2015

Santa Clara Valley
Water District

Urban Water Management Plan

Appendices Only

Santa Clara Valley Water District

2015 Urban Water Management Plan

Prepared by:

Tracy Hemmeter
Senior Project Manager

Michael Martin
Environmental Planner II

Eric Olson
Engineering Systems Analyst

Cris Tulloch
Associate Water Resources Specialist

Justin Burks
Water Conservation Specialist II

Under the Direction of:

James Fiedler
Chief Operating Officer,
Water Utility Enterprise

Garth Hall
Deputy Operating Officer,
Water Supply Divison

Gerald De La Piedra
Unit Manager,
Water Supply Planning and Conservation

Santa Clara Valley
Water District

BOARD OF DIRECTORS

And the following contributors:

Benjamin Apolo III
Cindy Kao
Debra Caldon
Debra Osikominu
Erin Baker
James O'Brien
Katrina Jessop
Luis Jaimes
Melih Ozbilgin
Miguel Silva
Vanessa De La Piedra
Xiaoyong Zhan

May 2016

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Appendices

DWR Standardized Tables for Wholesalers

Appendix A

Table 2-2: Plan Identification

Select Only One	Type of Plan	Name of RUWMP or Regional Alliance *if applicable* *drop down list*
☑	**Individual UWMP**	
	☐ Water Supplier is also a member of a RUWMP	
	☐ Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**	

NOTES:

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☑	Agency is a wholesaler
☐	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF
NOTES:	

Table 2-4 Wholesale: Water Supplier Information Exchange (select one)	
☑	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with CWC 10631. Completion of the table below is optional. If not completed include a list of the water suppliers that were informed.
2-1	**Provide page number for location of the list.**
☐	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631. **Complete the table below.**
Water Supplier Name *(Add additional rows as needed)*	
NOTES: See Chapter 2 and Appendix B	

Table 3-1 Wholesale: Population - Current and Projected

Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	1,887,770	1,977,900	2,080,600	2,188,500	2,303,500	2,423,500

NOTES: See Table 3-2

Table 4-1 Wholesale: Demands for Potable and Raw Water - Actual

Use Type *(Add additional rows as needed)*	2015 Actual		
Drop down list *May select each use multiple times These are the only use types that will be recognized by the WUE data online submittal tool*	Additional Description *(as needed)*	Level of Treatment When Delivered *Drop down list*	Volume
Sales to other agencies	Ground water production and Treated Water	Drinking Water	170,700
Agricultural irrigation		Drinking Water	26,700
Other	Independent GW Pumping	Drinking Water	16,900
Other	Raw Water	Raw Water	1,500
Losses		Drinking Water	2,400
		TOTAL	218,200

NOTES: Sales to agencies, agricultural irrigation, independent groundwater pumping, and raw water taken from 2016-2017 Report on the Protection and Augmentation of Water Supplies, Table 1-3.1, 1-3.2
Losses from Water Loss Audit (Appendix E)

Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected

Use Type *(Add additional rows as needed)*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
Drop down list *May select each use multiple times* *These are the only Use Types that will be recognized by the WUEdata online submittal tool.*		2020	2025	2030	2035	2040 *(opt)*
Sales to other agencies	Groundwater and Treated Water	232,800	246,300	260,000	275,400	283,800
Agricultural irrigation	Groundwater	26,000	26,000	26,000	26,000	26,000
Other	Independent GW	17,600	17,600	17,600	17,600	17,600
Other	Raw Water	1,700	1,700	1,700	1,700	1,700
Losses		2,900	3,000	3,100	3,200	3,200
	TOTAL	281,000	294,600	308,400	323,900	332,300

Notes: Table 4-1 in the UWMP reports total water demand in Santa Clara County which is partially served by the SFPUC, recycled water and surface water rights held by San Jose Water Company and Stanford University. Numbers reported above reflect SCVWD controlled supplies only.

