall be credited with no more than the corresponding virus log reduction in column 2 of Table 60320.108.

Table 60320.108

Column 1	Column 2
Method used to estimate the retention time to the nearest downgradient drinking water well	**Virus Log Reduction Credit per Month**
Tracer study utilizing an added tracer.[1]	1.0 log
Tracer study utilizing an intrinsic tracer.[1]	0.67 log
Numerical modeling consisting of calibrated finite element or finite difference models using validated and verified computer codes used for simulating groundwater flow.	0.50 log
Analytical modeling using existing academically-accepted equations such as Darcy's Law to estimate groundwater flow conditions based on simplifying aquifer assumptions.	0.25 log

[1] The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point.

(g) A project sponsor shall obtain Department approval for the protocol(s) to be used to establish the retention times in subsections (e) and (f).

(h) Based on changes in hydrogeological or climatic conditions since the most recent demonstration, the Department may require a GRRP's project sponsor to demonstrate that the underground retention times required in this section are being met.

(i) If a pathogen reduction in subsection (a) is not met based on the on-going monitoring required pursuant to subsection (d), within 24 hours of being aware a project sponsor shall immediately investigate the cause and initiate corrective actions. The project sponsor shall immediately notify the Department and Regional Board if the GRRP fails to meet the pathogen reduction criteria longer than 4 consecutive hours, or more than a total of 8 hours during any 7-day period. Failures of shorter duration shall be reported to the Regional Board by a project sponsor no later than 10 days after the month in which the failure occurred.

(j) If the effectiveness of a treatment train's ability to reduce enteric virus is less than 10-logs, or Giardia cyst or Cryptosporidium oocyst reduction is less than 8-logs, a project sponsor shall immediately notify the Department and Regional Board, and discontinue application of recycled municipal wastewater at the GRRP, unless directed otherwise by the Department or Regional Board.

§60320.110. Nitrogen Compounds Control.

(a) To demonstrate control of the nitrogen compounds, a project sponsor shall:

(1) Each week, at least three days apart as specified in the GRRP's Operation Optimization Plan, collect at least two total nitrogen samples (grab or 24-hour composite) representative of the recycled municipal wastewater or recharge water applied throughout the spreading area. Samples may be collected before or after surface application;

(2) Have the samples collected pursuant to paragraph (1) analyzed for total nitrogen, with the laboratory being required by a project sponsor to complete each analysis within 72 hours and have the result reported to a project sponsor within the same 72 hours if the result of any single sample exceeds 10 mg/L;

(3) If the average of the results of two consecutive samples collected pursuant to paragraph (1) exceeds 10 mg/L total nitrogen;

(A) take a confirmation sample and notify the Department and the Regional Board within 48 hours of being notified of the results by the laboratory,

(B) investigate the cause for the exceedances and take actions to reduce the total nitrogen concentrations to ensure continued or future exceedances do not occur, and

(C) initiate additional monitoring for nitrogen compounds as described in the GRRP's Operation Optimization Plan, including locations in the groundwater basin and spreading area, to identify elevated concentrations and determine whether such elevated concentrations exceed or may lead to an exceedance of a nitrogen-based MCL; and

(4) If the average of the results of four consecutive samples collected pursuant to paragraph (1) exceeds 10 mg/L total nitrogen, suspend the surface application of recycled municipal wastewater. Surface application shall not resume until corrective actions have been taken and at least two consecutive total nitrogen sampling results are less than 10 mg/L.

(b) As determined by the Department and based on a GRRP's operation, including but not limited to the time the spreading area is out of service and utilization of a denitrification process, a project sponsor shall initiate additional monitoring for nitrogen compounds to identify elevated concentrations in the groundwater and determine whether such elevated concentrations exceed or may lead to an exceedance of a nitrogen-based MCL.

(c) Following Department and Regional Board approval, a project sponsor may initiate reduced monitoring frequencies for total nitrogen. A project sponsor may apply to the Department and Regional Board for reduced monitoring frequencies for total nitrogen if, for the most recent 24 months:

(1) the average of all results did not exceed 5 mg/L total nitrogen; and

(2) the average of a result and its confirmation sample (taken within 24 hours of receipt of the initial result) did not exceed 10 mg/L total nitrogen.

(d) If the results of reduced monitoring conducted as approved pursuant to subsection (c) exceed the total nitrogen concentration criteria in subsection (c), a project sponsor shall revert to the monitoring frequencies for total nitrogen prior to implementation of the reduced frequencies. Reduced frequency monitoring shall not resume unless the requirements of subsection (c) are met.

§60320.112. Regulated Contaminants and Physical Characteristics Control.

(a) Each quarter, as specified in the GRRP's Operation Optimization Plan, a project sponsor shall collect samples (grab or 24-hour composite) representative of the applied recycled municipal wastewater and have the samples analyzed for:

(1) the inorganic chemicals in Table 64431-A, except for nitrogen compounds;

(2) the radionuclide chemicals in Tables 64442 and 64443;

(3) the organic chemicals in Table 64444-A;

(4) the disinfection byproducts in Table 64533-A; and

(5) lead and copper.

(b) Recharge water (including recharge water after surface application) may be monitored in lieu of recycled municipal wastewater to satisfy the monitoring requirements in subsection (a)(4) if the fraction of recycled municipal wastewater in the recharge water is equal to or greater than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter. If the fraction of recycled municipal wastewater in the recharge water being monitored is less than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter, the reported value shall be adjusted to exclude the effects of dilution.

(c) Each year, the GRRP's project sponsor shall collect at least one representative sample (grab or 24-hour composite) of the recycled municipal wastewater or recharge

water and have the sample(s) analyzed for the secondary drinking water contaminants in Tables 64449-A and 64449-B.

(d) If a result of the monitoring performed pursuant to subsection (a) exceeds a contaminant's MCL or action level (for lead and copper), a project sponsor shall collect another sample within 72 hours of notification of the result and then have it analyzed for the contaminant as confirmation.

(1) For a contaminant whose compliance with its MCL or action level is not based on a running annual average, if the average of the initial and confirmation sample exceeds the contaminant's MCL or action level, or the confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP's project sponsor shall notify the Department and Regional Board within 24 hours and initiate weekly monitoring until four consecutive weekly results are below the contaminant's MCL or action level. If the running four-week average exceeds the contaminant's MCL or action level, the GRRP's project sponsor shall notify the Department and Regional Board within 24 hours and, if directed by the Department or Regional Board, suspend application of the recycled municipal wastewater.

(2) For a contaminant whose compliance with its MCL is based on a running annual average, if the average of the initial and confirmation sample exceeds the contaminant's MCL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the contaminant's MCL.

(A) If the running four-week average exceeds the contaminant's MCL, a project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to the Department and Regional Board no later than 45 days following the quarter in which the exceedance occurred.

(B) If the running four-week average exceeds the contaminant's MCL for sixteen consecutive weeks, a project sponsor shall notify the Department and Regional Board within 48 hours of knowledge of the exceedance and, if directed by the Department or Regional Board, suspend application of the recycled municipal wastewater.

(e) If the annual average of the results of the monitoring performed pursuant to subsection (c) exceeds a contaminant's secondary MCL in Table 64449-A or the upper limit in Table 64449-B, a project sponsor shall initiate quarterly monitoring of the recycled municipal wastewater for the contaminant and, if the running annual average of quarterly-averaged results exceeds a contaminant's secondary MCL or upper limit, describe the reason(s) for the exceedance and any corrective actions taken in a report submitted to Regional Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to the Department. The annual monitoring in subsection (c) may resume if the running annual average of quarterly results does not exceed a contaminant's secondary MCL or upper limit.

(f) If four consecutive quarterly results for asbestos are below the detection limit in Table 64432-A for asbestos, monitoring for asbestos may be reduced to one sample every three years. Quarterly monitoring shall resume if asbestos is detected.

§60320.114. Diluent Water Requirements.

To be credited with diluent water used in calculating an RWC pursuant to section 60320.116, the GRRP shall comply with the requirements of this section and receive Department approval. For diluent water that is a Department-approved drinking water source, the GRRP's project sponsor is exempt from subsections (a) and (b). The GRRP's project sponsor shall:

(a) Monitor the diluent water quarterly for nitrate and nitrite and, within 72 hours of being informed by the laboratory of a nitrate, nitrite, or nitrate plus nitrite result exceeding a maximum contaminant level (MCL), collect a confirmation sample. If the average of the two samples is greater than an MCL;

(1) notify the Department and the Regional Board within 48 hours of receiving the confirmation sample result,

(2) investigate the cause(s) and implement corrective actions, and

(3) each week, collect and analyze two grab samples at least three days apart as specified in the GRRP's Operation Optimization Plan. If the average of the results for a two-week period exceeds the MCL, surface application of the diluent water shall not be used in the calculation of RWC until corrective actions are made. Quarterly monitoring may resume if four consecutive results are below the MCL.

(b) Conduct a source water evaluation per the California-Nevada Section of American Water Works Association's Watershed Sanitary Survey Guidance Manual (1993), as it may be amended, or other Department-approved evaluation, of the diluent water for Department review and approval that includes, but is not limited to:

(1) a description of the source of the diluent water;

(2) delineation of the origin and extent of the diluent water;

(3) the susceptibility of the diluent water to contamination;

(4) the identification of known or potential contaminants; and

(5) an inventory of the potential sources of diluent water contamination.

(c) Ensure diluent water does not exceed a primary MCL, a secondary MCL upper limit (if not historically used to recharge the basin), or a notification level (NL), and implement a Department-approved water quality monitoring plan for Department-specified contaminants to demonstrate compliance with the primary MCLs, secondary MCLs (except turbidity, color, and odor), and NLs. The plan shall also include:

(1) except for Department-approved drinking water sources used as a diluent water, monitoring of any chemicals or contaminants required pursuant to section 60320.120, based on the source water evaluation performed in subsection (b); and

(2) actions to be taken in the event of non-compliance with a primary MCL, secondary MCL, or exceedance of a NL.

(d) Develop a method for determining the volume of diluent water to be credited and demonstrate that the diluent water will be introduced in a manner such that the diluent water volume will not result in the GRRP's 120-month running monthly average RWC exceeding its maximum RWC at or beyond the boundary established pursuant to section 60320.100(e)(2). The method shall be submitted to the Department for review and approval, and be conducted at a frequency specified in the engineering report prepared pursuant to section 60323. The method shall address all conditions that influence how and when the recycled municipal wastewater and diluent water arrive at all points along the boundary. The conditions must include, but are not limited to, temporal variability in the diluent water supply and regional groundwater gradients, the difference in the distribution of the recycled municipal wastewater and diluent water between individual aquifers where more than one aquifer is replenished, and the difference in travel-time when recycled municipal wastewater and diluent water are introduced at different locations and/or times.

(e) For credit prior to the operation of the GRRP, but not to exceed 120 months:

(1) demonstrate that the diluent water met the nitrate, nitrite, and nitrate plus nitrite MCLs, NLs, and the water quality requirements in section 60320.112;

(2) provide evidence that the quantity of diluent water has been accurately determined and was distributed such that the proposed or permitted maximum RWC would not have been exceeded; and

(3) conduct a source water evaluation of the diluent water pursuant to subsection (b).

(f) In the Operation Optimization Plan prepared pursuant to section 60320.122, include a description of:

(1) how the diluent water will be distributed in a manner that ensures that the maximum RWC will not be exceeded during normal operations; and

(2) the actions to be taken in the event the diluent water is curtailed or is no longer available.

(g) If approved by the Department, recharge water may be monitored in lieu of a diluent water source if the diluent water source cannot be monitored directly in a manner that provides samples representative of the diluent water being applied.

§60320.116. Recycled Municipal Wastewater Contribution (RWC) Requirements.

(a) Each month, for each surface application GRRP used for replenishing a groundwater basin, the GRRP's project sponsor shall calculate the running monthly average (RMA) RWC based on the total volume of the recycled municipal wastewater and credited diluent water for the preceding 120 months. For GRRPs in operation less than 120 months, calculation of the RMA RWC shall commence after 30 months of recycled municipal wastewater application, based on the total volume of the recycled municipal wastewater and credited diluent water introduced during the preceding months.

(b) The GRRP's RMA RWC, as determined in subsection (a), shall not exceed the maximum RWC specified for the GRRP by the Department.

(c) The initial maximum RWC shall not exceed 0.20 or an alternative initial RWC approved by the Department. An alternative initial RWC up to 1.0 may be approved by the Department based on, but not limited to, the Department's review of the engineering report, the information obtained as a result of the public hearing(s), and a project sponsor's demonstration that the treatment processes preceding the soil-aquifer treatment process will reliably achieve total organic carbon (TOC) concentrations no greater than 0.5 mg/L divided by the proposed initial RWC.

(d) A GRRP may increase its maximum RWC, provided:

(1) the increase has been approved by the Department and Regional Board;

(2) for the previous 52 weeks, the TOC 20-week running average, as monitored pursuant to section 62320.118, has not exceeded 0.5 mg/L divided by the proposed maximum RWC; and

(3) the GRRP has received a permit from the Regional Board that allows operation of the GRRP at the increased maximum RWC.

(e) In addition to the requirements in subsection (d), prior to operating a GRRP at an RWC greater than 0.50 or 0.75, which must be achieved sequentially, a project sponsor shall:

(1) provide a proposal to the Department prepared and signed by an engineer licensed in California with at least three years of experience in wastewater treatment and public water supply;

(2) submit an updated engineering report and Operation Optimization Plan; and

(3) provide evidence of compliance with section 60320.126(a).

(f) If the RMA RWC exceeds its maximum RWC, the GRRP's project sponsor shall:

(1) notify the Department and Regional Board in writing within seven days of knowledge of the exceedance; and

(2) within 60 days of knowledge of the exceedance, implement corrective action(s) and additional actions that may be required by the Department or Regional Board, and submit a report to the Department and Regional Board describing the reason(s) for the exceedance and the corrective action(s) taken to avoid future exceedances.

§60320.118. Total Organic Carbon (TOC) and Soil-Aquifer Treatment (SAT) Process Requirements.

For each surface application GRRP used for replenishing a groundwater basin, the GRRP's project sponsor shall assess the SAT process through the monitoring of TOC, indicator compounds, and surrogate parameters, as approved by the Department.

(a) At least once each week, a project sponsor shall analyze TOC from representative 24-hour composite samples of the following:

(1) the undiluted recycled municipal wastewater, prior to application or within the zone of percolation;

(2) the diluted percolated recycled municipal wastewater, with the value amended to negate the effect of the diluent water; or

(3) the undiluted recycled municipal wastewater prior to application, with the value amended using a soil-aquifer treatment factor approved by the Department and based on demonstration studies, which reliably predicts the removal efficiency of the process.

(b) Grab samples may be used in lieu of the 24-hour composite samples required in subsection (a) if:

(1) the GRRP demonstrates that a grab sample is representative of the water quality throughout a 24-hour period; or

(2) the entire recycled municipal wastewater stream has been treated by reverse osmosis meeting the criteria in sections 60320.201(a) and (b).

(c) Analytical results of the TOC monitoring performed pursuant to subsection (a) shall not exceed 0.5 mg/L divided by the RMA RWC based on:

(1) the 20-week running average of all TOC results; and

(2) the average of the last four TOC results.

(d) If the GRRP exceeds the limit in subsection (c)(1) or its approved increased TOC limit obtained pursuant to section 60320.130(c), based on a 20-week running average, a project sponsor shall take the following actions upon being notified of the results:

(1) immediately suspend the addition of recycled municipal wastewater until at least two consecutive results, three days apart, are less than the limit;

(2) notify the Department and Regional Board within seven days of suspension; and

(3) within 60 days, submit a report to the Department and Regional Board describing the reasons for the exceedance and the corrective actions to avoid future exceedances. At a minimum, the corrective actions shall include;

(A) a reduction of RWC sufficient to comply with the limit, and/or

(B) additional treatment demonstrated to the Department to remove TOC and chemicals or contaminants of concern to public health.

(e) If the GRRP exceeds the limit in subsection (c)(2) or its approved increased TOC limit obtained pursuant to section 60320.130(c), based on the average of the last four results, a project sponsor shall, within 60 days of being notified of the results, submit a report to the Department and Regional Board describing the reasons for the exceedance and the corrective actions taken to avoid future exceedances.

(f) Prior to a GRRP beginning initial operation and at five-year intervals thereafter, a project sponsor shall conduct a study to determine the occurrence of indicator compounds in the recycled municipal wastewater to be applied at the GRRP. Following completion of the study, a project sponsor shall propose at least three indicator compounds for use in meeting subsection (g). The protocol for the occurrence study, the study's results, and the indicator compounds to be used shall be reviewed and approved by the Department.

(g) Quarterly, a project sponsor shall monitor the GRRP's recycled municipal wastewater or recharge water prior to the SAT process and the water after the SAT process, but at a point no farther than 30 days downgradient of the spreading area. The monitoring shall include at least three indicator compounds based on the results of an occurrence study approved by the Department. If the monitoring results do not indicate a reduction of at least 90 percent in the concentration of indicator compounds by the SAT, excluding the effects of dilution from diluent water that may be present, a project sponsor shall investigate the reason for the low reduction and report the indicator compound and investigative results within 90 days of receipt of the analytical results.

(h) If the result of the investigation in subsection (g) concludes that the 90 percent reduction could not be demonstrated because the concentration of indicator compounds prior to the SAT process was not sufficient, a project sponsor shall consult with the Department and comply with an alternative monitoring plan approved by the Department. If a project sponsor demonstrates that there are not three compounds available and suitable for indicating a 90 percent reduction pursuant to subsection (g), a project sponsor may utilize an indicator compound that achieves a reduction less than 90 percent, with Department approval of the alternative indicator compound and reduction criteria.

(i) To use one or more wastewater chemicals in lieu of TOC, a project sponsor shall obtain approval from the Department. At a minimum, the chemical(s) used in lieu of TOC shall:

(1) be quantifiable in the wastewater, recycled municipal wastewater, groundwater, and throughout the treatment processes; and

(2) have identifiable treatment performance standards as protective of public health as the TOC standards in this Article.

§60320.120. Additional Chemical and Contaminant Monitoring.

(a) Each quarter, the GRRP's project sponsor shall sample and analyze the recycled municipal wastewater and the groundwater (from the downgradient monitoring wells established pursuant to section 60320.126) for the following:

(1) Priority Toxic Pollutants (chemicals listed in 40 CFR section 131.38, "Establishment of numeric criteria for priority toxic pollutants for the State of California," as the foregoing may be amended) specified by the Department, based on the Department's review of the GRRP's engineering report; and

(2) Chemicals that the Department has specified, based on a review of the GRRP's engineering report, the affected groundwater basin(s), and the results of the assessment performed pursuant to section 60320.106(b)(1).

(b) Each quarter, the GRRP's project sponsor shall sample and analyze the recycled municipal wastewater for Department-specified chemicals having notification levels (NLs). Recharge water (including recharge water after surface application) may be monitored in lieu of recycled municipal wastewater if the fraction of recycled municipal wastewater in the recharge water is equal to or greater than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter. If the fraction of recycled municipal wastewater in the recharge water being monitored is less than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter, the reported value shall be adjusted to exclude the effects of dilution. If a result exceeds a NL, within 72 hours of notification of the result a project sponsor shall collect another sample and have it analyzed for the contaminant as confirmation. If the average of the initial and confirmation sample exceeds the contaminant's NL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the NL.

(1) If the running four-week average exceeds the contaminant's NL, a project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to the Regional Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to the Department.

(2) If the running four-week average exceeds the contaminant's NL for sixteen consecutive weeks, a project sponsor shall notify the Department and Regional Board within 48 hours of knowledge of the exceedance.

(c) A project sponsor may reduce monitoring for the chemicals in this section to once each year following Department approval based on the Department's review of the most recent two years of results of the monitoring performed pursuant to this section.

(d) Annually, a project sponsor shall monitor the recycled municipal wastewater for indicator compounds specified by the Department and Regional Board based on the following:

(1) a review of the GRRP's engineering report;

(2) the inventory developed pursuant to section 60320.106(b)(4);

(3) the affected groundwater basin(s);

(4) an indicator compound's ability to characterize the presence of pharmaceuticals, endocrine disrupting chemicals, personal care products, and other indicators of the presence of municipal wastewater; and

(5) the availability of a test method for a chemical.

(e) A chemical or contaminant detected as a result of monitoring conducted pursuant to this section shall be reported to the Department and Regional Board no later than the quarter following the quarter in which the results are received by the GRRP's project sponsor.

§60320.122. Operation Optimization and Plan.

(a) Prior to operation of a GRRP, a project sponsor shall submit an Operation Optimization Plan to the Department and Regional Board for review and approval. At a minimum, the Operation Optimization Plan shall identify and describe the operations, maintenance, analytical methods, monitoring necessary for the GRRP to meet the requirements of this Article, and the reporting of monitoring results to the Department and Regional Board. A project sponsor shall be responsible for ensuring that the Operation Optimization Plan is, at all times, representative of the current operations, maintenance, and monitoring of the GRRP. A GRRP's project sponsor shall make the Operation Optimization Plan available to the Department or Regional Board for review upon request.