Table 4-3 Wholesale: Total Water Demands

	2015	2020	2025	2030	2035	2040*(opt)*
Potable and Raw Water *From Tables 4-1 and 4-2*	218,200	281,000	294,600	308,400	323,900	332,300
Recycled Water Demand* *From Table 6-4*	0	0	0	0	0	0
TOTAL WATER DEMAND	218,200	281,000	294,600	308,400	323,900	332,300

***Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES: SCVWD supplies only

Table 4-4 Wholesale: 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
07/2013	2,445

** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*

NOTES: See Appendix E

Table 6-1 Wholesale: Groundwater Volume Pumped

☑ Supplier does not pump groundwater.
The supplier will not complete the table below.

Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2011	2012	2013	2014	2015
	TOTAL	0	0	0	0	0

NOTES: SCVWD has well fields for emergency use, which have not been utilized in the reporting period.

Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2015										
☑	Wholesale supplier neither distributes nor provides supplemental treatment to recycled water. The supplier will not complete the table below.									
							2015 volumes			
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level *Drop down list*	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Add additional rows as needed										
						Total	0	0	0	0

NOTES: The District provides supplemental treatment to recycled water, but, based on page M-17 of the DWR's UWMP Guidebook Appendices, is not required to complete this table since it does not distribute that water.

Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area

☑ Recycled water is not directly treated or distributed by the supplier. The supplier will not complete the table below.

Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035	2040 *(opt)*
Add additional rows as needed							
	Total	0	0	0	0	0	0

NOTES:

Table 6-5 Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual		
☑	Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2010 Projection for 2015	2015 actual use
Add additional rows as needed		
Total	0	0
NOTES:		

Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs

☐ No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.

☐ Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.

Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other agencies?		Description *(if needed)*	Planned Implementation Year	Planned for Use in Year Type *Drop Down list*	Expected Increase in Water Supply to Agency
	Drop Down Menu	*If Yes, Agency Name*				
Add additional rows as needed						
Dam Improvements / Seismic Retrofits	*No*			2022	All Year Types	13,800
Main and Madrone Pipelines Restoration	*No*			2019	All Year Types	600
Potable Reuse Program	*No*			2021	All Year Types	20,200

NOTES: The expansion of two recycled water programs are listed in Table 6-4 of the UWMP. The SCVWD is participating in these projects, but the recycled water supplied will be provided by retailers.

Table 6-8 Wholesale: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015		
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Actual Volume	Water Quality *Drop Down List*	Total Right or Safe Yield *(optional)*
Add additional rows as needed				
Purchased or Imported Water		115,000	Raw Water	
Surface water		38,000	Raw Water	
Other	Natural Groundwater Recharge	39,000	Raw Water	
	Total	192,000		0

NOTES: From 2016-2017 Report on the Protection and Augmentation of Water Supplies

Table 6-9 Wholesale: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	**Projected Water Supply** *Report To the Extent Practicable*									
		2020		**2025**		**2030**		**2035**		**2040** *(opt)*	
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Add additional rows as needed											
Purchased or Imported Water		171,000		175,300		175,300		175,300		175,300	
Surface water		67,900		75,000		79,100		81,800		82,800	
Groundwater	Natural Recharge	60,900		60,900		60,900		60,900		61,000	
Recycled Water	Potable Reuse	0		20,200		20,200		20,200		20,200	
	Total	299,800	0	331,400	0	335,500	0	338,200	0	339,300	0

NOTES: See Table 6-6. Figures in Table 6.6 for surface water include all utilized surface water in Santa Clara County which includes supplies from San Jose Water Company and Stanford Universtiy. Surface water figures reported above are SCVWD supplies.

Table 7-1 Wholesale: Basis of Water Year Data

Year Type	**Base Year** *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	1922-2015	299800	100%
Single-Dry Year	1977	290100	
Multiple-Dry Years 1st Year	2013	283000	
Multiple-Dry Years 2nd Year	2014	249700	
Multiple-Dry Years 3rd Year	2015	173000	

Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

NOTES: Tables 7-2, 7-3 and 7-4 in the UWMP report total County water supply for average year, dry year, and multi-dry years. Total County water supplies includes those not controlled by SCVWD such as local surface water from San Jose Water Company and Stanford, recycled water, and SFPUC supplies. Volumes reported above are SCVWD controlled supplies anticipated to be available in 2020. Supply availability will vary with the demand year.

Table 7-2 Wholesale: Normal Year Supply and Demand Comparison

	2020	2025	2030	2035	2040 *(Opt)*
Supply totals *(autofill from Table 6-9)*	299,800	331,400	335,500	338,200	339,300
Demand totals *(autofill fm Table 4-3)*	281,000	294,600	308,400	323,900	332,300
Difference	18,800	36,800	27,100	14,300	7,000

NOTES:

Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	290,100	303,800	317,400	333,000	315,600
Demand totals	290,100	303,800	317,400	333,000	341,500
Difference	0	0	0	0	(25,900)

NOTES: Table 7-3 in the UWMP reports total County water supply which also includes supplies not controlled by SCVWD such as local surface water from San Jose Water Company and Stanford, recycled water, and SFPUC supplies. Volumes reported above are SCVWD controlled demands and supplies only.

Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	282,600	296,200	309,900	325,400	333,800
	Demand totals	277,400	290,800	304,300	319,600	328,000
	Difference	5,200	5,400	5,600	5,800	5,800
Second year	Supply totals	249,200	301,100	285,800	269,700	260,400
	Demand totals	284,100	297,400	311,100	326,500	334,900
	Difference	(34,900)	3,700	(25,300)	(56,800)	(74,500)
Third year	Supply totals	172,500	239,700	212,100	179,700	160,600
	Demand totals	280,900	294,400	308,000	324,000	333,200
	Difference	(108,400)	(54,700)	(95,900)	(144,300)	(172,600)
Fourth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Fifth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

NOTES: For years 2013 - 2015. Table 7-4 in the UWMP reports total County water supply which also includes those not controlled by SCVWD. Volumes reported above are SCVWD demands and supplies only.

Table 8-1 Wholesale
Stages of Water Shortage Contingency Plan

Stage	Complete Both	
	Supply Reduction[1]	Water Supply Condition (*Narrative description)*
Add additional rows as needed		
1	0%	Groundwater storage > 300,000 af
2	0-10%	Groundwater storage 250,000 - 300,000 af
3	10-20%	Groundwater storage 200,000 - 250,000 af
4	20-40%	Groundwater storage 150,000 - 200,000 af
5	40-50%	Groundwater storage less than 150,000

[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*

NOTES: SCVWD's Water Shortage Contingency Plan is based on end of year groundwate storage. The values shown in the "Supply Reduction" column are the level of water use reductions that SCVWD would call for based on end of year groundwater storage.

Table 8-4 Wholesale: Minimum Supply Next Three Years

	2016	2017	2018
Available Water Supply	329,200	269,400	236,800

NOTES: Table 8-2 in the UWMP reports total County water supply which includes those not controlled by SCVWD such as local surface water from San Jose Water Company and Stanford, recycled water, and SFPUC supplies. Volumes reported above are SCVWD controlled supplies.

Table 10-1 Wholesale: Notification to Cities and Counties (select one)		
☑	Supplier has notified more than 10 cities or counties in accordance with CWC 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.**	
Appendix B	Provide the page or location of this list in the UWMP.	
☐	Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
	☐	☐
	☐	☐
	☐	☐
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
	☐	☐
	☐	☐
NOTES: See Appendix B		

Documentation of Compliance with Outreach Requirements

Appendix B

5750 Almaden Expressway, San Jose, CA 95118-3614 | (408) 265-2600 | www.valleywater.org

Santa Clara Valley Water District

February 3, 2016

IDENTICAL LETTER SENT TO ATTACHED LIST OF ADDRESSES

Subject: Notice of Urban Water Management Plan Update

Dear Sir or Madam:

The Urban Water Management Planning Act (California Water Code Sections 10610–10656) requires the Santa Clara Valley Water District (District) to update its Urban Water Management Plan (UWMP) every five years. The District's UWMP was last updated in 2011, and we are currently reviewing and considering changes to the plan.