(b) During the first year of operation of a GRRP and at all times thereafter, all treatment processes shall be operated in a manner providing optimal reduction of all chemicals and contaminants including:

(1) microbial contaminants;

(2) regulated contaminants identified in section 60320.112 and the nitrogen compounds required pursuant to section 60320.110; and

(3) chemicals and contaminants required pursuant to section 60320.120.

(c) Within six months of optimizing treatment processes pursuant to subsection (b) and anytime thereafter operations are optimized that result in a change in operation, a

project sponsor shall update the GRRP's Operation Optimization Plan to include such changes in operational procedures and submit the operations plan to the Department for review.

§60320.124. Response Retention Time.

(a) The recycled municipal wastewater applied by a GRRP shall be retained underground for a period of time necessary to allow a project sponsor sufficient response time to identify treatment failures and implement actions, including those required pursuant to section 60320.100(b), necessary for the protection of public health.

(b) The response retention time required in subsection (a) must be approved by the Department, based on information provided in the engineering report required pursuant to section 60323. The response retention time shall be no less than two months.

(c) To demonstrate the retention time underground is no less than the response retention time approved pursuant to subsection (b), a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. With Department approval, an intrinsic tracer may be used in lieu of an added tracer. For each month of retention time estimated utilizing the approved intrinsic tracer, a project sponsor shall receive no more than 0.67 months credit. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reaches the monitoring point. A project sponsor for a GRRP shall initiate the tracer study prior to the end of the third month of operation. A project sponsor for a GRRP permitted on or before June 18, 2014, that has not performed a tracer study shall complete a tracer study demonstrating the retention time underground.

(d) For the purpose of siting a GRRP location during project planning and until a GRRP's project sponsor has met the requirements of subsection (c), for each month of retention time estimated using the method in column 1, the recycled municipal wastewater or recharge water may be credited with no more than the corresponding response time in column 2 of Table 60320.124.

Table 60320.124

Column 1	Column 2
Method used to estimate the retention time	**Response Time Credit per Month**
Tracer study utilizing an added tracer.[1]	1.0 month
Tracer study utilizing an intrinsic tracer.[1]	0.67 month
Numerical modeling consisting of calibrated finite element or finite difference models using validated and verified computer codes used for simulating groundwater flow.	0.50 month
Analytical modeling using existing academically-accepted equations such as Darcy's Law to estimate groundwater flow conditions based on simplifying aquifer assumptions.	0.25 month

[1] The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reaches the monitoring point.

(e) A project sponsor shall obtain Department approval for the protocol(s) to be used to establish the retention times in subsections (c) and (d).

(f) Upon request from the Department, a project sponsor shall demonstrate that the underground retention times required in this section are being met based on changes in hydrogeological or climatic conditions since the most recent demonstration.

§60320.126. Monitoring Well Requirements.

(a) Prior to operating a GRRP, a project sponsor shall site and construct at least two monitoring wells downgradient of the GRRP such that:

(1) at least one monitoring well is located;

(A) no less than two weeks but no more than six months of travel through the saturated zone affected by the GRRP, and

(B) at least 30 days upgradient of the nearest drinking water well;

(2) in addition to the well(s) in paragraph (1) and after consultation with the Department, at least one monitoring well is located between the GRRP and the nearest downgradient drinking water well; and

(3) samples from the monitoring wells in paragraphs (1) and (2) can be;

(A) obtained independently from each aquifer, initially receiving the water used as a source of drinking water supply, that will receive the GRRP's recharge water, and

(B) validated as receiving recharge water from the GRRP.

(b) In addition to the monitoring required pursuant to section 60320.120, from each monitoring well in subsection (a)(1), and each monitoring well in subsection (a)(2) that has recharge water located within one year travel time of the well(s), a project sponsor shall collect two samples prior to GRRP operation and at least one sample each quarter after operation begins. Each sample shall be analyzed for total nitrogen, nitrate, nitrite, the contaminants in Tables 64449-A and B of section 64449, and any contaminants and chemicals specified by the Department or Regional Board based on the results of the recycled municipal wastewater monitoring conducted pursuant to this Article.

(c) If a result from the monitoring conducted pursuant to subsection (b) exceeds 80 percent of a nitrate, nitrite, or nitrate plus nitrite MCL a project sponsor shall, within 48 hours of being notified of the result by the laboratory, collect another sample and have it analyzed for the contaminant. If the average of the result of the initial sample and the confirmation sample exceed the contaminant's MCL, a project sponsor shall:

(1) within 24 hours of being notified by the laboratory of the confirmation sample result, notify the Department and Regional Board; and

(2) discontinue surface application of recycled municipal wastewater until corrective actions have been taken or evidence is provided to the Department and Regional Board that the contamination was not a result of the GRRP.

(d) For Department-specified chemical analyses completed in a month, a project sponsor shall ensure the laboratory electronically submits results to the Department no later than 45 days after the end of the month in which monitoring occurred, in a manner such that data is readily uploaded into the Department's database. Utilization of the process described on the Department's Web site will satisfy this requirement.

(e) The GRRP's project sponsor may reduce monitoring for the chemicals and contaminants in subsection (b) to once each year following Department approval based on the Department's review of the most recent two years of monitoring results.

§60320.128. Reporting.

(a) No later than six months after the end of each calendar year, a project sponsor shall provide a report to the Department and Regional Board. Public water systems and drinking water well owners having downgradient sources potentially affected by the GRRP and within 10 years groundwater travel time from the GRRP shall be notified by direct mail and/or electronic mail of the availability of the report. The report shall be prepared by an engineer licensed in California and experienced in the fields of wastewater treatment and public water supply. The report shall include the following:

(1) A summary of the GRRP's compliance status with the monitoring requirements and criteria of this Article during the previous calendar year;

(2) For any violations of this Article during the previous calendar year;

(A) the date, duration, and nature of the violation,

(B) a summary of any corrective actions and/or suspensions of surface application of recycled municipal wastewater resulting from a violation, and

(C) if uncorrected, a schedule for and summary of all remedial actions;

(3) Any detections of monitored chemicals or contaminants, and any observed trends in the monitoring wells and diluent water supplies;

(4) Information pertaining to the vertical and horizontal migration of the recharge water plume;

(5) A description of any changes in the operation of any unit processes or facilities;

(6) A description of any anticipated changes, along with an evaluation of the expected impact of the changes on subsequent unit processes;

(7) The estimated quantity and quality of the recycled municipal wastewater and diluent water to be applied for the next calendar year;

(8) A summary of the measures taken to comply with section 60320.106 and 60320.100(j), and the effectiveness of the implementation of the measures; and

(9) Increases in RWC during the previous calendar year and RWC increases anticipated for the next calendar year.

(b) Every five years from the date of the initial approval of the engineering report required pursuant to section 60323, a project sponsor shall update the report to address any project changes and submit the report to the Department and Regional Board. The update shall include, but not be limited to:

(1) anticipated RWC increases, a description of how the RWC requirements in section 60320.116 will be met, and the expected impact the increase will have on the GRRP's ability to meet the requirements of this Article;

(2) evidence that the requirements associated with retention time in section 60320.108, if applicable, and section 60320.124 have been met; and

(3) a description of any inconsistencies between previous groundwater model predictions and the observed and/or measured values, as well as a description of how subsequent predictions will be accurately determined.

§60320.130. Alternatives.

(a) A project sponsor may use an alternative to a requirement in this Article if the GRRP's project sponsor:

(1) demonstrates to the Department that the proposed alternative assures at least the same level of protection to public health;

(2) receives written approval from the Department prior to implementation of the alternative; and

(3) if required by the Department or Regional Board, conducts a public hearing on the proposed alternative, disseminates information to the public, and receives public comments, pursuant to sections 60320.102(b) and (c).

(b) Unless specified otherwise by the Department, the demonstration in subsection (a)(1) shall include the results of a review of the proposed alternative by an independent scientific advisory panel that includes a toxicologist, a registered engineering geologist or hydrogeologist, an engineer licensed in California with at least three years of experience in wastewater treatment and public drinking water supply, a microbiologist, and a chemist.

(c) The TOC limit specified in section 60320.118(c) may be increased if:

(1) The increased TOC limit is approved by the Department and Regional Board;

(2) The GRRP has been in operation for the most recent ten consecutive years;

(3) A project sponsor submits a proposal to the Department prepared and signed by an engineer licensed in California with at least three years of experience in the fields of wastewater treatment and public water supply. The proposal shall include the following, based on the most recent ten consecutive years of operation;

(A) GRRP operations, monitoring, and compliance data,

(B) Evidence that the GRRP has a history of compliance with the requirements of their Regional Board permit,

(C) Evidence that the water collected at all downgradient drinking water wells and monitoring wells impacted by the GRRP has met the primary drinking water standards,

(D) Analytical or treatment studies requested by the Department to make the determination in subparagraph (C),

(E) Validation of appropriate construction and siting of monitoring wells pursuant to section 60320.126(a), and

(F) A study defining the water quality changes, including organic carbon characterization, as a result of the impact of the GRRP; and

(4) A project sponsor performs a health effects evaluation that assesses the health risks to consumers of water impacted by the GRRP, including any anticipated water quality changes resulting from the proposed increased TOC limit. The evaluation shall include the following;

(A) An exposure assessment that characterizes the quality of the water consumed and the quantity of contaminants and chemicals consumed,

(B) All available human epidemiologic studies of the population that has consumed water impacted by the GRRP,

(C) The results of laboratory animal studies and health risk assessments available in peer-reviewed literature pertaining to water impacted by the GRRP and anticipated water quality changes resulting from the proposed increased TOC, including studies or assessments where extrapolation of data may be relevant,

(D) A health risk assessment of the potential individual and cumulative effects of each of the regulated contaminants identified in section 62320.112, and the chemicals or contaminants monitored pursuant to sections 60320.120(a) and (c), that includes;

1. lifetime risks of cancer, and
2. risks of non-cancer effects, and

(E) A report detailing comments, questions, concerns, and conclusions of a review by an independent scientific peer review advisory panel that includes, as a minimum, a toxicologist, an epidemiologist, an engineering geologist or hydrogeologist registered in California, an engineer licensed in California with at least three years of experience in wastewater treatment and public water supply, a microbiologist, and a chemist.

Article 5.2. Indirect Potable Reuse: Groundwater Replenishment – Subsurface Application.

§60320.200. General Requirements.

(a) The requirements of this Article apply to Groundwater Replenishment Reuse Projects (GRRPs) utilizing subsurface application, which receive initial permits from the Regional Board after June 18, 2014. Within 12 months after June 18, 2014, a project sponsor for a GRRP permitted on or before June 18, 2014, shall submit a report to the Department and appropriate Regional Board assessing its compliance with the requirements of this Article. For each requirement considered noncompliant and applicable by the Department or Regional Board, a project sponsor shall submit a schedule to the Department and Regional Board, for demonstrating and/or achieving compliance with the applicable requirements of this Article. Unless directed otherwise by the Department, a project sponsor's report for a GRRP permitted on or before June 18, 2014, need not assess compliance with requirements of this Article that are required to be

met prior to operation of a GRRP, except subsection (b) of this section. The report is subject to review and approval by the Department and Regional Board. A project sponsor shall ensure the GRRP continuously treats, with full advanced treatment meeting the criteria in section 60320.201, the entire recycled municipal wastewater stream prior to application.

(b) Prior to operation of a GRRP, the GRRP's project sponsor shall obtain Department approval of a plan describing the steps a project sponsor will take to provide an alternative source of drinking water supply to all users of a producing drinking water well, or a Department-approved treatment mechanism a project sponsor will provide to all owners of a producing drinking water well, that as a result of the GRRP's operation, as determined by the Department:

(1) violates a California or federal drinking water standard;

(2) has been degraded to the degree that it is no longer a safe source of drinking water; or

(3) receives water that fails to meet section 60320.208.

(c) Prior to operating a GRRP, a project sponsor shall collect at least four samples, at least one sample each quarter, from each potentially affected aquifer. The samples shall be representative of water in each aquifer, taking into consideration seasonal variations, and be analyzed for the chemicals, contaminants, and characteristics pursuant to sections 60320.210, 60320.212, 60320.218, and 60320.220.

(d) A GRRP's recycled municipal wastewater shall be retained underground for a period of time no less than the retention time required pursuant to sections 60320.208 and 60320.224. The GRRP shall be designed and operated in a manner that ensures water treated pursuant to this Article, beyond the boundary described in subsection (e)(2), meets the recycled municipal wastewater contributions (RWC) requirements in section 60320.216.

(e) Based on hydrogeologic flowpaths, a GRRP's project sponsor shall provide the Department, Regional Board, and local well-permitting authorities a map of the GRRP site at a scale of 1:24,000 or larger (1 inch equals 2,000 feet or 1 inch equals less than 2,000 feet) or, if necessary, a site sketch at a scale providing more detail, that clearly indicates the criteria in paragraphs (1) – (4) below. A revised map shall be prepared and provided when conditions change such that the previous map no longer accurately reflects current conditions.

(1) the location and boundaries of the GRRP;

(2) a boundary representing a zone of controlled drinking water well construction, the greatest of the horizontal and vertical distances reflecting the retention times required pursuant to sections 60320.208 and 60320.224;

(3) a secondary boundary representing a zone of potential controlled drinking water well construction, depicting the zone within which a well would extend the

boundary in paragraph (2) to include existing or potential future drinking water wells, thereby requiring further study and potential mitigating activities prior to drinking water well construction; and

(4) the location of all monitoring wells established pursuant to section 60320.226, and drinking water wells within two years travel time of the GRRP based on groundwater flow directions and velocities expected under GRRP operating conditions.

(f) Prior to operating a GRRP, a project sponsor shall demonstrate to the Department and Regional Board that a project sponsor possesses adequate managerial and technical capability to assure compliance with this Article.

(g) Prior to replenishing a groundwater basin or an aquifer with recycled municipal wastewater, a GRRP's project sponsor shall demonstrate that all treatment processes have been installed and can be operated by a project sponsor to achieve their intended function. A protocol describing the actions to be taken to meet this subsection shall be included in the engineering report submitted pursuant section 60323.

(h) In the engineering report required pursuant to section 60323, a project sponsor for a GRRP shall include a hydrogeological assessment of the proposed GRRP's setting. The assessment shall include the following:

(1) the qualifications of the individual(s) preparing the assessment;

(2) a general description of geologic and hydrogeological setting of the groundwater basin(s) potentially directly impacted by the GRRP;

(3) a detailed description of the stratigraphy beneath the GRRP, including the composition, extent, and physical properties of the affected aquifers; and

(4) based on at least four rounds of consecutive quarterly monitoring to capture seasonal impacts;

(A) the existing hydrogeology and the hydrogeology anticipated as a result of the operation of the GRRP, and

(B) maps showing quarterly groundwater elevation contours, along with vector flow directions and calculated hydraulic gradients.

(i) If a project sponsor fails to complete compliance monitoring required pursuant to this Article, the Regional Board may determine water quality-related compliance based on available data.

(j) A project sponsor shall ensure that the recycled municipal wastewater used for a GRRP shall be from a wastewater management agency that is not in violation of the effluent limits pertaining to groundwater replenishment pursuant to this Article, as established in the wastewater management agency's Regional Board permit.

(k) If a project sponsor has been directed by the Department or Regional Board to suspend subsurface application pursuant to this Article, subsurface application shall not resume until the project sponsor has obtained Department and Regional Board approval.

§60320.201. Advanced Treatment Criteria.

Full advanced treatment is the treatment of an oxidized wastewater, as defined in section 60301.650, using a reverse osmosis and an oxidation treatment process that, at a minimum, meets the criteria of this section.

(a) A project sponsor shall select for use a reverse osmosis membrane such that:

(1) each membrane element used in the project has achieved a minimum rejection of sodium chloride of no less than 99.0 percent (99.0%) and an average (nominal) rejection of sodium chloride of no less than 99.2 percent (99.2%), as demonstrated through Method A of ASTM International's method D4194-03 (2008) using the following substitute test conditions:

(A) tests are operated at a recovery of no less than 15 percent (15%);

(B) sodium chloride rejection is based on three or more successive measurements, after flushing and following at least 30 minutes of operation having demonstrated that rejection has stabilized;

(C) an influent pH no less than 6.5 and no greater than 8.0; and

(D) an influent sodium chloride concentration of no greater than 2,000 mg/L, to be verified prior to the start of testing; and

(2) during the first twenty weeks of full-scale operation the membrane produces a permeate with no more than five percent (5%) of the sample results having TOC concentrations greater than 0.25 mg/L, as verified through monitoring no less frequent than weekly.

(b) For the reverse osmosis treatment process, a project sponsor shall propose, for Department review and approval, on-going performance monitoring (e.g., conductivity or TOC) that indicates when the integrity of the process has been compromised. The proposal shall include at least one form of continuous monitoring, as well as the associated surrogate and/or operational parameter limits and alarm settings that indicate when the integrity has been compromised.

(c) To demonstrate a sufficient oxidation process has been designed for implementation, a project sponsor shall:

(1) Perform an occurrence study on the project's municipal wastewater to identify indicator compounds and select a total of at least nine indicator compounds, with at least one from each of the functional groups in subparagraphs (A) through (I) below. A project sponsor shall submit an occurrence study protocol, as well as the subsequent results and chosen indicator compounds, to the Department for review and approval.

(A) Hydroxy Aromatic

(B) Amino/Acylamino Aromatic

(C) Nonaromatic with carbon double bonds
(D) Deprotonated Amine
(E) Alkoxy Polyaromatic
(F) Alkoxy Aromatic
(G) Alkyl Aromatic
(H) Saturated Aliphatic
(I) Nitro Aromatic

(2) Utilize an oxidation process that achieves optimal removal of the indicator compounds selected in paragraph (1) such that removal is no less than;

(A) 0.5-log (69 percent) for each indicator compound representing the functional groups in paragraphs (1)(A) through (1)(G), and

(B) 0.3-log (50 percent) for each indicator compound representing the functional groups in paragraphs (1)(H) and (1)(I).

(3) Establish at least one surrogate or operational parameter that reflects the removal of at least five of the nine indicator compounds selected pursuant to paragraph (1) such that;

(A) at least one of the five indicator compounds represents at least one functional group in paragraphs (1)(A) through (1)(G),

(B) at least one of the five indicator compounds represents at least one functional group in paragraphs (1)(H) or (1)(I),

(C) at least one surrogate or operational parameter is capable of being monitored continuously, recorded, and have associated alarms, and

(D) a surrogate or operational parameter, including the parameter in subparagraph (C), is identified that indicates when the process may no longer meet the criteria established in paragraph (2).

(4) Conduct testing that includes confirmation of the findings of the occurrence study in paragraph (1) and provides evidence that the requirements of paragraphs (2) and (3) can be met with a full-scale oxidation process. The testing shall include challenge or spiking tests conducted to determine the removal differential under normal operating conditions utilizing, at minimum, the nine indicator compounds identified in paragraph (1). A project sponsor shall submit a testing protocol, as well as the subsequent results, to the Department for review and approval.

(d) In lieu of demonstrating that a sufficient oxidation process has been designed for implementation pursuant to subsection (c), a project sponsor may conduct testing demonstrating that the oxidation process will provide no less than 0.5-log (69 percent) reduction of 1,4-dioxane.

(1) A project sponsor shall submit a testing protocol, as well as the subsequent results, to the Department for review and approval. The testing shall include challenge or spiking tests, using 1,4-dioxane, to demonstrate the proposed oxidation process will achieve the minimum 0.5-log reduction under the proposed oxidation process's normal full-scale operating conditions.

(2) A project sponsor shall establish surrogate and/or operational parameters that reflect whether the minimum 0.5-log 1,4-dioxane reduction design criteria is being met. At least one surrogate or operational parameter shall be capable of being monitored continuously, recorded, and have associated alarms that indicate when the process is not operating as designed.

(e) During the full-scale operation of the oxidation process designed pursuant to subsection (c) or (d), a project sponsor shall continuously monitor the surrogate and/or operational parameters established pursuant to subsection (c)(3)(C) or (d)(2), as applicable. A project sponsor shall implement, in full-scale operation, the oxidation process as designed pursuant to subsection (c) or (d).

(f) Within 60 days after completing the initial 12-months of monitoring pursuant to subsection (e), a project sponsor shall submit a report to the Department and Regional Board that includes:

(1) the results of the monitoring performed in subsection (e);

(2) the removal differential of the indicator compounds;

(3) a description of the efficacy of the surrogate and/or operational parameters to reflect the removal differential of the indicator compounds; and

(4) a description of actions taken, or to be taken, if the indicator compound removal did not meet the associated design criteria in subsection (c) or (d), the continuous surrogate and/or operational parameter monitoring in subsection (c)(3)(C) or (d)(2) fails to correspond to the differential indicator compound removal, or the surrogate and/or operational parameter established in subsection (c)(3)(D) or (d)(2) is not met.

(g) Within 60 days after completing the initial 12 months of operation of the reverse osmosis process, a project sponsor shall submit a report to the Department and Regional Board describing the effectiveness of the treatment, process failures, and actions taken in the event the on-going monitoring in subsection (b) indicated that process integrity was compromised.