The District will make proposed revisions to the UWMP available for public review and will hold a public hearing this spring to receive and consider comments on the proposed revisions. In the meantime, if you have any questions about the UWMP or the process for updating it, please contact Ms. Tracy Hemmeter at (408) 630-2647, or themmeter@valleywater.org.

Sincerely,

Garth Hall
Deputy Operating Officer
Water Supply Division

Attachment
cc: J. De La Piedra, C. Tulloch, T. Hemmeter, File
th:mf
0201a-l.docx

LIST OF ADDRESSES

Andree Johnson
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Nicole Sandkula
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Jim Simunovich
California Water Service Company
1720 North First Street
San Jose, CA 95122-4598

Paul Kermoyan
City of Campbell
70 North First Street
Campbell, CA 95008

Tom Capurso
City of Campbell
70 North First Street
Campbell, CA 95008

David Brandt
City of Cupertino
10300 North Wolfe Road
Cupertino, CA 95014-2232

Rick Smelser
City of Gilroy
7351 Rosanna Street
Gilroy, CA 95020

Susan Martin
City of Gilroy
7351 Rosanna Street
Gilroy, CA 95020

Steve Plasecki
City of Los Altos
One North San Antonio Road
Los Altos, CA 94022

Susanna Chan
City of Los Altos
One North San Antonio Road
Los Altos, CA 94022

Nina Hawk
City of Milpitas
455 East Calaveras Boulevard
Milpitas, CA 95034-5479

Steve Machida
City of Milpitas
455 East Calaveras Boulevard
Milpitas, CA 95034-5479

Brian Leventhal
City of Monte Sereno
18041 Saratoga-Los Gatos Boulevard
Monte Sereno, CA 95035

Andrew Crabtee
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037-4128

Dan Repp
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037-4128

Karl Bjarke
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037-4128

Alison Turner
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Elizabeth Flegel
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Gregg Hosfeldt
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Michael Fuller
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Randal Tsuda
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Jane Ratchye
City of Palo Alto
250 Hamilton Avenue
Palo Alto, CA 94301-2593

Karla Dailey
City of Palo Alto
250 Hamilton Avenue
Palo Alto, CA 94301-2593

Mike Sartor
City of Palo Alto
250 Hamilton Avenue
Palo Alto, CA 94301

Michael Liw
City of San Jose
200 East Santa Clara Street
San Jose, CA 95113-1905

Steve McHarris
City of San Jose
200 East Santa Clara Street
San Jose, CA 95113-1905

Chris De Groot
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050-3792

Mike Vasquez
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050-3792

Rajeev Batra
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050

Edwin Ordonez
City of Saratoga
13777 Fruitvale Avenue
Saratoga, CA 95070

John Cherbone
City of Saratoga
13777 Fruitvale Avenue
Saratoga, CA 95070

John Ramirez
City of Sunnyvale
P.O. Box 3707
Sunnyvale, CA 94088-3707

John Stufflebean
City of Sunnyvale
P.O. Box 3707
Sunnyvale, CA 94088-3707

Mansour Nasser
City of Sunnyvale
P.O. Box 3707
Sunnyvale, CA 94088-3707

Manuel Pineda
City of Sunnyvale
456 W. Olive Avenue
Sunnyvale, CA 94086

Trudy Ryan
City of Sunnyvale
456 West Olive Avenue
Sunnyvale, CA 94086

Kirk Girard
County of Santa Clara
70 West Hedding Street, 7th Floor
San Jose, CA 95110

Mike Harrison
County of Santa Clara
70 West Hedding Street, 7th Floor
San Jose, CA 95110

Tim Guster
Great Oaks Water Company
P.O. Box 23490
San Jose, CA 95153

Patrick Walter
Purissima Hills Water District
26375 West Fremont Road
Los Altos Hills, CA 94022

Michelle Novotny
San Francisco Public Utilities Commission
525 Golden Gate Avenue, 10th Floor
San Francisco, CA 94102

Paula Kehoe
San Francisco Public Utilities Commission
525 Golden Gate Avenue, 10th Floor
San Francisco, CA 94102

Jeff Provenzano
San Jose Municipal Water System
3025 Tuers Road
San Jose, CA 95121

Andy Gere
San Jose Water Company
374 West Santa Clara Street
San Jose, CA 95196

Bill Tuttle
San Jose Water Company
1221 South Bascom Avenue
San Jose, CA 95128-3514

Julia Nussbaum
Stanford University
327 Bonair Siding
Stanford, CA 94305-7270

Richard Chiu Jr.
Town of Los Altos Hills
26379 Fremont Road
Los Altos Hills, CA 94022

Matt Morley
Town of Los Gatos
110 East Main Street
Los Gatos, CA 95030

From: Tracy Hemmeter

To: "ajohnson@bawsca.org"; "jsimunovich@calwater.com"; "rsmelser@ci.gilroy.ca.us"; "nhawk@ci.milpitas.ca.gov"; "smachida@ci.milpitas.ca.gov"; "dan.repp@morganhill.ca.gov"; "Anthony.Eulo@morganhill.ca.gov"; "Elizabeth.Flegel@mountainview.gov"; "alison.turner@mountainview.gov"; "Iris.Lim@mountainview.gov"; "Karla.Dailey@CityofPaloAlto.org"; "cdegroot@santaclaraca.gov"; "mvasquez@santaclaraca.gov"; "jramirez@sunnyvale.ca.gov"; "mnasser@ci.sunnyvale.ca.us"; "tguster@greatoakswater.com"; "pwalter@purissimawater.org"; "Jeffrey.provenzano@sanjoseca.gov"; "bill.tuttle@sjwater.com"; "juliann@stanford.edu"; "takel@akeleng.com"; "amy.fowler@ch2m.com"; "flau@sfwater.org"; "gary@fiske-assoc.com"; "jake.walsh@sjwater.com"; "planninginfo@calwater.com"

Cc: Jerry De La Piedra; Eric Olson; Cris Tulloch; Justin Burks; Debra Osikominu

Subject: DRAFT UWMP Plan Tables and WSCP Chapter

Date: Monday, March 21, 2016 11:45:00 AM

Attachments: Reliability Analysis Write Up March.docx
2015 Urban Water Management Plan UWMP Modeling Assumptions.pdf
2015 Urban Water Management Plan WSCP Draft 3-16.docx
image001.png
DRAFT SCC 2015 UWMP Standardized Data Tables Final Draft.xlsx
Water Shortage Contingency Plan in tables.xlsx

Hi all,

I attached several draft Urban Water Management Plan documents for your review and use:

1. Draft SCVWD reliability analysis – Some of this information will be in different chapters in the actual UWMP
2. Our modeling assumptions
3. Draft Chapter 8 Water Shortage Contingency Planning
4. Draft Water Shortage Contingency Plan common retailer actions/stages that the workgroup developed with Kara Gross/JVSV.

For SFPUC customers, I would appreciate your input on whether I should the SFPUC use projections you provided as the available supply or whether I should use your ISG amounts.

Everyone, we plan to have the entire draft UWMP out for your review next week. It will be short turnaround time for your review, as we've targeting the end of April for posting the draft plan.

In the meantime, please let me know if you have questions or comments.

Thanks,
Tracy

Santa Clara Valley Water District

TRACY HEMMETER
SENIOR PROJECT MANAGER
Water Supply Planning and Conservation
Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118
(408) 630-2647
themmeter@valleywater.org