(h) Each quarter, a project sponsor shall calculate what percent of results of the quarter's monitoring, conducted pursuant to subsections (b) and (e), did not meet the surrogate and/or operational parameter limits established to assure proper on-going performance of the reverse osmosis and oxidation processes. If the percent is greater than ten, within 45 days after the end of the quarter a project sponsor shall:

(1) submit a report to the Department and Regional Board describing the corrective actions planned or taken to reduce the percent to ten percent (10%) or less; and

(2) consult with the Department and, if required, comply with an alternative monitoring plan approved by the Department.

(i) Each month a project sponsor shall collect samples (grab or composite) representative of the effluent of the advanced treatment process and have the samples

analyzed for contaminants having MCLs and notification levels (NLs). After 12 consecutive months with no results exceeding an MCL or NL, a project sponsor may apply for a reduced monitoring frequency. The reduced monitoring frequency shall be no less than quarterly. Monitoring conducted pursuant to this subsection may be used in lieu of the monitoring (for the same contaminants) required pursuant to sections 60320.212 and 60320.220. The effluent of the advanced treatment process shall not exceed an MCL.

§60320.202. Public Hearing.

(a) A public hearing for a GRRP shall be held by a project sponsor prior to the Department's submittal of its recommendations to the Regional Board for the GRRP's initial permit and any time an increase in maximum RWC has been proposed but not addressed in a prior public hearing. Prior to a public hearing conducted pursuant to this section, a project sponsor shall provide the Department, for its review and approval, the information a project sponsor intends to present at the hearing. Following the Department's approval of the information, a project sponsor shall place the information on a project sponsor's Web site and in a repository that provides at least 30 days of public access to the information prior to the public hearing.

(b) Prior to placing the information required pursuant to subsection (a) in a repository, a project sponsor shall:

(1) Notify the public of the following;

(A) the location and hours of operation of the repository,

(B) the Internet address where the information may be viewed,

(C) the purpose of the repository and public hearing,

(D) the manner in which the public can provide comments, and

(E) the date, time, and location of the public hearing; and

(2) At a minimum, notify the first downgradient drinking water well owner and well owners whose drinking water well is within 10 years from the GRRP based on groundwater flow directions and velocities.

(c) Unless directed otherwise by the Department, the public notification made pursuant to subsection (b)(2) shall be by direct mail and the notification made pursuant to subsection (b)(1) shall be delivered in a manner to reach persons whose source of drinking water may be impacted by the GRRP, using one or more of the following methods:

(1) local newspaper(s) publication of general circulation;

(2) mailed or direct delivery of a newsletter;

(3) conspicuously placed statement in water bills; and/or

(4) television and/or radio.

§60320.204. Lab Analyses.

(a) Analyses for contaminants having primary or secondary MCLs shall be performed by laboratories approved to perform such analyses by the Department utilizing Department-approved drinking water methods.

(b) Analyses for chemicals other than those having primary or secondary MCLs shall be described in the GRRP's Operation Optimization Plan prepared pursuant to section 60320.222.

§60320.206. Wastewater Source Control.

A project sponsor shall ensure that the recycled municipal wastewater used for a GRRP shall be from a wastewater management agency that:

(a) administers an industrial pretreatment and pollutant source control program; and

(b) implements and maintains a source control program that includes, at a minimum;

(1) an assessment of the fate of Department-specified and Regional Board-specified chemicals and contaminants through the wastewater and recycled municipal wastewater treatment systems,

(2) chemical and contaminant source investigations and monitoring that focuses on Department-specified and Regional Board-specified chemicals and contaminants,

(3) an outreach program to industrial, commercial, and residential communities within the portions of the sewage collection agency's service area that flows into the water reclamation plant subsequently supplying the GRRP, for the purpose of managing and minimizing the discharge of chemicals and contaminants at the source, and

(4) a current inventory of chemicals and contaminants identified pursuant to this section, including new chemicals and contaminants resulting from new sources or changes to existing sources, that may be discharged into the wastewater collection system.

§60320.208. Pathogenic Microorganism Control.

(a) A project sponsor shall design and operate a GRRP such that the recycled municipal wastewater used as recharge water for a GRRP receives treatment that achieves at least 12-log enteric virus reduction, 10-log Giardia cyst reduction, and 10-log Cryptosporidium oocyst reduction. The treatment train shall consist of at least three separate treatment processes. For each pathogen (i.e., virus, Giardia cyst, or Cryptosporidium oocyst), a separate treatment process may be credited with no more than 6-log reduction, with at least three processes each being credited with no less than 1.0-log reduction.

(b) For each month retained underground as demonstrated in subsection (e), the recycled municipal wastewater or recharge water will be credited with 1-log virus reduction.

(c) With the exception of log reduction credited pursuant to subsection (b), a project sponsor shall validate each of the treatment processes used to meet the requirements in subsection (a) for their log reduction by submitting a report for the Department's review and approval, or by using a challenge test approved by the Department, that provides evidence of the treatment process's ability to reliably and consistently achieve the log reduction. The report and/or challenge test shall be prepared by an engineer licensed in California with at least five years of experience, as a licensed engineer, in wastewater treatment and public water supply, including the evaluation of treatment processes for pathogen control. With the exception of retention time underground, a project sponsor shall propose and include in its Operation Optimization Plan prepared pursuant to section 60320.222, on-going monitoring using the pathogenic microorganism of concern or a microbial, chemical, or physical surrogate parameter(s) that verifies the performance of each treatment process's ability to achieve its credited log reduction.

(d) To demonstrate the retention time underground in subsection (b) a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point. A project sponsor for a GRRP shall initiate the tracer study prior to the end of the third month of operation. A project sponsor for a GRRP permitted on or before June 18, 2014, that has not already performed such a tracer study shall complete a tracer study demonstrating the retention time underground. With Department approval, an intrinsic tracer may be used in lieu of an added tracer, with no more credit provided than the corresponding virus log reduction in column 2 of Table 60320.208.

(e) For the purpose of siting a GRRP location during project planning and until a GRRP's project sponsor has met the requirements of subsection (d), for each month of retention time estimated using the method in column 1, the recycled municipal wastewater or recharge water shall be credited with no more than the corresponding virus log reduction in column 2 of Table 60320.208.

Table 60320.208

Column 1	Column 2
Method used to estimate the retention time to the nearest downgradient drinking water well	**Virus Log Reduction Credit per Month**
Tracer study utilizing an added tracer.[1]	1.0 log
Tracer study utilizing an intrinsic tracer.[1]	0.67 log
Numerical modeling consisting of calibrated finite element or finite difference models using validated and verified computer codes used for simulating groundwater flow.	0.50 log
Analytical modeling using existing academically-accepted equations such as Darcy's Law to estimate groundwater flow conditions based on simplifying aquifer assumptions.	0.25 log

[1] The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point.

(f) A project sponsor shall obtain Department approval for the protocol(s) to be used to establish the retention times in subsections (d) and (e).

(g) Based on changes in hydrogeological or climatic conditions since the most recent demonstration, the Department may require a GRRP's project sponsor to demonstrate that the underground retention times required in this section are being met.

(h) If a pathogen reduction in subsection (a) is not met based on the on-going monitoring required pursuant to subsection (c), within 24 hours of being aware a project sponsor shall immediately investigate the cause and initiate corrective actions. The project sponsor shall immediately notify the Department and Regional Board if the GRRP fails to meet the pathogen reduction criteria longer than 4 consecutive hours, or more than a total of 8 hours during any 7-day period. Failures of shorter duration shall be reported to the Regional Board by a project sponsor no later than 10 days after the month in which the failure occurred.

(i) If the effectiveness of a treatment train's ability to reduce enteric virus is less than 10-logs, or Giardia cyst or Cryptosporidium oocyst reduction is less than 8-logs, a project sponsor shall immediately notify the Department and Regional Board, and discontinue application of recycled municipal wastewater at the GRRP, unless directed otherwise by the Department or Regional Board.

§60320.210. Nitrogen Compounds Control.

(a) To demonstrate control of the nitrogen compounds, a project sponsor shall:

(1) Each week, at least three days apart as specified in the GRRP's Operation Optimization Plan, collect at least two total nitrogen samples (grab or 24-hour composite) representative of the recycled municipal wastewater or recharge water applied. Samples may be collected before or after subsurface application;

(2) Have the samples collected pursuant to paragraph (1) analyzed for total nitrogen, with the laboratory being required by a project sponsor to complete each analysis within 72 hours and have the result reported to a project sponsor within the same 72 hours if the result of any single sample exceeds 10 mg/L;

(3) If the average of the results of two consecutive samples collected pursuant to paragraph (1) exceeds 10 mg/L total nitrogen;

(A) take a confirmation sample and notify the Department and the Regional Board within 48 hours of being notified of the results by the laboratory,

(B) investigate the cause for the exceedances and take actions to reduce the total nitrogen concentrations to ensure continued or future exceedances do not occur, and

(C) initiate additional monitoring for nitrogen compounds as described in the GRRP's Operation Optimization Plan, including locations in the groundwater basin, to identify elevated concentrations and determine whether such elevated concentrations exceed or may lead to an exceedance of a nitrogen-based MCL; and

(4) If the average of the results of four consecutive samples collected pursuant to paragraph (1) exceeds 10 mg/L total nitrogen, suspend the subsurface application of recycled municipal wastewater. Subsurface application shall not resume until corrective actions have been taken and at least two consecutive total nitrogen sampling results are less than 10 mg/L.

(b) Following Department and Regional Board approval, a project sponsor may initiate reduced monitoring frequencies for total nitrogen. A project sponsor may apply to the Department and Regional Board for reduced monitoring frequencies for total nitrogen if, for the most recent 12 months:

(1) the average of all results did not exceed 5 mg/L total nitrogen; and

(2) the average of a result and its confirmation sample (taken within 24 hours of receipt of the initial result) did not exceed 10 mg/L total nitrogen.

(c) If the results of reduced monitoring conducted as approved pursuant to subsection (b) exceed the total nitrogen concentration criteria in subsection (b), a project sponsor shall revert to the monitoring frequencies for total nitrogen prior to implementation of the reduced frequencies. Reduced frequency monitoring shall not resume unless the requirements of subsection (b) are met.

§60320.212. Regulated Contaminants and Physical Characteristics Control.

(a) Each quarter, as specified in the GRRP's Operation Optimization Plan, a project sponsor shall collect samples (grab or 24-hour composite) representative of the applied recycled municipal wastewater and have the samples analyzed for:

(1) the inorganic chemicals in Table 64431-A, except for nitrogen compounds;

(2) the radionuclide chemicals in Tables 64442 and 64443;

(3) the organic chemicals in Table 64444-A;

(4) the disinfection byproducts in Table 64533-A; and

(5) lead and copper.

(b) Recharge water may be monitored in lieu of recycled municipal wastewater to satisfy the monitoring requirements in subsection (a)(4) if the fraction of recycled municipal wastewater in the recharge water is equal to or greater than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter. If the fraction of recycled municipal wastewater in the recharge water being monitored is less than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter, the reported value shall be adjusted to exclude the effects of dilution.

(c) Each year, the GRRP's project sponsor shall collect at least one representative sample (grab or 24-hour composite) of the recycled municipal wastewater and have the sample(s) analyzed for the secondary drinking water contaminants in Tables 64449-A and 64449-B.

(d) If a result of the monitoring performed pursuant to subsection (a) exceeds a contaminant's MCL or action level (for lead and copper), a project sponsor shall collect another sample within 72 hours of notification of the result and then have it analyzed for the contaminant as confirmation.

(1) For a contaminant whose compliance with its MCL or action level is not based on a running annual average, if the average of the initial and confirmation sample exceeds the contaminant's MCL or action level, or the confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP's project sponsor shall notify the Department and Regional Board within 24 hours and initiate weekly monitoring until four consecutive weekly results are below the contaminant's MCL or action level. If the running four-week average exceeds the contaminant's MCL or action level, the GRRP's project sponsor shall notify the Department and Regional Board within 24 hours and, if directed by the Department or Regional Board, suspend application of the recycled municipal wastewater.

(2) For a contaminant whose compliance with its MCL is based on a running annual average, if the average of the initial and confirmation sample exceeds the contaminant's MCL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the contaminant's MCL.

(A) If the running four-week average exceeds the contaminant's MCL, a project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to the Department and Regional Board no later than 45 days following the quarter in which the exceedance occurred.

(B) If the running four-week average exceeds the contaminant's MCL for sixteen consecutive weeks, a project sponsor shall notify the Department and Regional Board within 48 hours of knowledge of the exceedance and, if directed by the Department or Regional Board, suspend application of the recycled municipal wastewater.

(e) If the annual average of the results of the monitoring performed pursuant to subsection (c) exceeds a contaminant's secondary MCL in Table 64449-A or the upper limit in Table 64449-B, a project sponsor shall initiate quarterly monitoring of the recycled municipal wastewater for the contaminant and, if the running annual average of quarterly-averaged results exceeds a contaminant's secondary MCL or upper limit, describe the reason(s) for the exceedance and any corrective actions taken a report submitted to the Regional Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to the Department. The annual monitoring in subsection (c) may resume if the running annual average of quarterly results does not exceed a contaminant's secondary MCL or upper limit.

(f) If four consecutive quarterly results for asbestos are below the detection limit in Table 64432-A for asbestos, monitoring for asbestos may be reduced to one sample every three years. Quarterly monitoring shall resume if asbestos is detected.

§60320.214. Diluent Water Requirements.

To be credited with diluent water used in calculating an RWC pursuant to section 60320.216, the GRRP shall comply with the requirements of this section and receive Department approval. For diluent water that is a Department-approved drinking water source, the GRRP's project sponsor is exempt from subsections (a) and (b). The GRRP's project sponsor shall:

(a) Monitor the diluent water quarterly for nitrate and nitrite and, within 72 hours of being informed by the laboratory of a nitrate, nitrite, or nitrate plus nitrite result exceeding a maximum contaminant level (MCL), collect a confirmation sample. If the average of the two samples is greater than an MCL;

(1) notify the Department and the Regional Board within 48 hours of receiving the confirmation sample result,

(2) investigate the cause(s) and implement corrective actions, and

(3) each week, collect and analyze two grab samples at least three days apart as specified in the GRRP's Operation Optimization Plan. If the average of the results for a two-week period exceeds the MCL, subsurface application of the diluent water shall not be used in the calculation of RWC until corrective actions are made. Quarterly monitoring may resume if four consecutive results are below the MCL.

(b) Conduct a source water evaluation per the California-Nevada Section of American Water Works Association's Watershed Sanitary Survey Guidance Manual (1993), as it may be amended, or other Department-approved evaluation, of the diluent water for Department review and approval that includes, but is not limited to:

(1) a description of the source of the diluent water;

(2) delineation of the origin and extent of the diluent water;

(3) the susceptibility of the diluent water to contamination;

(4) the identification of known or potential contaminants; and

(5) an inventory of the potential sources of diluent water contamination.

(c) Ensure diluent water does not exceed a primary MCL, a secondary MCL upper limit, or a notification level (NL), and implement a Department-approved water quality monitoring plan for Department-specified contaminants to demonstrate compliance with the primary MCLs, secondary MCLs, and NLs. The plan shall also include:

(1) except for Department-approved drinking water sources used as a diluent water, monitoring of any chemicals or contaminants required pursuant to section 60320.220, based on the source water evaluation performed in subsection (b); and

(2) actions to be taken in the event of non-compliance with a primary MCL, secondary MCL, or exceedance of a NL.

(d) Develop a method for determining the volume of diluent water to be credited and demonstrate that the diluent water will be introduced in a manner such that the diluent water volume will not result in the GRRP's 120-month running monthly average RWC

exceeding its maximum RWC at or beyond the boundary established pursuant to section 60320.200(e)(2). The method shall be submitted to the Department for review and approval, and be conducted at a frequency specified in the engineering report prepared pursuant to section 60323. The method shall address all conditions that influence how and when the recycled municipal wastewater and diluent water arrive at all points along the boundary. The conditions must include, but are not limited to, temporal variability in the diluent water supply and regional groundwater gradients, the difference in the distribution of the recycled municipal wastewater and diluent water between individual aquifers where more than one aquifer is replenished, and the difference in travel-time when recycled municipal wastewater and diluent water are introduced at different locations and/or times.

(e) For credit prior to the operation of the GRRP, but not to exceed 120 months:

(1) demonstrate that the diluent water met the nitrate, nitrite, and nitrate plus nitrite MCLs, NLs, and the water quality requirements in section 60320.212;

(2) provide evidence that the quantity of diluent water has been accurately determined and was distributed such that the proposed or permitted maximum RWC would not have been exceeded; and

(3) conduct a source water evaluation of the diluent water pursuant to subsection (b).

(f) In the Operation Optimization Plan prepared pursuant to section 60320.222, include a description of:

(1) how the diluent water will be distributed in a manner that ensures that the maximum RWC will not be exceeded during normal operations; and

(2) the actions to be taken in the event the diluent water is curtailed or is no longer available.

(g) If approved by the Department, recharge water may be monitored in lieu of a diluent water source if the diluent water source cannot be monitored directly in a manner that provides samples representative of the diluent water being applied.

§60320.216. Recycled Municipal Wastewater Contribution (RWC) Requirements.

(a) Each month, for each subsurface application GRRP used for replenishing a groundwater basin, the GRRP's project sponsor shall calculate the running monthly average (RMA) RWC based on the total volume of the recycled municipal wastewater and credited diluent water for the preceding 120 months. For GRRPs in operation less than 120 months, calculation of the RMA RWC shall commence after 30 months of recycled municipal wastewater application, based on the total volume of the recycled municipal wastewater and credited diluent water introduced during the preceding months.

(b) The GRRP's RMA RWC, as determined in subsection (a), shall not exceed the maximum RWC specified for the GRRP by the Department.

(c) The initial maximum RWC, which may be up to 1.0, will be based on, but not limited to, the Department's review of the engineering report, information obtained as a result of the public hearing(s), and a project sponsor's demonstration that the treatment processes will reliably achieve TOC concentrations no greater than 0.5 mg/L.

(d) A GRRP may increase its maximum RWC, provided:

(1) the increase has been approved by the Department and Regional Board;

(2) for the previous 52 weeks the TOC 20-week running average, as monitored pursuant to section 62320.218, has not exceeded 0.5 mg/L; and

(3) the GRRP has received a permit from the Regional Board that allows operation of the GRRP at the increased maximum RWC.

(e) If the RMA RWC exceeds its maximum RWC, the GRRP's project sponsor shall:

(1) notify the Department and Regional Board in writing within seven days of knowledge of the exceedance; and

(2) within 60 days of knowledge of the exceedance, implement corrective action(s) and additional actions that may be required by the Department or Regional Board, and submit a report to the Department and Regional Board describing the reason(s) for the exceedance and the corrective action(s) taken to avoid future exceedances.

§60320.218. Total Organic Carbon Requirements.

(a) For each subsurface application GRRP used for replenishing a groundwater basin, the GRRP's project sponsor shall monitor the applied recycled municipal wastewater for TOC as follows:

(1) Prior to replenishment, at least one 24-hour composite sample each week.

(2) Grab samples may be used in lieu of the 24-hour composite samples required in paragraph (1) if the GRRP demonstrates that a grab sample is representative of the water quality throughout a 24-hour period.

(b) Analytical results of the TOC monitoring performed pursuant to subsection (a) shall not exceed 0.5 mg/L based on:

(1) the 20-week running average of all TOC results; and

(2) the average of the last four TOC results.

(c) If the GRRP exceeds the limit in subsection (b)(1) based on a 20-week running average, a project sponsor shall take the following actions upon being notified of the results:

(1) immediately suspend the addition of recycled municipal wastewater until at least two consecutive results, three days apart, are less than the limit;

(2) notify the Department and Regional Board within seven days of suspension; and

(3) within 60 days, submit a report to the Department and Regional Board describing the reasons for the exceedance and the corrective actions to avoid future exceedances. At a minimum, the corrective actions shall include a reduction of RWC sufficient to comply with the limit.

(d) If the GRRP exceeds the limit in subsection (b)(2) based on the average of the last four results, a project sponsor shall, within 60 days of being notified of the results, submit a report to the Department and Regional Board describing the reasons for the exceedance and the corrective actions taken to avoid future exceedances.

(e) To use one or more wastewater chemicals in lieu of TOC, a project sponsor shall obtain approval from the Department. At a minimum, the chemical(s) used in lieu of TOC shall:

(1) be quantifiable in the wastewater, recycled municipal wastewater, groundwater, and throughout the treatment processes; and

(2) have identifiable treatment performance standards as protective of public health as the TOC standards in this Article.

§60320.220. Additional Chemical and Contaminant Monitoring.

(a) Each quarter, the GRRP's project sponsor shall sample and analyze the recycled municipal wastewater and the groundwater (from the downgradient monitoring wells established pursuant to section 60320.226) for the following:

(1) Priority Toxic Pollutants (chemicals listed in 40 CFR section 131.38, "Establishment of numeric criteria for priority toxic pollutants for the State of California", as the foregoing may be amended) specified by the Department, based on the Department's review of the GRRP's engineering report; and

(2) Chemicals that the Department has specified, based on a review of the GRRP's engineering report, the affected groundwater basin(s), and the results of the assessment performed pursuant to section 60320.206(b)(1).