From: Tracy Hemmeter
To: ajohnson@bawsca.org; jsimunovich@calwater.com; rsmelser@ci.gilroy.ca.us; nhawk@ci.milpitas.ca.gov; smachida@ci.milpitas.ca.gov; dan.repp@morganhill.ca.gov; Anthony.Eulo@morganhill.ca.gov; Elizabeth.Flegel@mountainview.gov; alison.turner@mountainview.gov; Iris.Lim@mountainview.gov; Karla.Dailey@CityofPaloAlto.org; cdegroot@santaclaraca.gov; mvasquez@santaclaraca.gov; jramirez@sunnyvale.ca.gov; mnasser@ci.sunnyvale.ca.us; tguster@greatoakswater.com; pwalter@purissimawater.org; Jeffrey.provenzano@sanjoseca.gov; bill.tuttle@sjwater.com; juliann@stanford.edu; takel@akeleng.com; amy.fowler@ch2m.com; flau@sfwater.org; gary@fiske-assoc.com; jake.walsh@sjwater.com; planninginfo@calwater.com
Cc: Jerry De La Piedra; Cris Tulloch
Subject: Draft SCVWD UWMP
Date: Friday, April 01, 2016 4:36:00 PM
Attachments: Chapter 01 – Introduction and Overview.docx
Chapter 02 – Plan Preparation.docx
Chapter 03 – System Description.docx
Chapter 04 – Water Demands.docx
Chapter 05 - Baselines and Targets.docx
Chapter 06 - System Supplies.docx
Chapter 07 – Water Supply Reliability.docx
Chapter 08 – Water Shortage Contingency Planning.docx
Chapter 09 – Demand Management Measures.docx
Appendix D Water Demand and Agency Coordination.pdf
Appendix H Modeling Assumptions.pdf
Sierra Club Early Comments on 2015 UWMP.msg
image001.png

Hi all,

The District's draft UWMP is attached for your review and reference. We're hoping for comments by 4/15, because we're planning to have a public draft ready for review by 4/29/16.

I didn't include the appendices that are simply reports – I can provide them separately if you need them. Also, we're still working on the DWR checklist, DWR tables, and climate change vulnerability assessment.

We're still reviewing some of the language internally, so there could be some changes. And, some of the numbers may change between now and the end of April – we're reviewing our natural groundwater recharge projection and we might need to adjust some recycled water numbers.

Lastly, I attached a letter from the Sierra Club Loma Prieta Chapter about what they would like to see in our UWMP. San Jose Water Company got the same/similar letter.

Please let me know if you have questions and/comments.

Tracy

Santa Clara Valley
Water District

TRACY HEMMETER
SENIOR PROJECT MANAGER
Water Supply Planning and Conservation
Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118
(408) 630-2647
themmeter@valleywater.org

From: Tracy Hemmeter
To: "ajohnson@bawsca.org"; "jsimunovich@calwater.com"; "rsmelser@ci.gilroy.ca.us"; "nhawk@ci.milpitas.ca.gov"; "smachida@ci.milpitas.ca.gov"; "dan.repp@morganhill.ca.gov"; "Anthony.Eulo@morganhill.ca.gov"; "Elizabeth.Flegel@mountainview.gov"; "alison.turner@mountainview.gov"; "Iris.Lim@mountainview.gov"; "Karla.Dailey@CityofPaloAlto.org"; "cdegroot@santaclaraca.gov"; "mvasquez@santaclaraca.gov"; "jramirez@sunnyvale.ca.gov"; "mnasser@ci.sunnyvale.ca.us"; "tguster@greatoakswater.com"; "pwalter@purissimawater.org"; "Jeffrey.provenzano@sanjoseca.gov"; "bill.tuttle@sjwater.com"; "juliann@stanford.edu"; "takel@akeleng.com"; "amy.fowler@ch2m.com"; "flau@sfwater.org"; "gary@fiske-assoc.com"; "jake.walsh@sjwater.com"; "planninginfo@calwater.com"; "jchang@ci.milpitas.ca.gov"
Cc: Jerry De La Piedra
Subject: UWMP Public Hearing Notice
Date: Tuesday, May 03, 2016 2:04:00 PM
Attachments: image001.png

On April 26, 2016, the Santa Clara Valley Water District Board of Directors set the time and place for the public hearing on the Urban Water Management Plan (UWMP). The hearing is scheduled for Tuesday, May 24, 2016, at 6:00 pm. When the public review draft of the UWMP is ready, it will be posted at: http://www.valleywater.org/Services/WaterSupplyPlanning.aspx.

If you have a questions or comments, please let me know.

Thank you,
Tracy

Santa Clara Valley Water District

TRACY HEMMETER
SENIOR PROJECT MANAGER
Water Supply Planning and Conservation
Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118
(408) 630-2647
themmeter@valleywater.org

5750 Almaden Expressway, San Jose, CA 95118-3614 | (408) 265-2600 | www.valleywater.org

Santa Clara Valley
Water District

May 6, 2016

Subject: Santa Clara Valley Water District's 2015 Urban Water Management Plan

Dear Sir or Madam:

In accordance with the Urban Water Management Planning Act, water suppliers such as the District are required to review, update, and submit an Urban Water Management Plan to the California Department of Water Resources by July 1, 2016, and are required to encourage the active involvement of the public and to hold a public hearing prior to adoption of this plan.

The District's 2015 Urban Water Management Plan (2015 UWMP) documents important information on water supply, water usage, recycled water, water conservation programs, water shortage contingency planning, and water supply reliability in Santa Clara County. It also serves as a valuable resource for water supply planners and policy makers, and addresses the water supply outlook of Santa Clara County over the next 25 years. The 2015 UWMP updates and supersedes all previous District Urban Water Management Plans.

The District's Board of Directors has scheduled a public hearing to consider and take action on the 2015 UWMP at their meeting of Tuesday, May 24, 2016. The meeting will start at 6 p.m. at the Santa Clara Valley Water District Board Room located at 5700 Almaden Expressway, San Jose. Local agencies, water retailers, and the public are encouraged to review the 2015 UWMP and provide any comments prior to, or at, the public hearing.

The 2015 UWMP is available for public review at the District Headquarters Building (5700 Almaden Expressway, San Jose, CA 95118) between 8 a.m. to 5 p.m. weekdays or online at *http://www.valleywater.org/Services/WaterSupplyPlanning.aspx*.

For more information on the public hearing or the 2015 UWMP, please visit our website at www.valleywater.org or contact Tracy Hemmeter by phone at (408) 630-2647 or email at themmeter@valleywater.org.

Sincerely,

Garth C. Hall

Garth Hall
Deputy Operating Officer
Water Supply Division

Nina Hawk
City of Milpitas
455 E. Calaveras Blvd.
Milpitas, CA 95034-5479

Paul Kermoyan
City of Campbell
70 N. First Street
Campbell, CA 95008

Tom Capurso
City of Campbell
70 N. First Street
Campbell, CA 95008

David Brandt
City of Cupertino
10300 N. Wolfe Road
Cupertino, CA 95014-2232

Rick Smelser
City of Gilroy
7351 Rosanna Street
Gilroy, CA 95020

Susan Martin
City of Gilroy
7351 Rosanna Street
Gilroy, CA 95020

Steve Plasecki
City of Los Altos
One North San Antonio Road
Los Altos, CA 94022

Susanna Chan
City of Los Altos
One North San Antonio Road
Los Altos, CA 94022

Brian Leventhal
City of Monte Sereno
18041 Saratoga-Los Gatos Blvd
Monte Sereno, CA 95035

Andrew Crabtee
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037-4128

Karl Bjarke
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037-4128

Michael Fuller
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Randal Tsuda
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Mike Sartor
City of Palo Alto
250 Hamilton Avenue
Palo Alto, CA 94301

Michael Liw
City of San Jose
200 E. Santa Clara Street
San Jose, CA 95113-1905

Steve McHarris
City of San Jose
200 E. Santa Clara Street
San Jose, CA 95113-1905

Rajeev Batra
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050

Edwin Ordonez
City of Saratoga
13777 Fruitvale Avenue
Saratoga, CA 95070

John Cherbone
City of Saratoga
13777 Fruitvale Avenue
Saratoga, CA 95070

Manuel Pineda
City of Sunnyvale
456 W. Olive Avenue
Sunnyvale, CA 94086

Trudi Ryan
City of Sunnyvale
456 W. Olive Avenue
Sunnyvale, CA 94086

Kirk Girard
County of Santa Clara
70 W. Hedding Street, 7th Floor
San Jose, CA 95110