(b) Each quarter, the GRRP's project sponsor shall sample and analyze the recycled municipal wastewater for Department-specified chemicals having notification levels (NLs). Recharge water may be monitored in lieu of recycled municipal wastewater if the fraction of recycled municipal wastewater in the recharge water is equal to or greater than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter. If the fraction of recycled municipal wastewater in the recharge water being monitored is less than the average fraction of recycled municipal wastewater in the recharge water applied over the quarter, the reported value shall be adjusted to exclude

the effects of dilution. If a result exceeds a NL, within 72 hours of notification of the result a project sponsor shall collect another sample and have it analyzed for the contaminant as confirmation. If the average of the initial and confirmation sample exceeds the contaminant's NL, or a confirmation sample is not collected and analyzed pursuant to this subsection, the GRRP shall initiate weekly monitoring for the contaminant until the running four-week average no longer exceeds the NL.

(1) If the running four-week average exceeds the contaminant's NL, a project sponsor shall describe the reason(s) for the exceedance and provide a schedule for completion of corrective actions in a report submitted to the Regional Board no later than 45 days following the quarter in which the exceedance occurred, with a copy concurrently provided to the Department.

(2) If the running four-week average exceeds the contaminant's NL for sixteen consecutive weeks, a project sponsor shall notify the Department and Regional Board within 48 hours of knowledge of the exceedance.

(c) A project sponsor may reduce monitoring for the chemicals in this section to once each year following Department approval based on the Department's review of the most recent two years of results of the monitoring performed pursuant to this section.

(d) Annually, a project sponsor shall monitor the recycled municipal wastewater for indicator compounds specified by the Department and Regional Board based on the following:

(1) a review of the GRRP's engineering report;

(2) the inventory developed pursuant to section 60320.206(b)(4);

(3) the affected groundwater basin(s);

(4) an indicator compound's ability to characterize the presence of pharmaceuticals, endocrine disrupting chemicals, personal care products, and other indicators of the presence of municipal wastewater; and

(5) the availability of a test method for a chemical.

(e) A chemical or contaminant detected as a result of monitoring conducted pursuant to this section shall be reported to the Department and Regional Board no later than the quarter following the quarter in which the results are received by the GRRP's project sponsor.

§60320.222. Operation Optimization and Plan.

(a) Prior to operation of a GRRP, a project sponsor shall submit an Operation Optimization Plan to the Department and Regional Board for review and approval. At a minimum, the Operation Optimization Plan shall identify and describe the operations, maintenance, analytical methods, monitoring necessary for the GRRP to meet the requirements of this Article, and the reporting of monitoring results to the Department and Regional Board. A project sponsor shall be responsible for ensuring that the

Operation Optimization Plan is, at all times, representative of the current operations, maintenance, and monitoring of the GRRP. A GRRP's project sponsor shall make the Operation Optimization Plan available to the Department or Regional Board for review upon request.

(b) During the first year of operation of a GRRP and at all times thereafter, all treatment processes shall be operated in a manner providing optimal reduction of all chemicals and contaminants including:

(1) microbial contaminants;

(2) regulated contaminants identified in section 60320.212 and the nitrogen compounds required pursuant to section 60320.210; and

(3) chemicals and contaminants required pursuant to section 60320.220.

(c) Within six months of optimizing treatment processes pursuant to subsection (b) and anytime thereafter operations are optimized that result in a change in operation, a project sponsor shall update the GRRP's Operation Optimization Plan to include such changes in operational procedures and submit the operations plan to the Department for review.

§60320.224. Response Retention Time.

(a) The recycled municipal wastewater applied by a GRRP shall be retained underground for a period of time necessary to allow a project sponsor sufficient response time to identify treatment failures and implement actions, including those required pursuant to section 60320.200(b), necessary for the protection of public health.

(b) The response retention time required in subsection (a) must be approved by the Department, based on information provided in the engineering report required pursuant to section 60323. The response retention time shall be no less than two months.

(c) To demonstrate the retention time underground is no less than the response retention time approved pursuant to subsection (b), a tracer study utilizing an added tracer shall be implemented under hydraulic conditions representative of normal GRRP operations. With Department approval, an intrinsic tracer may be used in lieu of an added tracer. For each month of retention time estimated utilizing the approved intrinsic tracer, a project sponsor shall receive no more than 0.67 months credit. The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reaches the monitoring point. A project sponsor for a GRRP shall initiate the tracer study prior to the end of the third month of operation. A project sponsor for a GRRP permitted on or

before June 18, 2014, that has not performed a tracer study shall complete a tracer study demonstrating the retention time underground.

(d) For the purpose of siting a GRRP location during project planning and until a GRRP's project sponsor has met the requirements of subsection (c), for each month of retention time estimated using the method in column 1, the recycled municipal wastewater or recharge water may be credited with no more than the corresponding response time in column 2 of Table 60320.224.

Table 60320.224

Column 1	Column 2
Method used to estimate the retention time	**Response Time Credit per Month**
Tracer study utilizing an added tracer.[1]	1.0 month
Tracer study utilizing an intrinsic tracer.[1]	0.67 month
Numerical modeling consisting of calibrated finite element or finite difference models using validated and verified computer codes used for simulating groundwater flow.	0.50 month
Analytical modeling using existing academically-accepted equations such as Darcy's Law to estimate groundwater flow conditions based on simplifying aquifer assumptions.	0.25 month

[1] The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reaches the monitoring point.

(e) A project sponsor shall obtain Department approval for the protocol(s) to be used to establish the retention times in subsections (c) and (d).

(f) Upon request from the Department, a project sponsor shall demonstrate that the underground retention times required in this section are being met based on changes in hydrogeological or climatic conditions since the most recent demonstration.

§60320.226. Monitoring Well Requirements.

(a) Prior to operating a GRRP, a project sponsor shall site and construct at least two monitoring wells downgradient of the GRRP such that:

(1) at least one monitoring well is located;

(A) no less than two weeks but no more than six months of travel time from the GRRP, and

(B) at least 30 days upgradient of the nearest drinking water well;

(2) in addition to the well(s) in paragraph (1) and after consultation with the Department, at least one monitoring well is located between the GRRP and the nearest downgradient drinking water well; and

(3) samples from the monitoring wells in paragraphs (1) and (2) can be;

(A) obtained independently from each aquifer initially receiving the water used as a source of drinking water supply that will receive the GRRP's recharge water, and

(B) validated as receiving recharge water from the GRRP.

(b) In addition to the monitoring required pursuant to section 60320.220, from each monitoring well in subsection (a)(1), and each monitoring well in subsection (a)(2) that has recharge water located within one year travel time of the well(s), a project sponsor shall collect two samples prior to GRRP operation and at least one sample each quarter after operation begins. Each sample shall be analyzed for total nitrogen, nitrate, nitrite, the contaminants in Tables 64449-A and B of section 64449, and any contaminants and chemicals specified by the Department or Regional Board based on the results of the recycled municipal wastewater monitoring conducted pursuant to this Article.

(c) If a result from the monitoring conducted pursuant to subsection (b) exceeds 80 percent of a nitrate, nitrite, or nitrate plus nitrite MCL a project sponsor shall, within 48 hours of being notified of the result by the laboratory, collect another sample and have it analyzed for the contaminant. If the average of the result of the initial sample and the confirmation sample exceed the contaminant's MCL, a project sponsor shall:

(1) within 24 hours of being notified by the laboratory of the confirmation sample result, notify the Department and Regional Board; and

(2) discontinue subsurface application of recycled municipal wastewater until corrective actions have been taken or evidence is provided to the Department and Regional Board that the contamination was not a result of the GRRP.

(d) For Department-specified chemical analyses completed in a month, a project sponsor shall ensure the laboratory electronically submits results to the Department no later than 45 days after the end of the month in which monitoring occurred, in a manner such that data is readily uploaded into the Department's database. Utilization of the process described on the Department's Web site will satisfy this requirement.

(e) The GRRP's project sponsor may discontinue monitoring for the chemicals and contaminants in subsection (b) following Department approval based on the Department's review of the most recent two years of monitoring results.

§60320.228. Reporting.

(a) No later than six months after the end of each calendar year, a project sponsor shall provide a report to the Department and Regional Board. Public water systems and drinking water well owners having downgradient sources potentially affected by the GRRP and within 10 years groundwater travel time from the GRRP shall be notified by direct mail and/or electronic mail of the availability of the report. The report shall be prepared by an engineer licensed in California and experienced in the fields of wastewater treatment and public water supply. The report shall include the following:

(1) A summary of the GRRP's compliance status with the monitoring requirements and criteria of this Article during the previous calendar year;

(2) For any violations of this Article during the previous calendar year;

(A) the date, duration, and nature of the violation,

(B) a summary of any corrective actions and/or suspensions of subsurface application of recycled municipal wastewater resulting from a violation, and

(C) if uncorrected, a schedule for and summary of all remedial actions;

(3) Any detections of monitored chemicals or contaminants, and any observed trends in the monitoring wells and diluent water supplies;

(4) Information pertaining to the vertical and horizontal migration of the recharge water plume;

(5) A description of any changes in the operation of any unit processes or facilities;

(6) A description of any anticipated changes, along with an evaluation of the expected impact of the changes on subsequent unit processes;

(7) The estimated quantity and quality of the recycled municipal wastewater and diluent water to be applied for the next calendar year;

(8) A summary of the measures taken to comply with section 60320.206 and 60320.200(j), and the effectiveness of the implementation of the measures; and

(9) Increases in RWC during the previous calendar year and RWC increases anticipated for the next calendar year.

(b) Every five years from the date of the initial approval of the engineering report required pursuant to section 60323, a project sponsor shall update the report to address any project changes and submit the report to the Department and Regional Board. The update shall include, but not be limited to:

(1) anticipated RWC increases, a description of how the RWC requirements in section 60320.216 will be met, and the expected impact the increase will have on the GRRP's ability to meet the requirements of this Article;

(2) evidence that the requirements associated with retention time in section 60320.208, if applicable, and section 60320.224 have been met; and

(3) a description of any inconsistencies between previous groundwater model predictions and the observed and/or measured values, as well as a description of how subsequent predictions will be accurately determined.

§60320.230. Alternatives.

(a) A project sponsor may use an alternative to a requirement in this Article if the GRRP's project sponsor:

(1) demonstrates to the Department that the proposed alternative assures at least the same level of protection to public health;

(2) receives written approval from the Department prior to implementation of the alternative; and

(3) if required by the Department or Regional Board, conducts a public hearing on the proposed alternative, disseminates information to the public, and receives public comments, pursuant to sections 60320.202(b) and (c).

(b) Unless specified otherwise by the Department, the demonstration in subsection (a)(1) shall include the results of a review of the proposed alternative by an independent scientific advisory panel that includes a toxicologist, a registered engineering geologist or hydrogeologist, an engineer licensed in California with at least three years of experience in wastewater treatment and public drinking water supply, a microbiologist, and a chemist.

Article 5.5. Other Methods of Treatment.

§60320.5. Other methods of treatment.

Methods of treatment other than those included in this chapter and their reliability features may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the methods of treatment and reliability features will assure an equal degree of treatment and reliability.

Article 6. Sampling and Analysis.

§60321. Sampling and analysis.

(a) Disinfected secondary-23, disinfected secondary-2.2, and disinfected tertiary recycled water shall be sampled at least once daily for total coliform bacteria. The samples shall be taken from the disinfected effluent and shall be analyzed by an approved laboratory.

(b) Disinfected tertiary recycled water shall be continuously sampled for turbidity using a continuous turbidity meter and recorder following filtration. Compliance with the daily average operating filter effluent turbidity shall be determined by averaging the levels of recorded turbidity taken at four-hour intervals over a 24-hour period. Compliance with turbidity pursuant to section 60301.320 (a)(2)(B) and (b)(1) shall be determined using the levels of recorded turbidity taken at intervals of no more than 1.2-hours over a 24- hour period. Should the continuous turbidity meter and recorder fail, grab sampling at a minimum frequency of 1.2-hours may be substituted for a period of up to 24-hours. The results of the daily average turbidity determinations shall be reported quarterly to the regulatory agency.

(c) The producer or supplier of the recycled water shall conduct the sampling required in subsections (a) and (b).

Article 7. Engineering Report and Operational Requirements.

§60323. Engineering report.

(a) No person shall produce or supply recycled water for reuse from a water reclamation plant without a Department-approved engineering report.

(b) The report shall be prepared by a qualified engineer licensed in California and experienced in the field of wastewater treatment, and shall contain a description of the design of the proposed reclamation system. The report shall clearly indicate the means for compliance with these regulations and any other features specified by the regulatory agency.

(c) The report shall contain a contingency plan which will assure that no untreated or inadequately treated wastewater will be delivered to the use area.

§60325. Personnel.

(a) Each reclamation plant shall be provided with a sufficient number of qualified personnel to operate the facility effectively so as to achieve the required level of treatment at all times.

(b) Qualified personnel shall be those meeting requirements established pursuant to Chapter 9 (commencing with Section 13625) of the Water Code.

§60327. Maintenance.

A preventive maintenance program shall be provided at each reclamation plant to ensure that all equipment is kept in a reliable operating condition.

§60329. Operating records and reports.

(a) Operating records shall be maintained at the reclamation plant or a central depository within the operating agency. These shall include: all analyses specified in the reclamation criteria; records of operational problems, plant and equipment breakdowns, and diversions to emergency storage or disposal; all corrective or preventive action taken.

(b) Process or equipment failures triggering an alarm shall be recorded and maintained as a separate record file. The recorded information shall include the time and cause of failure and corrective action taken.

(c) A monthly summary of operating records as specified under (a) of this section shall be filed monthly with the regulatory agency.

(d) Any discharge of untreated or partially treated wastewater to the use area, and the cessation of same, shall be reported immediately by telephone to the regulatory agency, the State Department of Health, and the local health officer.

§60331. Bypass.

There shall be no bypassing of untreated or partially treated wastewater from the reclamation plant or any intermediate unit processes to the point of use.

Article 8. General Requirements of Design.

§60333. Flexibility of design.

The design of process piping, equipment arrangement, and unit structures in the reclamation plant must allow for efficiency and convenience in operation and maintenance and provide flexibility of operation to permit the highest possible degree of treatment to be obtained under varying circumstances.

§60335. Alarms.

(a) Alarm devices required for various unit processes as specified in other sections of these regulations shall be installed to provide warning of:

(1) Loss of power from the normal power supply.

(2) Failure of a biological treatment process.

(3) Failure of a disinfection process.

(4) Failure of a coagulation process.

(5) Failure of a filtration process.

(6) Any other specific process failure for which warning is required by the regulatory agency.

(b) All required alarm devices shall be independent of the normal power supply of the reclamation plant.

(c) The person to be warned shall be the plant operator, superintendent, or any other responsible person designated by the management of the reclamation plant and capable of taking prompt corrective action.

(d) Individual alarm devices may be connected to a master alarm to sound at a location where it can be conveniently observed by the attendant. In case the reclamation plant is not attended full time, the alarm(s) shall be connected to sound at a police station, fire station or other full time service unit with which arrangements have been made to alert the person in charge at times that the reclamation plant is unattended.

§60337. Power supply.

The power supply shall be provided with one of the following reliability features:

(a) Alarm and standby power source.

(b) Alarm and automatically actuated short-term retention or disposal provisions as specified in Section 60341.

(c) Automatically actuated long-term storage or disposal provisions as specified in Section 60341.

Article 9. Reliability Requirements for Primary Effluent.

§60339. Primary treatment.

Reclamation plants producing reclaimed water exclusively for uses for which primary effluent is permitted shall be provided with one of the following reliability features:

(a) Multiple primary treatment units capable of producing primary effluent with one unit not in operation.

(b) Long-term storage or disposal provisions as specified in Section 60341.

Article 10. Reliability Requirements for Full Treatment.

§60341. Emergency storage or disposal.

(a) Where short-term retention or disposal provisions are used as a reliability feature, these shall consist of facilities reserved for the purpose of storing or disposing of untreated or partially treated wastewater for at least a 24-hour period. The facilities shall include all the necessary diversion devices, provisions for odor control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.

(b) Where long-term storage or disposal provisions are used as a reliability feature, these shall consist of ponds, reservoirs, percolation areas, downstream sewers leading to other treatment or disposal facilities or any other facilities reserved for the purpose of emergency storage or disposal of untreated or partially treated wastewater. These facilities shall be of sufficient capacity to provide disposal or storage of wastewater for at least 20 days, and shall include all the necessary diversion works, provisions for odor and nuisance control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.

(c) Diversion to a less demanding reuse is an acceptable alternative to emergency disposal of partially treated wastewater provided that the quality of the partially treated wastewater is suitable for the less demanding reuse.

(d) Subject to prior approval by the regulatory agency, diversion to a discharge point which requires lesser quality of wastewater is an acceptable alternative to emergency disposal of partially treated wastewater.

(e) Automatically actuated short-term retention or disposal provisions and automatically actuated long-term storage or disposal provisions shall include, in addition to provisions of (a), (b), (c), or (d) of this section, all the necessary sensors, instruments, valves and other devices to enable fully automatic diversion of untreated or partially treated wastewater to approved emergency storage or disposal in the event of failure of a treatment process and a manual reset to prevent automatic restart until the failure is corrected.

§60343. Primary treatment.

All primary treatment unit processes shall be provided with one of the following reliability features:

(a) Multiple primary treatment units capable of producing primary effluent with one unit not in operation.

(b) Standby primary treatment unit process.

(c) Long-term storage or disposal provisions.

§60345. Biological treatment.

All biological treatment unit processes shall be provided with one of the following reliability features:

(a) Alarm and multiple biological treatment units capable of producing oxidized wastewater with one unit not in operation.

(b) Alarm, short-term retention or disposal provisions, and standby replacement equipment.

(c) Alarm and long-term storage or disposal provisions.

(d) Automatically actuated long-term storage or disposal provisions.

§60347. Secondary sedimentation.

All secondary sedimentation unit processes shall be provided with one of the following reliability features:

(a) Multiple sedimentation units capable of treating the entire flow with one unit not in operation.

(b) Standby sedimentation unit process.

(c) Long-term storage or disposal provisions.

§60349. Coagulation.

(a) All coagulation unit processes shall be provided with the following mandatory features for uninterrupted coagulant feed:

(1) Standby feeders,
(2) Adequate chemical stowage and conveyance facilities,
(3) Adequate reserve chemical supply, and
(4) Automatic dosage control.

(b) All coagulation unit processes shall be provided with one of the following reliability features:

(1) Alarm and multiple coagulation units capable of treating the entire flow with one unit not in operation;

(2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;

(3) Alarm and long-term storage or disposal provisions;

(4) Automatically actuated long-term storage or disposal provisions, or

(5) Alarm and standby coagulation process.

§60351. Filtration.

All filtration unit processes shall be provided with one of the following reliability features:

(a) Alarm and multiple filter units capable of treating the entire flow with one unit not in operation.

(b) Alarm, short-term retention or disposal provisions and standby replacement equipment.

(c) Alarm and long-term storage or disposal provisions.

(d) Automatically actuated long-term storage or disposal provisions.

(e) Alarm and standby filtration unit process.

§60353. Disinfection.

(a) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with the following features for uninterrupted chlorine feed:

(1) Standby chlorine supply,

(2) Manifold systems to connect chlorine cylinders,

(3) Chlorine scales, and

(4) Automatic devices for switching to full chlorine cylinders. Automatic residual control of chlorine dosage, automatic measuring and recording of chlorine residual, and hydraulic performance studies may also be required.

(b) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with one of the following reliability features:

(1) Alarm and standby chlorinator;

(2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;

(3) Alarm and long-term storage or disposal provisions;

(4) Automatically actuated long-term storage or disposal provisions; or

(5) Alarm and multiple point chlorination, each with independent power source, separate chlorinator, and separate chlorine supply.

§60355. Other alternatives to reliability requirements

Other alternatives to reliability requirements set forth in Articles 8 to 10 may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the proposed alternative will assure an equal degree of reliability.

* * * * *

APPENDIX C

Fire Code, Regulation 8

Los Angeles County Fire Code, Regulation #8

Fire Flow and Hydrant Requirements (V7-C1-S8)

I. INTRODUCTION

A. Purpose: To provide Department standards for fire flow, hydrant spacing and specifications.

B. Scope: Informational to the general public and instructional to all individuals, companies, or corporations involved in the subdivision of land, construction of buildings, or alterations and/or installation of fire protection water systems and hydrants.

C. Author: The Deputy Chief of the Prevention Services Bureau through the Assistant Fire Chief (Fire Marshal) of the Fire Prevention Division is responsible for the origin and maintenance of this regulation.

D. Definitions:

1. GPM – gallons per minute

2. psi – pounds per square inch

3. Detached condominiums – single detached dwelling units on land owned in common

4. Multiple family dwellings – three or more dwelling units attached

II. RESPONSIBILITY

A. Land Development Unit

1. The Department's Land Development Unit shall review all subdivisions of land and apply fire flow and hydrant spacing requirements in accordance with this regulation and the present zoning of the subdivision or allowed land use as approved by the County's Regional Planning Commission or city planning department.

B. Fire Prevention Engineering Section

1. The Department's Fire Prevention Engineering Section shall review building plans and apply fire flow and hydrant spacing requirements in accordance with this regulation.

III. POLICY

A. The procedures, standards, and policies contained herein are provided to ensure the adequacy of, and access to, fire protection water and shall be enforced by all Department personnel.

IV. PROCEDURES

A. Land development: fire flow, duration of flow, and hydrant spacing

The following requirements apply to land development issues such as: tract and parcel maps, conditional use permits, zone changes, lot line adjustments, planned unit developments, etc.

		Fire Flow	Duration of Flow	Public Hydrant Spacing
1.	Residential Fire Zones 3 Very High Fire Hazard Severity Zone (VHFHSZ)			
a.	Single family dwelling and detached condominiums (1 – 4 Units) (Under 5,000 square feet)	1,250 GPM	2 hrs.	600 ft.
b.	Detached condominium (5 or more units) (Under 5,000 square feet)	1,500 GPM	2 hrs.	300 ft.
c.	Two family dwellings (Duplexes)	1,500 GPM	2 hrs.	600 ft.

NOTE: FOR SINGLE FAMILY DWELLINGS OVER 5,000 SQUARE FEET. SEE, TABLE 1 FOR FIRE FLOW REQUIREMENTS PER BUILDING SIZE.

2. Multiple family dwellings, hotels, high rise, commercial, industrial, etc.

a. Due to the undetermined building designs for new land development projects ***(undeveloped land)***, the required fire flow shall be: 5,000 GPM 5 hrs. 300 ft.

NOTE: REDUCTION IN FIRE FLOW IN ACCORDANCE WITH TABLE 1.

b. Land development projects consisting of lots having existing structures shall be in compliance with Table 1 (fire flow per building size). This standard applies to multiple family dwellings, hotels, high rise, commercial, industrial, etc.

NOTE: FIRE FLOWS PRECEDING ARE MEASURED AT 20 POUNDS PER SQUARE INCH RESIDUAL PRESSURE.

B. Building plans

The Department's Fire Prevention Engineering Section shall review building plans and apply fire flow requirements and hydrant spacing in accordance with the following:

1. Residential

Building Occupancy Classification	Fire Flow	Duration of Flow	Public Hydrant Spacing
a. Single family dwellings - Fire Zone 3 (Less than 5000 square feet)			
On a lot of one acre or more	750 GPM	2 hrs.	600 ft.
On a lot less than one acre	1,250 GPM	2 hrs	600 ft.
b. Single family dwellings - VHFHSZ (Less than 5,000 square feet)			
On a lot of one acre or more	1,000 GPM	2 hrs.	600 ft.
On lots less than one acre	1,250 GPM	2 hrs.	600 ft.

NOTE: FOR SINGLE FAMILY DWELLINGS GREATER THAN 5,000 SQUARE FEET IN AREA SEE TABLE

c. Two-family dwelling units

Duplexes	1,500 GPM	2 hrs.	600 ft.

2. Mobile home park

a. Recreation bldg.	Refer to Table 1 for fire flow according to building size		
b. Mobile home park	1,250 GPM	2 hrs.	600 ft.

3. Multiple residential, apartments, single family residences (greater than 5,000 square feet), private schools, hotels, high rise, commercial, industrial, etc. (R-1, E, B, A, I, H, F, M, S) (see Table 1).

C. Public fire hydrant requirements

1. Fire hydrants shall be required at intersections and along access ways as spacing requirements dictate.

2. Spacing

a. Cul-de-sac

When cul-de-sac depth exceeds 450' (residential) or 200' (commercial), hydrants shall be required at mid-block. Additional hydrants will be required if hydrant spacing exceeds specified distances.

b. Single family dwellings

Fire hydrant spacing of 600 feet

NOTE: The following guidelines shall be used in meeting single family dwellings hydrant spacing requirements:

(1) Urban properties (more than one unit per acre): No portion of lot frontage should be more than 450' via vehicular access from a public hydrant.

(2) Non-Urban Properties (less than one unit per acre):
No portion of a structure should be placed on a lot where it exceeds 750' via vehicular access from a properly spaced public hydrant that meets the required fire flow.

c. All occupancies

Other than single family dwellings, such as commercial, industrial, multi-family dwellings, private schools, institutions, detached condominiums (five or more units), etc.

Fire hydrant spacing shall be 300 feet.

NOTE: The following guidelines shall be used in meeting the hydrant spacing requirements.

(1) No portion of lot frontage shall be more than 200 feet via vehicular access from a public hydrant.

(2) No portion of a building should exceed 400 feet via vehicular access from a properly spaced public hydrant.

d. Supplemental fire protection

When a structure cannot meet the required public hydrant spacing distances, supplemental fire protection shall be required.

NOTE: Supplemental fire protection is not limited to the installation of on-site fire hydrants; it may include automatic extinguishing systems.

3. Hydrant location requirements - both sides of a street

Hydrants shall be required on both sides of the street whenever:

a. Streets having raised median center dividers that make access to hydrants difficult, causes time delay, and/or creates undue hazard.

b. For situations other than those listed in "a" above, the Department's inspector's judgment shall be used. The following items shall be considered when determining hydrant locations:

(1) Excessive traffic loads, major arterial route, in which traffic would be difficult to detour.

(2) Lack of adjacent parallel public streets in which traffic could be redirected (e.g., Pacific Coast Highway).

(3) Past practices in the area.

(4) Possibility of future development in the area.

(5) Type of development (i.e., flag-lot units, large apartment or condo complex, etc.).

(6) Accessibility to existing hydrants

(7) Possibility of the existing street having a raised median center divider in the near future.

D. On-site hydrant requirements

1. When any portion of a proposed structure exceeds (via vehicular access) the allowable distances from a public hydrant and on-site hydrants are required, the following spacing requirements shall be met:

a. Spacing distance between on-site hydrants shall be 300 to 600 feet.

(1) Design features shall assist in allowing distance modifications.

b. Factors considered when allowing distance modifications.

(1) Only sprinklered buildings qualify for the maximum spacing of 600 feet.

(2) For non-sprinklered buildings, consideration should be given to fire protection, access doors, outside storage, etc. Distance between hydrants should not exceed 400 feet.

2. Fire flow

a. All on-site fire hydrants shall flow a minimum of 1,250 gallons per minute at 20 psi for a duration of two hours. If more than one on-site fire hydrant is required, the on-site fire flow shall be at least 2,500 gallons per minute at 20 psi, flowing from two hydrants simultaneously. On site flow may be greater depending upon the size of the structure and the distance from public hydrants.

NOTE: ONE OF THE TWO HYDRANTS TESTED SHALL BE THE FARTHEST FROM THE PUBLIC WATER SOURCE.

3. Distance from structures

All on-site hydrants shall be installed a minimum of 25 feet from a structure or protected by a two-hour firewall.

4. Shut-off valves

All on-site hydrants shall be equipped with a shut-off (gate) valve, which shall be located as follows:

a. Minimum distance to the hydrant 10 feet

b. Maximum distance from the hydrant 25 feet

5. Inspection of new installations

All new on-site hydrants and underground installations are subject to inspection of the following items by a representative of the Department:

a. Piping materials and the bracing and support thereof.

b. A hydrostatic test of 200 psi for two hours.

c. Adequate flushing of the installation.

d. Flow test to satisfy required fire flow.

(1) Hydrants shall be painted with two coats of red primer and one coat of red paint, with the exception of the stem and threads, prior to flow test and acceptance of the system.

6. Maintenance

It shall be the responsibility of the property management company, the homeowners association, or the property owner to maintain on-site hydrants.

a. Hydrants shall be painted with two coats of red primer and one coat of red, with the exception of the stem and threads, prior to flow test and acceptance of the system.

b. No barricades, walls, fences, landscaping, etc., shall be installed or planted within three feet of a fire hydrant.

E. Public hydrant flow procedure

The minimum acceptable flow from any existing public hydrant shall be 1,000 GPM unless the required fire flow is less. Hydrants used to satisfy fire flow requirements will be determined by the following items:

1. Only hydrants that meet spacing requirements are acceptable for meeting fire flow requirements.

2. In order to meet the required fire flow:

   a. Flow closest hydrant and calculate to determine flow at 20 pounds per square inch residual pressure. If the calculated flow does not meet the fire flow requirement, the next closest hydrant shall be flowed simultaneously with the first hydrant, providing it meets the spacing requirement, etc.

   b. If more than one hydrant is to be flowed in order to meet the required fire flow, the number of hydrants shall be flowed as follows:

One hydrant	1,250 GPM and below
Two hydrants	1,251– 3,500 GPM flowing simultaneously
Three hydrants	3,501– 5,000 GPM flowing simultaneously

F. Hydrant upgrade policy

1. Existing single outlet 2 1/2" inch hydrants shall be upgraded to a double outlet 6" x 4" x 2 1/2" hydrant when the required fire flow exceeds 1,250 GPM.

2. An upgrade of the fire hydrant will not be required if the required fire flow is between the minimum requirement of 750 gallons per minute, up to and including 1,250 gallons per minute, and the existing public water system will provide the required fire flow through an existing wharf fire hydrant.

3. All new required fire hydrant installations shall be approved 6" x 4" x 2 1/2" fire hydrants.

4. When water main improvements are required to meet GPM flow, and the existing water main has single outlet 2 1/2" fire hydrant(s), then a hydrant(s) upgrade will be required. This upgrade shall apply regardless of flow requirements.

G. Hydrant specifications

All required public and on-site fire hydrants shall be installed to the following specifications prior to flow test and acceptance of the system.

1. Hydrants shall be:

   a. Installed so that the center line of the lowest outlet is between 14 and 24 inches above finished grade

   b. Installed so that the front of the riser is between 12 and 24 inches behind the curb face

   c. Installed with outlets facing the curb at a 45-degree angle to the curb line if there are double outlet hydrants

   d. Similar to the type of construction which conforms to current A.W.W.A. Standards

   e. Provided with three-foot unobstructed clearance on all sides

   f. Provided with approved plastic caps

   g. Painted with two coats of red primer and one coat of traffic signal yellow for public hydrants and one coat of red for on-site hydrants, with the exception of the stems and threads

2. Underground shut-off valves are to be located:

   a. A minimum distance of 10 feet from the hydrant

   b. A maximum distance of 25 feet from the hydrant

      Exception: Location can be less than 10 feet when the water main is already installed and the 10-foot minimum distance cannot be satisfied.

3. All new water mains, laterals, gate valves, buries, and riser shall be a minimum of six inches inside diameter.

4. When sidewalks are contiguous with a curb and are five feet wide or less, fire hydrants shall be placed immediately behind the sidewalk. Under no circumstances shall hydrants be more than six feet from a curb line.

5. The owner-developer shall be responsible for making the necessary arrangements with the local water purveyor for the installation of all public facilities.

6. Approved fire hydrant barricades shall be installed if curbs are not provided (see Figures 1, 2, and 3 following on pages 11 and 12).

Barricade/Clearance Details

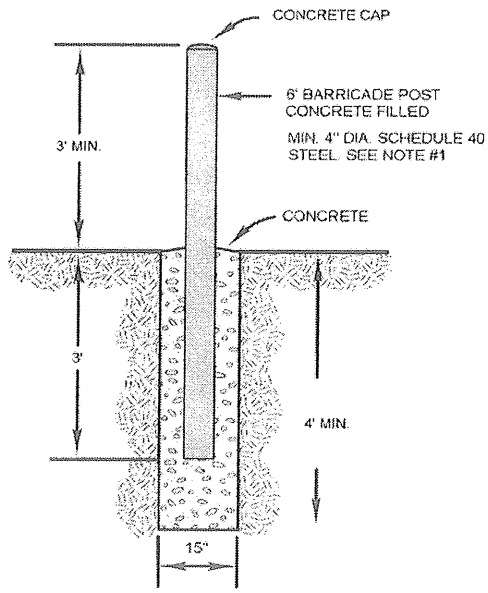
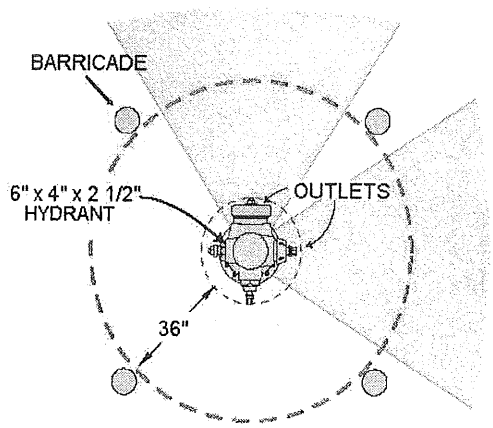


Figure 1



PLAN
FIRE HYDRANT BARRICADES
(TYPICAL)

Figure 2

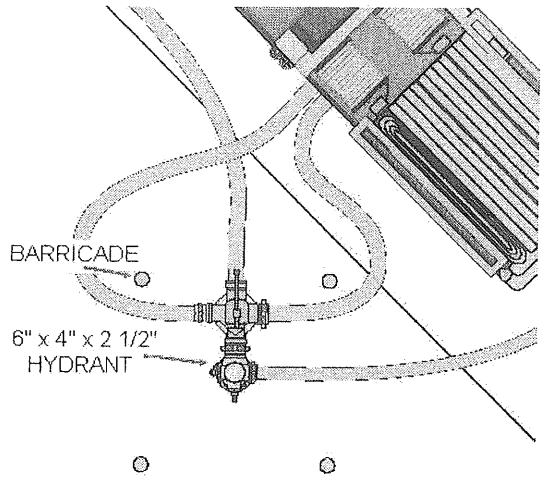


Figure 3

Notes:

1. Constructed of steel not less than four inches in diameter, six inches if heavy truck traffic is anticipated, schedule 40 steel and concrete filled.

2. Posts shall be set not less than three feet deep in a concrete footing of not less than 15 inches in diameter, with the top of the posts not less than three feet above ground and not less than three feet from the hydrant

3. Posts, fences, vehicles, growth, trash storage and other materials or things shall not be placed or kept near fire hydrants in a manner that would prevent fire hydrants from being immediately discernable.

4. If hydrant is to be barricaded, no barricade shall be constructed in front of the hydrant outlets (Figure 2, shaded area).

5. The exact location of barricades may be changed by the field inspector during a field inspection.

6. The steel pipe above ground shall be painted a minimum of two field coats of primer.

7. Two finish coats of "traffic signal yellow" shall be used for fire hydrant barricades.

8. Figure 3 shows hydrant hook up during fireground operations. Notice apparatus (hydra-assist-valve) connected to hydrant and the required area. Figure 3 shows the importance of not constructing barricades or other obstructions in front of hydrant outlets.

H. Private fire protection systems for rural commercial and industrial development

Where the standards of this regulation cannot be met for industrial and commercial developments in rural areas, alternate proposals which meet NFPA Standard 1142 may be submitted to the Fire Marshal for review. Such proposals shall also be subject to the following:

1. The structure is beyond 3,000 feet of any existing, adequately-sized water system.

    a. Structures within 3,000 feet of an existing, adequately-sized water system, but beyond a water purveyor service area, will be reviewed on an individual basis.

2. The structure is in an area designated by the County of Los Angeles' General Plan as rural non-urban.

I. Blue reflective hydrant markers replacement policy

1. Purpose: To provide information regarding the replacement of blue reflective hydrant markers, following street construction or repair work.

    a. Fire station personnel shall inform Department of Public Works Road Construction Inspectors of the importance of the blue reflective hydrant markers, and encourage them to enforce their Department permit requirement, that streets and roads be returned to their original condition, following construction or repair work.

    b. When street construction or repair work occurs within this Department's jurisdiction, the nearest Department of Public Works Permit Office shall be contacted. The location can be found by searching for the jurisdiction office in the "County of Los Angeles Telephone Directory" under "Department of Public Works Road Maintenance Division." The importance of the blue reflective hydrant markers should be explained, and the requirement encouraged that the street be returned to its original condition, by replacing the hydrant markers.

TABLE 1 *

BUILDING SIZE (First floor area)	Fire Flow *(1) (2)	Duration	Hydrant Spacing
Under 3,000 sq. ft.	1,000 GPM	2 hrs.	300 ft.
3,000 to 4,999 sq. ft.	1,250 GPM	2 hrs.	300 ft.
5,000 to 7,999 sq. ft.	1,500 GPM	2 hrs.	300 ft.
8,000 to 9,999 sq. ft.	2,000 GPM	2 hrs.	300 ft.
10,000 to 14,999 sq. ft.	2,500 GPM	2 hrs.	300 ft.
15,000 to 19,999 sq. ft.	3,000 GPM	3 hrs.	300 ft.
20,000 to 24,999 sq. ft.	3,500 GPM	3 hrs.	300 ft.
25,000 to 29,999 sq. ft.	4,000 GPM	4 hrs.	300 ft.
30,000 to 34,999 sq. ft.	4,500 GPM	4 hrs.	300 ft.
35,000 or more sq. ft.	5,000 GPM	5 hrs.	300 ft.

* See applicable footnotes below:

(FIRE FLOWS MEASURED AT 20 POUNDS PER SQUARE INCH RESIDUAL PRESSURE)

(1) Conditions requiring additional fire flow.

a. Each story above ground level - add 500 GPM per story.

b. Any exposure within 50 feet - add a total of 500 GPM.

c. Any high-rise building (as determined by the jurisdictional building code) the fire flow shall be a minimum of 3,500 GPM for 3 hours at 20 psi.

d. Any flow may be increased up to 1,000 GPM for a hazardous occupancy.

(2) Reductions in fire flow shall be cumulative for type of construction and a fully sprinklered building. The following allowances and/or additions may be made to standard fire flow requirements:

a. A 25% reduction shall be granted for the following types of construction: Type I-F.R, Type II-F.R., Type II one-hour, Type II-N, Type III one-hour, Type III-N, Type IV, Type IV one hour, and Type V one-hour. This reduction shall be automatic and credited on all projects using these types of construction. Credit will not be given for Type V-N structures (to a minimum of 2,000 GPM available fire flow).

b. A 25% reduction shall be granted for fully sprinklered buildings (to a minimum of 2,000 GPM available fire flow).

c. When determining required fire flows for structures that total 70,000 square feet or greater, such flows shall not be reduced below 3,500 GPM at 20 psi for three hours.

APPENDIX D

Raw Fire Flow Data

Fire Flow Field Notes

District: CIWS
Date: 11/22/2016
Time:
Hydrant Test No. 1 /7
Field Technician:

Location Information

Pressure Zone: 1
District Atlas Map Page: B5

Street Where Hydrant is Located: San Angelo Ave.
Nearest Cross Street: Levelwood St.
Location of Hydrant: NE corner of San Angelo and Levelwood St.

Field Data

Size of Hydrant (in.):	6" to 4"		Diameter of Outlet (in.):	2.5
Elevation of Hydrant :	283	ft	C Factor:	0.9
Fire Flow at Hydrant:	992.6812121	gpm	Pitot Pressure (psi):	35
Residual Pressure:	80	psi	Static Pressure (psi):	95

Reservoir Data

Name of Reservoir:	Lomitas		Name of Reservoir:	Ind. Hills
Water Level at Reservoir:	26	ft	Water Level at Reservoir:	30.3

Pump Data

Are Pump Stations ON? YES NO

(If Yes, answer below)

Pump Station Name: Lomitas Booster Station
Pump No: 1
Flow at Pump Station: 1440 gpm
Pressure at Pump Station: 42 psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Interconnections

Are Interconnections ON? YES NO

(If Yes, answer below)

Name of Interconnection: Lomitas/Workman
Flow at Interconnection: 450 gpm
Pressure at Interconnection: N/A psi

Other

Remarks/Comments: Formula Used to Calulate Fire Flow : $Q = 29.83 * D^2 * C * \sqrt{P_t}$
HydrantPro Diffuser used to measure pitot reading with C factor of 0.9 (provided by manuf.)

Fire Flow Field Notes

District: CIWS
Date: 11/22/2016
Time:
Hydrant Test No. 2 / 7
Field Technician:

Location Information

Pressure Zone: 1
District Atlas Map Page: B6

Street Where Hydrant is Located: 934 Cunningham Dr
Nearest Cross Street: CHANGED to 934 Cunningham Dr.
Location of Hydrant: CHANGED to 934 Cunningham Dr.

Field Data

Size of Hydrant (in.):	4"		Diameter of Outlet (in.):	2.5
Elevation of Hydrant :	331	ft	C Factor:	0.9
Fire Flow at Hydrant:	963.9017086	gpm	Pitot Pressure (psi):	33
Residual Pressure:	60	psi	Static Pressure (psi):	75

Reservoir Data

Name of Reservoir:	Lomitas		Name of Reservoir:	Ind. Hills
Water Level at Reservoir:	25.8	ft	Water Level at Reservoir:	30.4

Pump Data

Are Pump Stations ON? YES NO

(If Yes, answer below)

Pump Station Name: Lomitas Booster Station
Pump No: 1
Flow at Pump Station: 1447 gpm
Pressure at Pump Station: 42 psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Interconnections

Are Interconnections ON? YES NO

(If Yes, answer below)

Name of Interconnection: Workman Mill and Lomitas
Flow at Interconnection: 300 gpm
Pressure at Interconnection: 55 psi

Other

Remarks/Comments: Formula Used to Calulate Fire Flow : $Q = 29.83 * D^2 * C * \sqrt{P_t}$
HydrantPro Diffuser used to measure pitot reading with C factor of 0.9 (provided by manuf.)
Hudson inflow increased by 300 gpm

Fire Flow Field Notes

District: CIWS
Date: 11//22/16
Time:
Hydrant Test No. 3 / 7
Field Technician:

Location Information

Pressure Zone: 1
District Atlas Map Page: C7

Street Where Hydrant is Located: S. 4th St.
Nearest Cross Street: E. Lomitas Ave.
Location of Hydrant: SE corner of S. 4th Ave. and E. Lomitas Ave.

Field Data

Size of Hydrant (in.):	6		Diameter of Outlet (in.):	2.5
Elevation of Hydrant :	384	ft	C Factor:	0.9
Fire Flow at Hydrant:	903.5969974	gpm	Pitot Pressure (psi):	29
Residual Pressure:	49	psi	Static Pressure (psi):	58

Reservoir Data

Name of Reservoir:	Lomitas		Name of Reservoir:	Ind. Hills
Water Level at Reservoir:	25.9	ft	Water Level at Reservoir:	30.4

Pump Data

Are Pump Stations ON? YES NO

(If Yes, answer below)

Pump Station Name: Lomitas Booster Station
Pump No: 1
Flow at Pump Station: 1460 gpm
Pressure at Pump Station: 40.5 psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Interconnections

Are Interconnections ON? YES NO

(If Yes, answer below)

Name of Interconnection:	Valley Blvd		Name of Interconnection:	WM/Lomitas
Flow at Interconnection:	0	gpm	Flow at Interconnection:	0
Pressure at Interconnection:	0	psi	Pressure at Interconnection:	0

Other

Remarks/Comments: Formula Used to Calulate Fire Flow : $Q = 29.83 * D^2 * C * \sqrt{P_t}$
HydrantPro Diffuser used to measure pitot reading with C factor of 0.9 (provided by manuf.)

Fire Flow Field Notes

District: CIWS
Date: 11/22/2016
Time:
Hydrant Test No. 4 / 7
Field Technician:

Location Information

Pressure Zone: 1
District Atlas Map Page: F7

Street Where Hydrant is Located: Proctor Ave
Nearest Cross Street: 6th St.
Location of Hydrant: Proctor and 6th Intersection

Field Data

Size of Hydrant:	6		Diameter of Outlet (in.):	2.5
Elevation of Hydrant :	296	ft	C Factor:	0.9
Fire Flow at Hydrant:	1288.848249	gpm	Pitot Pressure (psi):	59
Residual Pressure:	84	psi	Static Pressure (psi):	88

Reservoir Data

Name of Reservoir:	Lomitas		Name of Reservoir:	Ind. Hills
Water Level at Reservoir:	26	ft	Water Level at Reservoir:	25.2

Pump Data

Are Pump Stations ON? YES NO

(If Yes, answer below)

Pump Station Name: Lomitas Booster Station
Pump No: 1
Flow at Pump Station: 1460 gpm
Pressure at Pump Station: 42 psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Interconnections

Are Interconnections ON? YES NO

(If Yes, answer below)

Name of Interconnection:	Valley Blvd		Name of Interconnection:	WM/Lomitas
Flow at Interconnection:	150	gpm	Flow at Interconnection:	N/A
Pressure at Interconnection:	74	psi	Pressure at Interconnection:	

Other

Remarks/Comments: Formula Used to Calulate Fire Flow : $Q = 29.83 * D^2 * C * \sqrt{P_t}$
HydrantPro Diffuser used to measure pitot reading with C factor of 0.9 (provided by manuf.)

Fire Flow Field Notes

District: CIWS
Date:
Time:
Hydrant Test No. 5 / 7
Field Technician:

Location Information

Pressure Zone: Lake Loop
District Atlas Map Page: J9

Street Where Hydrant is Located: BV Handorf Drr
Nearest Cross Street: Private Road (in Lake Loop Area)
Location of Hydrant: 800 ft. west of Private Road

Field Data

Size of Hydrant (in.):	6		Diameter of Outlet (in.):	2.5
Elevation of Hydrant :	691	ft	C Factor:	0.9
Fire Flow at Hydrant:	750.3964624	gpm	Pitot Pressure (psi):	20
Residual Pressure:	34	psi	Static Pressure (psi):	72

Reservoir Data

Name of Reservoir:	Ind. Hills		Name of Reservoir:	
Water Level at Reservoir:	25.2	ft	Water Level at Reservoir:	

Pump Data

Are Pump Stations ON? YES NO

(If Yes, answer below)

Pump Station Name: Handorf Booster Station
Pump No: 1 & 2
Flow at Pump Station: 315 gpm
Pressure at Pump Station: 31 psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Interconnections

Are Interconnections ON? YES NO

(If Yes, answer below)

Name of Interconnection:	Not used		Name of Interconnection:	Not used
Flow at Interconnection:		gpm	Flow at Interconnection:	
Pressure at Interconnection:		psi	Pressure at Interconnection:	

Other

Remarks/Comments: Formula Used to Calulate Fire Flow : $Q = 29.83 * D^2 * C * \sqrt{P_t}$
HydrantPro Diffuser used to measure pitot reading with C factor of 0.9 (provided by manuf.)

Fire Flow Field Notes

District: CIWS
Date:
Time:
Hydrant Test No. 6 / 7
Field Technician:

Location Information

Pressure Zone: Industry Hills
District Atlas Map Page: I8

Street Where Hydrant is Located: Expo Center Dr.
Nearest Cross Street: CHANGED
Location of Hydrant: About 300' East of Avalon Room

Field Data

Size of Hydrant (in.): 6
Elevation of Hydrant : 468 ft
Fire Flow at Hydrant: 1150.335994 gpm
Residual Pressure: 72 psi

Diameter of Outlet (in.): 2.5
C Factor: 0.9
Pitot Pressure (psi): 47
Static Pressure (psi): 75

Reservoir Data

Name of Reservoir: Ind. Hills
Water Level at Reservoir: 25.1 ft

Name of Reservoir: PS #2 Reservoir
Water Level at Reservoir: 6.7 to 5.9 (opened CLAVal to refill

Pump Data

Are Pump Stations ON? YES NO

(If Yes, answer below)

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Interconnections

Are Interconnections ON? YES NO

(If Yes, answer below)

Name of Interconnection: ClaVal on West Road
Flow at Interconnection: N/A gpm
Pressure at Interconnection: 45 to 40 then to 45 psi

Name of Interconnection:
Flow at Interconnection:
Pressure at Interconnection:

Other

Remarks/Comments: Formula Used to Calulate Fire Flow : $Q = 29.83 * D^2 * C * \sqrt{P_t}$
HydrantPro Diffuser used to measure pitot reading with C factor of 0.9 (provided by manuf.)

Fire Flow Field Notes

District: CIWS
Date:
Time:
Hydrant Test No. 7 / 7
Field Technician:

Location Information

Pressure Zone: Industry Hills
District Atlas Map Page: J10

Street Where Hydrant is Located: Industry Hills Parkway
Nearest Cross Street: Next to hotel
Location of Hydrant: In parking lot hotel

Field Data

Size of Hydrant (in.): 6
Elevation of Hydrant : 653 ft
Fire Flow at Hydrant: 1074.404228 gpm
Residual Pressure: 58 psi

Diameter of Outlet (in.): 2.5
C Factor: 0.9
Pitot Pressure (psi): 41
Static Pressure (psi): 60

Reservoir Data

Name of Reservoir:
Water Level at Reservoir: ft

Name of Reservoir:
Water Level at Reservoir:

Pump Data

Are Pump Stations ON? YES NO

(If Yes, answer below)

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Pump Station Name:
Pump No:
Flow at Pump Station: gpm
Pressure at Pump Station: psi

Interconnections

Are Interconnections ON? YES NO

(If Yes, answer below)

Name of Interconnection:
Flow at Interconnection: gpm
Pressure at Interconnection: psi

Name of Interconnection:
Flow at Interconnection:
Pressure at Interconnection:

Other

Remarks/Comments: Formula Used to Calulate Fire Flow : $Q = 29.83 * D^2 * C * \sqrt{P_t}$
HydrantPro Diffuser used to measure pitot reading with C factor of 0.9 (provided by manuf.)

APPENDIX E

Deficiency Improvements

Exhibit 1: Starhill Ln & 3rd Ave Waterline Improvement

Location of 3rd Ave. & Starhill Ln. Waterline Improvement

Exhibit 2: Lomitas Lane Improvements

Upsizing approximately 1,130 ft. of pipeline to 8-inch DIP

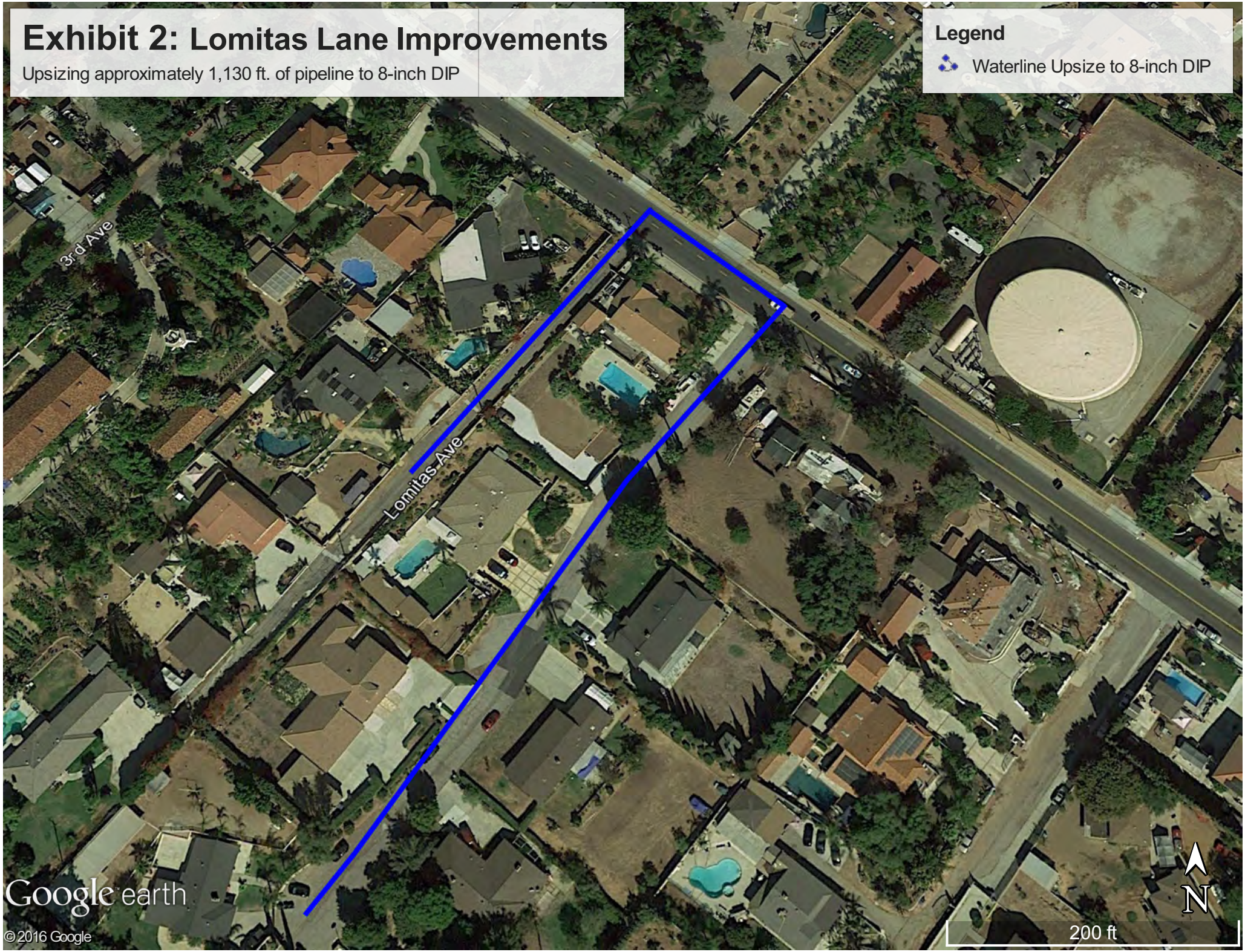


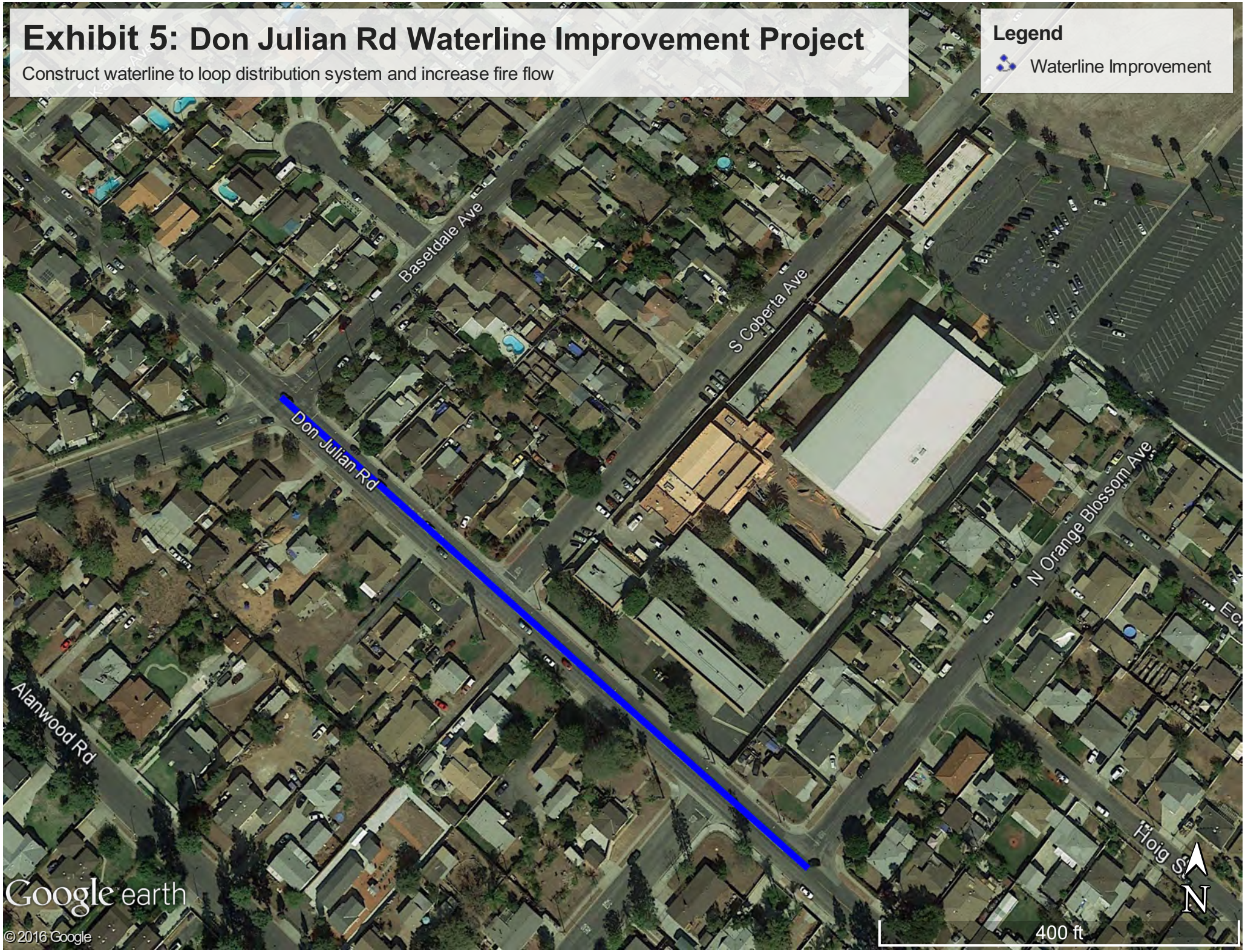
Exhibit 3: 4th Avenue Waterline Improvement Project

Construct waterline to loop distribution system and increase fire flow


Exhibit 4: Siesta Avenue Improvements
Upsize approximately 650 ft. to 6-inch DIP
Legend
Waterline Upsize to 6-inch DIP
Oranut Ln
Proctor Ave
Siesta Ave
Google earth
© 2016 Google
N
200 ft

Exhibit 5: Don Julian Rd Waterline Improvement Project

Construct waterline to loop distribution system and increase fire flow



APPENDIX F

PVOU Water Supply

Civil, Water, Wastewater, Drainage and Transportation Engineering
Construction Management ● Surveying
California ● Arizona

August 5, 2016

La Puente Valley County Water District
112 North First Street
La Puente, CA 91744

Attention: Greg B. Galindo, General Manager

Subject: Water Analysis and Study for PVOU Intermediate Zone Project

Dear Mr. Galindo:

CIVILTEC engineering, inc. (Civiltec) has completed the water analysis and study for the Puente Valley Operable Unit (PVOU) intermediate zone project per the project scope of work agreement. Our analysis goal is to accommodate the development of the PVOU project water with its incorporation into the La Puente Valley County Water District (LPVCWD) and City of Industry Waterworks System (CIWS) water systems with ultimate delivery of the project water to the Rowland Water District (RWD). A summary of the existing water systems and the required system improvements for delivering the water to RWD are provided herein.

The investigation considered the current water demand for CIWS and LPVCWD systems as well as the distribution system components that can potentially be utilized or may be impacted in order to convey water from the PVOU treatment facility through the CIWS or LPVCWD systems to RWD. Two alternatives were considered, Alternative A and Alternative B. In Alternative A, two interconnects will be upgraded or constructed and new pumps will be installed at Industry Hills pump station numbers 1 and 2. In addition, a new chloramination facility will be installed. In Alternative B, two interconnects will be constructed and upgraded, a new booster pump station will be constructed at the LPVCWD Main Street reservoir site, a chloramination facility will also be installed, and a new transmission line will be constructed.

Water Demand

The current water demand for LPVCWD and CIWS system was analyzed based on the production data between 2010 and 2015 for consideration in the effort. The ADD, MDD and PHD are calculated and summarized in following tableError! Reference source not found..

Table 1 – Production Data for LPVCWD and CIWS

	LP		CIWS	
Unit	MGD	GPM	MGD	GPM
ADD	1.55	1,075	1.20	833
MDD	3.42	2,373	2.89	2,006
PHD	5.13	3,559	4.33	3,009

The future water demand in the near term condition (i.e. the next 5 years) was analyzed using the population projection data provided by the City of La Puente and City of Industry, which is estimated to be a 1% increase per year. The maximum daily water supply to RWD from the PVOU IZ treatment facility is 1,750 gpm.

Pipeline Alignments

Water pipeline alignments to deliver the water from the PVOU IZ treatment facility to RWD interconnection are described below.

Alternative A

In Alternative A, the water system is composed of several elements such as interconnections, pipelines (CIWS 18" and 16" and New Waterline 12"), upgrades at Industry Hills pump station Nos. 1, 2 and 3 and the Industry Hills Reservoirs.

The water from PVOU IZ treatment facility is delivered to RWD connection through existing CIWS 16" and 18" pipelines and the New 12" water mains by way of the existing and proposed pumps at two CIWS pump stations. In this alternative, three different interconnections must be constructed or upgraded. In addition, this alternative assumes the use of LPVCWD's 16" from the Industry Hills Pump Station No. 3 to the new interconnection with RWD, operating at a greater pressure than it is currently subject and potentially greater than the current piping pressure rating for several hundred feet. The improvements envisioned as needed for this alternative are summarized below and are presented in **Figure 1**.

- Construction of a 12" Interconnection between the LPVCWD 14" ACP waterline and the CIWS 18" DI waterline at the south west of Hudson Avenue and Stafford Street consisting of approximately 12" pipe that is 16 feet long.
- Upgrading the Interconnection between the LPVCWD 16" waterline and the CIWS 16" waterline at the Industry Hills Pump Station 1 with a 16" pipe.
- Industry Hills Pump Station No. 1 – Installation of a new vertical turbine pump and Variable Frequency Drive (VFD) motor control panel in the existing pump station.
- Industry Hills Pump Station No. 2 – Installation of a new vertical turbine pump and Variable Frequency Drive (VFD) motor control panel in the existing pump station.

- Upgrading the interconnection between the LPVCWD 16" ACP waterline and the RWD 8" waterline on Azusa Way at Hurley Street with a 12" pipe.
- Reconfiguration of distribution piping to isolate the 16" waterline for primary use of conveying chloraminated PVOU IZ water to RWD. This improvement will include construction of a pressure sustaining valve on an existing 8" distribution pipeline on Main Street. Existing valves located at a point of connection between the 16" waterline and distribution pipelines, at Hurley Street and new Villa Park Street, will need to closed. As a result, functionality to supply from LPVCWD Zone 2 to CIWS through the Industry Hills Pump Station No. 3 will be eliminated. The existing 16" will primarily serve as a transmission pipeline from CIWS to RWD and chloraminated water in this pipe line will only be introduced to the LPVCWD Zone 2 system if the pressure conditions in Zone 2 fall below the set point of the new Pressure Sustaining valve proposed above.
- The pressure sustaining valve currently located at the Industry Hills Pump Station No. 3 will be adjusted to supply higher pressure within the existing 16" LPVCWD water line. This is done in order to deliver higher pressure to the RWD connection. Currently the connection with RWD exhibits a pressure of 110 psi while the LPVCWD system at this same location exhibits a pressure of 90 psi. As a result, the 16" waterline will be subject to pressures on the order of 20 to 30 psi higher than the current condition to enable delivery from LPVCWD to RWD. As a result, there is concern that the integrity of this pipeline may be compromised.
- Construction of a new chloramination facility at the Industry Hills Pump Station No. 3.

The project water will primarily be conveyed through existing 18" and 16" pipelines. When considering maximum day conditions while conveying 1,750 gpm of project water, the general velocity within the pipelines will range between 4.5 and 6 feet per second. Under normal conditions, this is slightly higher than a typical design criteria of 5 feet per second. However, this does not consider the overall network configuration of the existing system which will allow a greater number of flow paths for water to minimize impacts to existing water pipelines.

Alternative B

In Alternative B, the water system is composed of several elements such as interconnections, pipelines (LPVCWD 14" and 16"), a new pump station at the Main Street Reservoir, and new pipelines from the new pump station to the LPVCWD 16" pipeline. Like Alternative A, the water source for this alternative is from the PVOU IZ treatment facility. The water is delivered to RWD connection through LPVCWD 14" and 16" waterline by the proposed pump at the PVOU treatment facility. The improvements envisioned as needed for this alternative are summarized below and are presented in **Figure 2**.

- Construction of a 12" Interconnection between the LPVCWD 14" ACP waterline and CIWS 18" DI waterline at the south west intersection of Hudson Avenue and Stafford Street.
- Main Street Reservoir – Installation of a new pump station equipped with a Variable Frequency Drive (VFD) motor control center, pumps and construction of a chloramination facility.

- 12" transmission line – an approximate 7,000 linear feet transmission line will be constructed from Main Street Reservoir site to the 14" RWD pipeline.
- Upgrading the interconnection between the LPVCWD 16" ACP waterline and the RWD 8" waterline on Azusa Way at Hurley Street with a 12" pipe.

The PVOU project water will be primarily conveyed through LPVCWD system through 14" and 16" water pipelines. When considering conveyance of maximum day demands in the LPVCWD system in addition to the PVOU project water, velocities will approach 5 feet per second. However, this does not consider the overall network configuration of the existing system which will allow a greater number of flow paths for water to minimize impacts to existing water pipelines.

Figure 1 – Layout of Alternative A

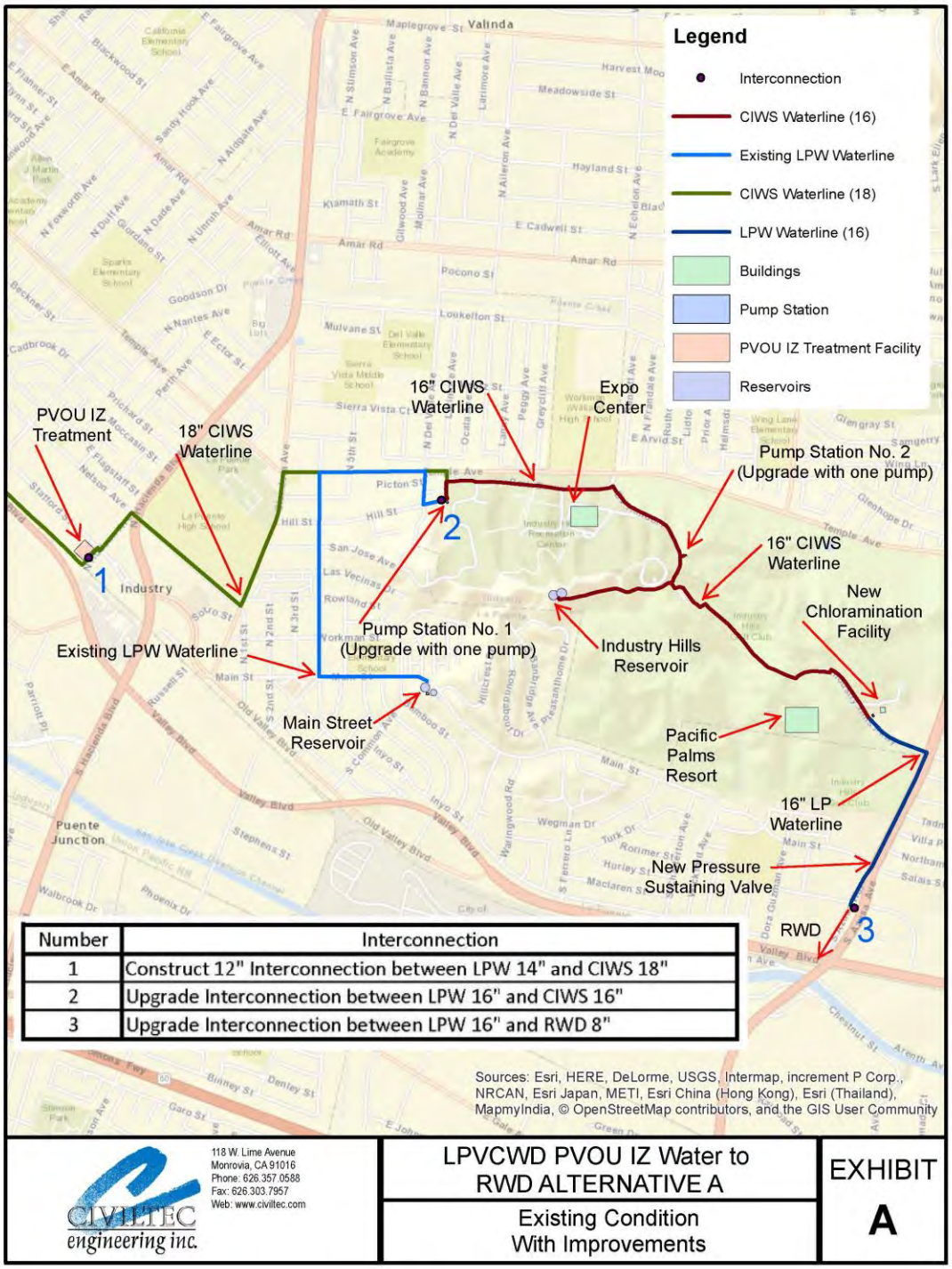
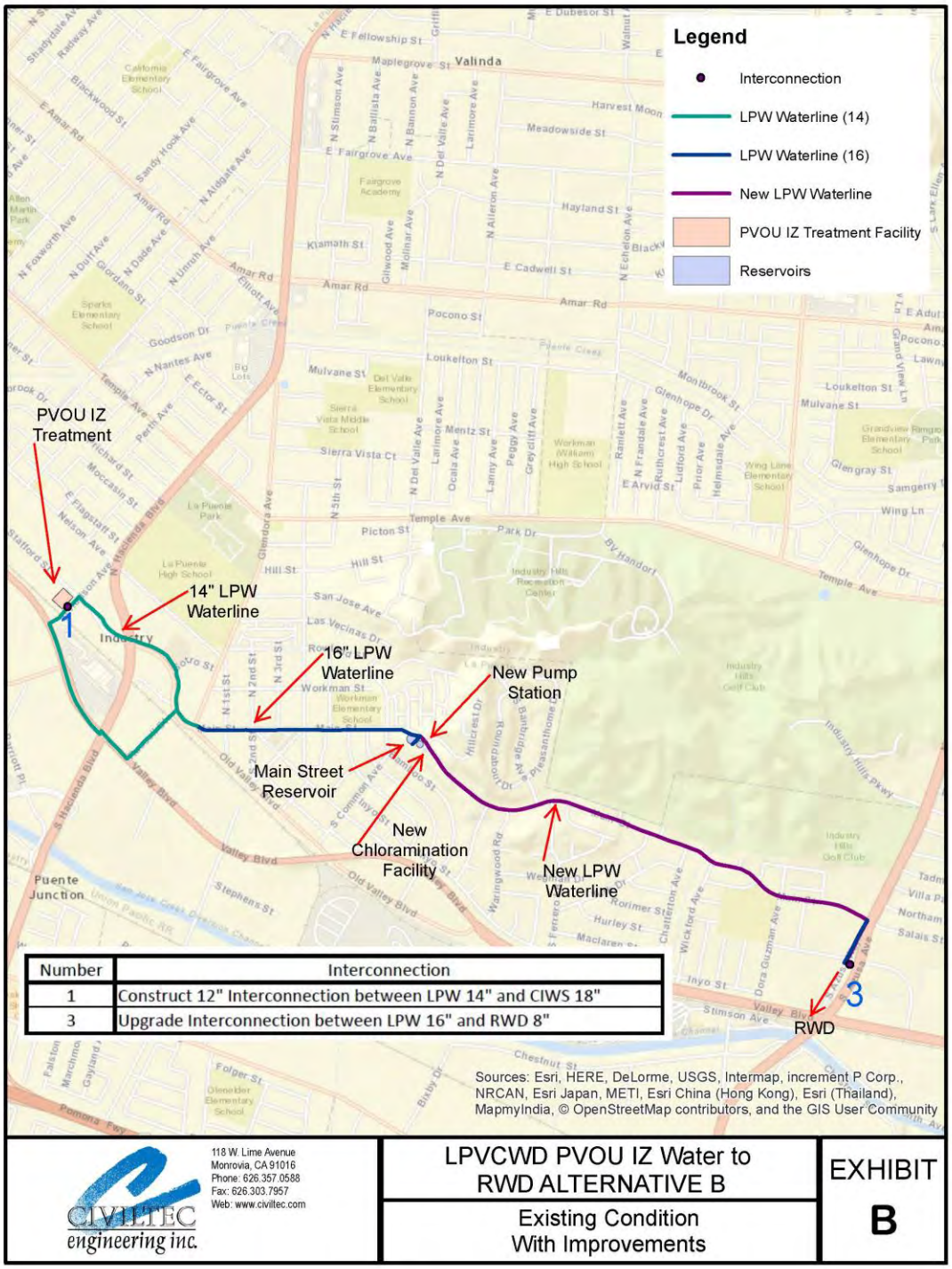


Figure 2 – Layout of Alternative B



Pump Production Analysis

Alternative A

Industry Hills Pump Station Nos. 1 and 2 are comprised of two existing electric driven pumps, a single gas driven pump and an existing empty pump can. There are three pumps in Industry Hills Pump Station No. 3, including two electric driven pumps and one gas driven pump. The gas driven pumps at each station are rarely, if ever, utilized. The specifications of each pump station is described in **Table 2**. Each pump station has a 480-volt electrical service with a 400 amp rated electrical disconnect that provides power to the two existing electrical pumps.

Table 2 – Pump Station Information in Alternative A

Station No.	1			2			3		
PumpNo.	GPM	TDH	HP	GPM	TDH	HP	GPM	TDH	HP
1	1,100	175	75	1,100	195	75	800	175	40
2	1,100	175	75	1,100	195	75	1,100	175	60
3 (Gas)	2,200	175	150	2,200	175	150		175	

The Industry Hills reservoirs supply potable water from CIWS Zone 1 via Industry Hills Pump Station No. 1 and No. 2. Pump station No. 1 can also supply water via a new interconnection with LPVCWD's Zone 1 service area through a LPVCWD 16" ACP waterline. The interconnect will minimize impacts to CIWS Zone 1 if there were instances where PVOU project water was not available or the Lomitas pump station was not operational so that sufficient water could be pumped to the Industry Hills reservoir while also supplying PVOU and maximum day demands. Pump Station No. 2 pumps water to the two (2) 2.5-million-gallon Industry Hills Reservoirs. Pump Station No. 3 pumps water from LPVCWD's Zone 2 service area to the Industry Hills Reservoir.

The average day demand in CIWS system is 1.20 MGD with a maximum daily demand of 2.89 MGD. While most demand occurs in the Zone 1 area, a percentage of the flow is demanded in the Industry Hills Zone. Approximately 0.18 MGD, on average, is utilized in this Industry Hills Zone and 0.43 MGD is required under maximum day conditions. However, the Industry Hills reservoirs also supply gravity storage through system interconnectivity to LPVCWD's Zone 3, Sub-Zone 3, Zone 5 and emergency water supply to LPVCWD's Zone 2. The near term maximum day demand when considering Zones 3 and 5 and Industry Hills is approximately 350 gpm. Since the connections to LPVCWD's Zone 2 are for emergency water supply only and not continuous supply, LPVCWD's Zone 2 demand is not included in the MDD assumption. As a result, Industry Hills Pump Station should have the ability to supply the maximum day flow of both Industry Hills pump station Nos. 1 and 2 and have a redundant 350 gpm capacity when the largest source is considered to be out of service. Note that the gas engine pumps are rarely if ever utilized and are not considered a reliable pumping source. As a result, these pumps are not considered in this analysis.

In order to satisfy the design criteria for production into each zone, each pump station must be able to supply the MDD when the largest source is out of service. The MDD for the Industry Hills Zone, along with LPVCWD Zone 3, Sub-Zone 3 and Zone 5, is approximately 350 gpm. As a result, considering existing and near term demands, the pump stations have sufficient capacity to convey the flow. However, when considering the additional 1,750 gpm of PVOU project water and conveyance through the system, an additional pump is necessary to satisfy these conditions. A total maximum demand of 2,100 gpm will pass through both the Industry Hills Pump Station Nos. 1 & 2. Each pump station has a redundant capacity of 1,100 gpm. As a result, there is a 1,000 gpm deficit in the redundant capacity of each station. A pump having a capacity of 1,100 gpm will be selected to match the existing pump capacities and which will have sufficient head (175 feet) to convey the flow. In light of this, a 75 horsepower motor will be selected to accommodate the additional load at Industry Hills pump stations Nos. 1 and 2.

Furthermore, the Industry Hills Booster pump station Nos. 1 and 2 must operate simultaneously to match the flow of the alternate pump station in order to maintain constant flow from Zone 1 to the Industry Hills reservoirs. There is no intermediate storage in between these zones to offset pump station operation. In addition, the PVOU system, which supplies water from the treatment plant, must also interface with the Industry Hills pump stations. Flow delivered from the PVOU will be matched by these pump stations as much as is practical while supplemental water may be provided to Industry Hills Pump Station No. 1 from the new interconnect (interconnect 2), which will supply water from LPVCWD Main Street Reservoirs.

Alternative B

Currently, there are two booster pump stations at the Main Street Reservoir site. The pump station located at the west side is comprised of two pumps that services Pressure Zone 4. The other pump station is comprised of three booster pumps that services Pressure Zone 2. The current pump stations at the Main Street Reservoir are described in **Table 3**.

Table 3 – Current Pump Stations Information at Main Street Reservoir

Station No.	**West (Zone 4)**			**East (Zone 2)**		
Pump No.	GPM	TDH	HP	GPM	TDH	HP
1	111	180	15	700	231	75
2	111	180	15	1,556	277	150
3				890	208	75

The Zone 4 booster station has been sized to convey the Peak Hour Demand to Zone 4 service area. This booster station takes suction from the Main Street Reservoirs and pumps directly into the system without the benefit of gravity storage. The fire flow in this zone is also supported by the operation of the largest pump in the Zone 2 pump station array.

The Zone 2 booster station has also been sized to convey the Peak Hour Demand in Zone 2 while also supplying sufficient water to support operation of the Zone 3 pump station. Zone 2 also does not have the benefit of pumping to gravity storage.

Considering the foregoing neither one of these pump stations have sufficient redundant capacity to support the conveyance of PVOU project water toward RWD. In light of this, a new booster station, having sufficient capacity, should be provided to convey the PVOU project water to RWD. Pumps of total 1,750 gpm capacity should be installed to take suction from the Main Street Reservoirs for this purpose.

Headloss

The friction headloss throughout the transmission pipeline systems can be calculated using the pipe diameter, pipe length and roughness factor. Using the Hazen-Williams equation, the approximate friction headloss through a pipe, due to friction, can be calculated.

Along with the linear losses, the minor losses are also considered. Minor losses include headloss due to bends, valves, or tees. The resulting headlosses for a flow of 1,750 gpm are shown in

Table 4.

Table 4 – Pipe Headloss at 1750 gpm

DESCRIPTION			LOSSES													
			LINEAR (hf_L)					FITTING (hf_F)				EQUIPMT (hf_E)		OTHER	TOTAL
Item No.	Item	Qty	Flow	"d"	"L"	"C"	Loss	"K"	Vel	$V^2/2g$	Loss	"M"	Loss	Loss	Loss
			gpm	in	ft		ft		fps	ft	ft		ft	ft	ft
1)	**Linear Losses**														
	14" dia piping	1	1750	14.0	7000	130	23.78								23.78
														Sub-Total Linear Losses	**23.8**
2)	**Fitting Losses**														
	90^o bend	5	1750	14.0				0.3	6.0	0.6	0.17				0.84
	Pump Control Valve	1	875	10.0				4.8	6.0	0.6	2.68				2.68
	Tee	10	1750	14.0				0.26	6.0	0.6	0.15				1.45
	Flow Meter	1	1750	10.0				5	6.0	0.6	2.80				2.80
	Cross	2	1750	14.0				0.26	6.0	0.6	0.15				0.29
														Sub-Total Fitting Losses	**8.1**
														Total Losses	**31.8**
														25% Misc Losses	**2.0**
														Total Proposed and Future Losses	**33.9**

Total Dynamic Head

Considering the pressure head, velocity head, elevation head, and headlosses between the two points, the Bernoulli equation can be utilized to solve for the total dynamic head (TDH), or also called h_p. The elevation of the new pump station is approximately 451 feet above mean sea level (AMSL), the low water level of the Main Street Reservoir is approximately 468 AMSL, suction losses were assumed to be 5 psi, the elevation and pressure of RWD 8" interconnection is approximately 390.4 feet AMSL and 110 psi respectively. Pressure at the RWD connection was determined by input from RWD. The TDH required is approximately 230 feet.

Motor Size

With the TDH determined, the motor can be sized. For a maximum design flow rate of 1,750 gpm, a TDH of 230 ft and an assumed motor efficiency of 80%, the required motor horsepower of a variable speed pump having 900 gpm maximum capacity, would require 65 brake horsepower. Based on this analysis, two booster pumps will be utilized in this pump station, each having a horsepower rating of 75 HP. Note, this does not provide system reliability. As a result, if a single pump were to be out of service, the full 1,750 gpm of flow could not be supplied to RWD.

Storage Analysis

In the LPVCWD and CIWS systems, there are three reservoir sites - Industry Hills, Lomitas and Main Street. Information about these reservoirs is described in **Table 5**.

Table 5 – Current Reservoir Information

Reservoir	Base Elevation	Overflow Elevation	Diameter	Height	Volume	Installed	Material
IH 1	700	34	110	36	2.5 MG	1978	Steel
IH 2	700	34	110	36	2.5 MG	1978	Steel
LM	392	32	115	38	2.5 MG	1986	Steel
MS 1	450	38	115	40	3.0 MG	1973	Steel
MS2	450	38	90	40	1.8 MG	2005	Steel

IH: Industry Hills, LM: Lomitas, MS: Main Street

The current total capacity of the Industry Hills, Lomitas and the Main Street reservoirs are 5.0 MG, 2.5 MG and 4.8 MG, respectively. The design criteria for reservoir sizing requires that storage be provided to contain fire flow reserves, one day of MDD for emergency reserves and

30% of one day of MDD for operations. Both 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. As a result, the storage capacity of both systems is considered collectively in this analysis and is equal to 12.3 MG. Considering the water demand for LPVCWD and applying the design criteria, the storage requirement is approximately 5.6 MG for near term conditions. For CIWS, the storage requirement for near term conditions is approximately 4.9 MG, thus equaling a total storage requirement of 10.5 MG. When considering near term conditions without PVOU project water, there is a storage surplus.

For the near term condition (i.e. the next five years), the water demand for LPVCWD and CIWS will increase by approximately 5% from current demands, as shown in **Table 6** and **Table 7**.

However, to accommodate the additional flow of 1,750 gpm from PVOU, a 1.5MG reservoir would need to be constructed for both alternatives to ensure that an uninterruptible storage is available. The total required storage is 13.8 MG to supply emergency and operational storage for the PVOU project in the near term condition. This results in a 1.5 MG deficit to the storage capacity of the existing reservoir system.

Table 6 – Current Storage Requirement

LP	GPM	Emergency (Gal)	Operational (Gal)	CIWS	GPM	Emergency (Gal)	Operational (Gal)
MDD	2,373	3,416,813	1,025,043	MDD	2,006	2,888,285	866,485
Fire Flow	4,000	960,000	-	Fire Flow	4,000	960,000	-
PVOU	1,750	2,520,000	756,000	-	-	-	-
						Total	13,392,627

Table 7 – Near Term Storage Requirement

LP	GPM	Emergency (Gal)	Operational (Gal)	CIWS	GPM	Emergency (Gal)	Operational (Gal)
MDD	2,494	3,591,104	1,077,331	MDD	2,108	3,035,617	910,685
Fire Flow	4,000	960,000	-	Fire Flow	4,000	960,000	-
PVOU	1,750	2,520,000	756,000	-	-	-	-
						Total	13,810,737

When considering the nature of delivery of PVOU project water through the respective systems, the provision for providing uninterruptible supply to RWD may not be necessary. Provided that project stakeholders are agreeable to interruptible storage and supply when PVOU project water

is unavailable or if there were an event in either the LPVCWD or CIWS systems that depleted storage, the requirement of providing one day of emergency storage of PVOU project water may be eliminated. In light of this, the total storage requirement when considering only operational storage of 30% PVOU water is 11.3 MG. As a result, there is adequate storage capacity in both LPVCWD and CIWS systems to support the PVOU operation and additional reservoir capacity is not needed. Further cost analysis assumes that this is the case.

Chloramination Facility Analysis

For Alternative A and B, a new chloramination facility must be constructed. The new chloramination facility will consist of the following:

- A 1,000-gallon sodium hypochlorite (12.5%) storage vessel
- A 300-gallon aqueous ammonia (19%) storage vessel
- A 150-gallon scrubber tank
- One flow control valve
- Four chemical metering pumps (2 for sodium hypochlorite and 2 for aqueous ammonia)
- One static mixer
- Two chlorine residual analyzers (1 for influent water and 1 for effluent water)
- One Ammonia analyzer, SCADA system, Chemical Storage Shelter

In Alternative A, the chloramination facility would be constructed within the existing CIWS Industry Hills Pump Station No. 3 site which is located approximately 30' north of the Industry Hills Parkway and is accessible by the use of a driveway shared with the Pacific Palms Golf Resort. This location may pose difficulty in receiving regular deliveries of sodium hypochlorite and aqueous ammonia.

In Alternative B, the chloramination facility will be located on LPVCWD property with proper access to Main Street, which should not pose any significant issue with regular chemical deliveries.

Cost Analysis

For the purpose of delivering the water (1,750 gpm) from PVOU to RWD, there are several facility improvements needed to be performed such as interconnections, pumps, a chloramination facility and pipeline installations.

Alternative A

For Alternative A, the cost estimate includes costs associated with the interconnections that will be either constructed or upgraded, the installation of two new vertical turbine pumps and associated electrical equipment, the new configuration of distribution piping, and the construction of the new chloramination facility. The Construction and O&M cost for Alternative A are shown in **Table 8** and **Table 9**.

Table 8 – Construction Cost of Alternative A

Item#	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Demobilization and Bonding	1	LS	$17,070	$17,070
2	Provide excavation safety measures	1	LS	$3,500	$3,500
3	Construct 12" Interconnection (Interconnection 1)	1	LS	$50,000	$50,000
4	Construct 16" Interconnection (Interconnection 2)	1	LS	$50,000	$50,000
5	Upgrade Interconnection between LPW 16" and RWD 8" water line (Interconnection 3)	1	LS	$75,000	$75,000
6	Construct Pressure Sustaining Valve to LPW Zone 2	1	LS	$100,000	$100,000
7	Furnish and Install Pump equipment at IHPS #1 and #2 including Motor, electrical, discharge head and fittings, gaskets, etc.	150	HP	$1,500	$225,000
8	New Chloramination Facility	1	LS	$350,000	$350,000
9	Pressure Test and Disinfect	1	LS	$10,000	$10,000
Sub Total					**$880,570**
15% Construction Contingency					**$132,086**
20% Engineering/Admin/Planning					**$176,114**
Grand Total					**$1,188,770**

Table 9 – Annual Operation and Maintenance Cost of Alternative A

Item#	Description	Quantity	Unit	Unit Cost	Total Cost/Year
1	Booster station replacement	1.5%	%Capital Cost/Annum		$3,375
2	Booster Production Energy	1467300	Kwh/Annum	$0.11	$161,403
3	Pipeline Replacement Cost	0.15%	%Capital Cost/Annum		$413
4	Chloramination Replacement Cost	2.5%	%Capital Cost/Annum		$8,750
5	Chemical Cost	19308	Gallons/Annum	$1.33	$25,679
6	System O&M	3.5	Man Days/Month	$7,200.00	$25,200
Total Annual Cost					**$224,820**

Alternative B

For Alternative B, the cost estimate includes costs associated with the interconnections that will be either constructed or upgraded, the construction of the new pump station that includes the two pumps, and the construction of a chloramination facility at the Main Street Reservoir Site. About 7,000 linear feet of pipeline will also be required from new pump station to the RWD connection. Construction and O&M cost for Alternative B are shown in **Table 10** and **Table 11**.

Table 10 – Construction Cost of Alternative B

Item#	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Demobilization and Bonding	1	LS	$43,270	$43,270
2	Provide excavation safety measures	1	LS	$3,500	$3,500
3	Construct 12" Interconnection (Interconnection 1)	1	LS	$50,000	$50,000
4	Upgrade Interconnection between LPW 16" and RWD 8" water line (Interconnection 3)	1	LS	$75,000	$75,000
6	Construct 12" pipeline after new pump station to RWD interconnect	7000	LF	$175	$1,225,000
7	Construct Pump Station including Motor, electrical, discharge head and fittings, gaskets, etc.	150	HP	$3,000	$450,000
11	New Chloramination Facility	1	LS	$350,000	$350,000
12	Pressure Test and Disinfect	1	LS	$10,000	$10,000
Sub Total					**$2,206,770**
15% Construction Contingency					**$331,016**
20% Engineering/Admin/Planning					**$441,354**
Grand Total					**$2,979,140**

Table 11 – Annual Operation and Maintenance Cost of Alternative B

Item#	Description	Quantity	Unit	Unit Cost	Total Cost/Year
1	Booster station replacement	1.5%	%Capital Cost/Annum		$6,750
2	Booster Production Energy	1589575	Kwh/Annum	$0.11	$174,853
3	Pipeline Replacement Cost	0.15%	%Capital Cost/Annum		$2,025
4	Chloramination Replacement Cost	2.5%	%Capital Cost/Annum		$8,750
5	Chemical Cost	19308	Gallons/Annum	$1.33	$25,679
6	System O&M	3.5	Man Days/Month	$7,200.00	$25,200
Total Annual Cost					**$243,257**

The total construction cost for Alternative A and Alternative B is $1.2 M and $3.0 M, respectively. The main difference between each total cost is the construction of the new pump station needed for Alternative B.

Conclusion

The purpose of this project was to analyze the storage and pump station capacity for delivering potential maximum water demand to RWD (1,750 gpm) from the PVOU IZ treatment facility.

The current pumps at both water systems are adequate to deliver the MDD and Fire flow for existing condition; however, an additional booster pump needs be constructed to deliver 1,750 gpm to RWD. For Alternative B, a new booster station needs be constructed with two different booster pumps each having 75 hp capacity. For Alternative A, new 75 hp booster pump will be installed at Industry Hills pump station 1 and 2.

The current storage capacity for LPVCWD and CIWS is sufficient to provide operational storage for the PVOU project water.

The cost for two alternatives are as follow:

Alternative	Construction Cost	Annual O&M Cost
A	$1,188,770	$224,820
B	$2,979,140	$243,257

Based on the cost analysis of construction and annual operation and maintenance for both alternatives, Alternative A is a more economical option.

Considering the integrity of the 16" waterline in Alternative A; when subject to higher pressures, it is recommended that pressure testing of this pipeline under pressures comparable to future conditions be performed prior to moving forward with implementation of Alternative A. If testing concludes that the 16" waterline cannot hold water satisfactorily at the higher pressures, the addition of a dedicated parallel pipe from Industry Hills Booster Station No. 3 to the RWD connection would be warranted for full implementation of Alternative A. In this scenario, the cost benefit of Alternative A over B would diminish.

Also chemical addition to chloraminate water compatible with the RWD system adds an additional level of complexity to both Alternative A and B. Alternative A installs the disinfection system at the existing Industry Hills Pump Station No. 3 site. Access to the site is constrained and delivery of chemicals will need to be planned so as to allow for satisfactory operation of chemical delivery equipment and coordination with the Pacific Palms resort. In addition, Alternative A completely changes the current use of the transmission main from Industry Hills Pump Station No. 3 to RWD point of connection. Previously this pipeline provided the capability to deliver chemically compatible water to and from LPVCWD and CIWS. What's more, in Alternative A solution only chloraminated water can be delivered from CIWS through the transmission main to RWD. Supply

of LPVCWD water to CIWS through pumping of the Industry Hills Pump Station No. 3 is abandoned and this emergency supply to CIWS is eliminated. Also this configuration minimizes the use of supply of CIWS water to LPVCWD as water in this pipeline will now be chloraminated and use in the LPVCWD will require additional monitoring and/or the stopping of delivery of chloraminated water to RWD in favor of emergency supply to LPVCWD as a free chlorine system.

In Alternative B, chloramination can be performed without materially impacting the LPVCWD system because the proposed transmission main is completely dedicated to RWD supply. The site also exhibits greater access capabilities for delivery of chemical. When making the ultimate decision for implementation, the foregoing observations should be considered.

If you have any further questions or comments, please feel free to call me at (626) 357-0588 or email me at shawes@civiltec.com.

Very truly yours,
CIVILTEC engineering, inc.

C. Shem Hawes, P.E.
Senior Engineer, Principal

CSH:dlo
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Upcoming Events

To: Honorable Board of Directors

From: Rosa Ruehlman, Office Administrator *RBR*

Date: 06/12/17

Re: Upcoming Board Approved Events for 2017

Day/Date	Event	***Aguirre***	***Escalera***	***Hastings***	***Hernandez***	***Rojas***
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 at 11:30 am at South Hills Country Club					
Thursday, August 24, 2017	NO SCWUA - Dark					
Monday-Thursday, September 25-28, 2017	CSDA 2017 Annual Conference in Monterey Marriott/Portola Hotels in Monterey, CA **Deadline August 25, 2017 for Earlybird**					
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 **Deadline September 22, 2017**					
Thursday, October 26, 2017*	SCWUA Luncheon at the Pomona Fairplex					
Wednesday, November 8, 2017*	San Gabriel Valley Water Association Luncheon at 11:30 am at South Hills Country Club					

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*	SCWUA Luncheon at the Pomona Fairplex (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)

Upcoming Meeting:

- 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**	**05/09/19**	**10/10/18**	**05/09/19**
Form 700 **Annual Requirement**	**04/01/18**	**04/01/18**	**04/01/18**	**04/01/18**	**04/01/18**
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.

City of La Puente 2017 Events

	Date	Event	Sponsored by
1	1st Tuesday each month	Planning Commission Meeting	LP
2	2nd & 4th Tuesday each month	City Council Meetings	LP
6	July - August 2017 (Mondays)	Movies in the Park	LP
7	July - August 2017 (Wednesday)	Concerts in the Park	LP
8	07/03/2017 (Monday)	4th of July Celebration	LP
9	08/01/2017 (Tuesday)	National Night Out	L.A Co. Sheriffs
10	August 19, 2017 (Tenative Date)	Jr. All American Football	LP
11	10/29/2017 (Sunday)	Main St. Run	LP
12	11/11/2017 (Saturday)	Veteran's Day	LP
13	12/01/2017 (Friday)	Holiday Parade and Tree Lighting Ceremony	LP & Old Towne Puente

The San Gabriel Valley Tribune (http://www.sgvtribune.com)

Contaminated ground water in San Gabriel Valley gets $250 million boost, extending cleanup until 2027

Five companies agree to pay at least $200 million for work at treatment plants

By Steve Scauzillo, San Gabriel Valley Tribune

Sunday, June 4, 2017

Five companies responsible for polluting the groundwater in the San Gabriel Valley have agreed to continue cleanup for another 10 years, sparing 400,000 residents higher water bills, a state agency announced Thursday.

A new, 10-year agreement signed in mid-May will continue the operation of five treatment plants within the Baldwin Park-Azusa site, one of six zones containing underground plumes of water contaminated with carcinogens that make up a portion of the largest Superfund site in the United States.

The new agreement will provide between $200 million and $250 million toward operations, maintenance and capital improvements, said Kenneth Manning, executive director of the San Gabriel Basin Water Quality Authority, the agency overseeing cleanup that negotiated the deal.

“With the renewed agreement, the customers are absolved from having to pay those treatment costs,” said Dan Arrighi, water resources manager with San Gabriel Valley Water Co., one of seven water entities that will receive funding from polluters and use the restored water to serve customers.

The water company avoided possible water rate hikes of 50 percent affecting 257,000 people in their service area, he estimated.

The five companies are: Aerojet Rocketdyne, Inc.; Chemical Waste Management; Allied Waste Industries, Inc. (for Azusa Land Reclamation, Inc., a closed landfill on the Azusa-Irwindale border); Winco Enterprises, Inc (in care of Parker Hannifin Corp.); and Hartwell Corp.

With the agreement, treatment continues through 2027. Ground water flowing hundreds of feet beneath La Puente, Baldwin Park, Azusa, Covina, parts of West Covina and Hacienda Heights will be drawn from polluted sections, treated and delivered to customers.

The five plants within the boundaries of the Baldwin Park Operable Unit can treat 30,000 gallons of water per minute. They’ve been operating under a previous, 15-year agreement since 2002, Manning said. Before that water companies built smaller, well-head treatment plants. All together, the projects have treated 213.2 billion gallons of water and removed 91,000 pounds of contaminants, according to the WQA.

“That water is treated to better than drinking water standards and then served to the public using state-of-the-art technology,” Manning added. “It is probably the best water in the country.”

The continued treatment serves a dual purpose.

Foremost, the U.S. Environmental Protection Agency requires parties responsible to pay for cleanup under the Superfund Law, so that the residents are not burdened with the added costs.

Second, Superfund Law requires polluters to clean up toxic spills, in this case to cleanse the aquifer of toxic contaminants, including: trichloroethylene, a degreasing agent that can damage the liver, kidneys and central nervous system and can cause cancer after extended exposure in drinking water; and perchlorate, a component of rocket fuel and a "likely human carcinogen" that interferes with the human endocrine system. These are some of the chemicals used in bomb-making plants in the 1950s and 1960s operating during the Cold War that have seeped into the basin, a source of drinking water for 1.8 million people.

Contamination of vast sections of the groundwater basin from Alhambra to City of Industry was first detected in 1979 and listed as a Superfund site in 1984. Before any treatment began, peak contaminant concentrations in the Baldwin Park area for PCE reached 38,000 micrograms per liter, more than 7,500 times the maximum contaminant level (MCL) allowed by state and federal laws, according to EPA documents.

Today, water is treated to well below the MCLs for each contaminant, resulting in a negligible cancer risk, Manning said. Also, water retailers are continually checking pipes for corrosion and testing water for lead before it is delivered to household connections, he said.

A majority of the cleanup is focused on perchlorate and N-nitrosodimethylamine (NDMA), used in liquid-fuel rockets. Of the responsible parties, only Aerojet made bombs and rockets at its plant in Azusa.

Aerojet is responsible for about two-thirds of the cleanup funding, Manning said.

"Here in the San Gabriel Valley, Aerojet would burn those rockets, test them, then take a hose to the cannisters and wash it all out on the ground. The residue went into the groundwater," Manning said.

Besides Baldwin Park-Azusa, the five other zones are: El Monte, South El Monte, Whittier Narrows, Area 3 (Alhambra) and Puente Valley. Inside the latter zone, a new plant is being built by Northrop Grumman in the City of Industry, which may be operational in 2018.

Manning said treatment of the entire basin will go on for another 50 to 60 years. "Until it is done," he said.

RESOLUTION NO. 6-17-581

A RESOLUTION OF THE BOARD OF DIRECTORS OF UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT REPEALING RESOLUTION NO. 5-16-566 AND ADOPTING WATER RATES AND CHARGES FOR CALENDAR YEAR 2018

WHEREAS, the Metropolitan Water District of Southern California ("MWD" herein) has adopted water rates and charges for its classes and conditions of service effective January 1, 2018 and the Upper San Gabriel Valley Municipal Water District ("Upper District" herein) wishes to reflect MWD's new rates and charges in the water rates and charges of the Upper District; and

WHEREAS, MWD has established charges in their rate structure including a Readiness-to-Serve Charge, Capacity Charge, Tier 1 and 2 Commodity Charges; and

WHEREAS, Upper District requested that MWD continue its standby charge in Upper District's service area with the intention that the above referenced Readiness-to-Serve Charge be paid from the funds generated from said standby charge for Calendar Year 2018; and

BE IT RESOLVED BY THE BOARD OF DIRECTORS OF UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT as follows:

Section 1. Resolution No. 5-16-566, adopted on May 17, 2016, is hereby repealed.

Section 2. The following water rates are established and will remain effective for Calendar Year 2018:

Normal Supply Rates

	Rate per Acre Foot
Class of Service	
Full Service – Treated (Tier 1)	$1,118
Full Service – Treated (Tier 2)	$1,204
Groundwater Replenishment Service	Not Available
Full Service – Untreated (Tier 1)	$798
Full Service – Untreated (Tier 2)	$884
Recycled Water Service	By Contract
Capacity Charge	$8,700 per CFS
Minimum Service Connection Charge (per year)	$870
Groundwater Replenishment Ready-to-Serve	$42 per CFS/$6,300 per month

Section 3. Description of Service Classes:

Full Service Treated (Tier 1)

For Calendar Year 2018, the Upper District may purchase up to 67,228 acre feet per year, which will be sold at the Tier 1 rate of $1,118 per acre foot (subject to alternative pricing imposed under MWD's Water Supply Allocation during droughts).

Full Service Treated (Tier 2)

For Calendar Year 2018, the Upper District will have an unlimited amount (subject to MWD's Water Supply Allocation Plan) of Full Service Tier 2 supply. Once the Tier 1 Limit is utilized, all treated water sold will be subject to the Tier 2 rate of $1,204 per acre foot effective January 1, 2018.

Annual Capacity Charges

The Full Service Tier 1 rate per acre foot as well as the Full Service Tier 2 rate per acre foot assumes a reasonable and normal annual maximum daily average capacity usage per acre foot of water deliveries. Upper District will pass through MWD's capacity charge on use of the imported water distribution system during the May through September time period, as determined by MWD. For Calendar Year 2018, MWD's capacity charge will be calculated as $8,700 for each CFS of peak capacity utilized during the period of May through September period for the three calendar years ending 2016.

Full Service Untreated (Tier 1)

The Upper District's Tier 1 Limit includes both treated and untreated Tier 1 deliveries. Full Service untreated deliveries will be billed at the Tier 1 rate of $798 per acre foot effective January 1, 2018 only if there is sufficient Tier 1 Limit remaining after all Full Service treated deliveries have been accounted for (subject to alternative pricing imposed under MWD's Water Supply Allocation during droughts). In the event that the Upper District Tier 1 Limit is exceeded, all Full Service untreated deliveries will be subject to Tier 2 rate.

Full Service Untreated (Tier 2)

For Calendar Year 2018, the Upper District will have an unlimited allocation (subject to MWD's Water Supply Allocation Plan), of Full Service Tier 2 supply. Once the total allocation of Tier 1 supply is utilized, all untreated water sold will be subject to the Tier 2 rate of $884 per acre foot effective January 1, 2018.

Section 4. Each groundwater replenishment customer shall pay a monthly ready-to-serve charge in addition to the water rate for groundwater replenishment service. This monthly ready-to-serve charge will be $42 for each cubic foot per second of groundwater replenishment service connection capacity, at an amount not-to-exceed $6,300 per month, payable in advance.

Section 5. A minimum charge equivalent to ten percent (10%) or one-tenth (1/10) of the value of one CFS of capacity ($8,700), which equals $870 per year effective January 1, 2018, will be billed to the sub-agencies prorated on a monthly basis irrespective of the amount of water used.

Section 6. All sales, deliveries and availability of water at the rates established herein shall be subject to the ability of the Upper District to sell, deliver and make available such water under operating conditions determined by the General Manager of Upper District and of MWD, and subject to the water service regulations of Upper District and of MWD. All agencies that purchase treated or untreated water must comply with all rules, requirements, and regulations of Upper District's Urban Water Management Plan adopted on or about June 2016 and any amendments or supplements thereto.

Section 7. The Board of Directors finds the rates, fees, and charges set forth herein are for the purpose of meeting operating expenses, including employee wages and benefits; purchasing or leasing of supplies, equipment or materials; meeting financial reserve needs and requirements; obtaining funds for capital projects necessary to maintain service within existing service areas, and obtaining funds to meet long-term debt costs. None of the rates, fees, and charges described above exceed the reasonable cost of providing the service for which the rate, fee, or charge is levied.

Section 8. The Board of Directors recognizes that Southern California is facing water supply challenges arising from both reoccurring droughts and environmental factors. These factors have created uncertainty regarding the reliability of all sources of water for the foreseeable future. As such, the Board reserves the authority to modify, alter, or suspend any or all sections of this resolution as determined prudent to properly respond to new developments in water supply circumstances.

Section 9. The Secretary of Upper District shall cause a copy of this Resolution to be mailed to all current purchasers of water from Upper District including the users of water replenishment service connections.

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PASSED, APPROVED, AND ADOPTED this 6th day of June, 2017.

AYES:	CHAVEZ, TREVIÑO, URIAS
NOES:	CONTRERAS
ABSTAIN:	NONE
ABSENT:	FELLOW

Ed Chavez, President

ATTEST:

Charles M. Treviño, Treasurer

(SEAL)

APPROVED AS TO FORM:

Steven P. O'Neill, District Counsel