Mike Harrison
County of Santa Clara
70 W. Hedding Street, 7th Floor
San Jose, CA 95110

Richard Chiu Jr.
Town of Los Altos Hills
26379 Fremont Road
Los Altos Hills, CA 94022

Matt Morley
Town of Los Gatos
110 E. Main St
Los Gatos, CA 95030

The Mercury News

Tuesday, May 10, 2016

Ad Number:	**0005724045-01**	Advertiser:	**Santa Clara Valley Water District**
Insertion Number:	**N/A**	Agency:	**N/A**
Size:	**3 Col x 7.5 in**	Section-Page-Zone(s):	**B-5-All**
Color Type:		Description:	

Public hearing notice

Public Hearing to Consider Comments on the 2015 Urban Water Management Plan

Santa Clara Valley Water District

Topic: Santa Clara Valley Water District's 2015 Urban Water Management Plan

When: Time Certain at 6 p.m. on May 24, 2016

Where: Santa Clara Valley Water District Board Room
5700 Almaden Expressway
San Jose, CA 95118

In accordance with the Urban Water Management Planning Act, water suppliers such as the District are required to review, update, and submit an Urban Water Management Plan to the California Department of Water Resources by July 1, 2016, and are required to encourage the active involvement of the public and to hold a public hearing prior to adoption of this plan.

The District's 2015 Urban Water Management Plan (2015 UWMP) documents important information on water supply, water usage, recycled water, water conservation programs, water shortage contingency planning, and water supply reliability in Santa Clara County. It also serves as a valuable resource for water supply planners and policy makers, and addresses the water supply outlook of Santa Clara County over the next 25 years. The 2015 UWMP updates and supersedes all previous District Urban Water Management Plans.

For more information on the public hearing or the 2015 UWMP, please visit our website at www.valleywater.org or contact **Tracy Hemmeter** at **(408) 630-2647**.

Reasonable efforts will be made to accommodate persons with disabilities wishing to attend this public hearing. For additional information on attending this hearing including requesting accommodations for disabilities or interpreter assistance, please contact the **Office of the Clerk of the Board** at **(408) 630-2277**, at least three business days prior to the hearing.

4/2016_BA

Public Hearing Notice

Boardroom Technology Upgrade Project

Santa Clara Valley Water District

Who: Santa Clara Valley Water District

What: Public hearing on the Engineer's Report

When: May 24, 2016; Item is time certain at 6:00 P.M.

Place: Santa Clara Valley Water District; Boardroom
5700 Almaden Expressway, San Jose, CA 95118

The proposed work ofimprovement is described in the Boardroom Technology Upgrade Project Engineer's Report. The report is on file at the Clerk of the Board of Directors, 5700 Almaden Expressway, San Jose, California and on water district's website: ***http://www.valleywater.org/PublicReviewDocuments.aspx***

The objective of the project is to upgrade the existing 17 years old audiovisual system and bring it to the latest standards of video technology.

At the time and place fixed for the public hearing, the board of directors will receive comments on the Engineer's Report for the project. After considering the comments, the board will decide whether or not to proceed with the project.

For more information about this hearing or this project, contact **Sudhanshu Tikekar** at **(408) 630-2424**.

Reasonable efforts will be made to accommodate persons with disabilities wishing to attend this public hearing. For additional information on attending this hearing, including requesting accommodations for disabilities or interpreter assistance, please contact the **Office of the Clerk of the Board** at **(408) 630-2277**, at least three business days prior to the hearing.

04/2016_LG

The Mercury News

Tuesday, May 17, 2016

Ad Number:	**0005724045-01**	Advertiser:	**Santa Clara Valley Water District**
Insertion Number:	**N/A**	Agency:	**N/A**
Size:	**3 Col x 7.5 in**	Section-Page-Zone(s):	**B-6-All**
Color Type:		Description:	

Public Hearing Notice

Boardroom Technology Upgrade Project

Santa Clara Valley Water District

Who: Santa Clara Valley Water District

What: Public hearing on the Engineer's Report

When: May 24, 2016; Item is time certain at 6:00 P.M.

Place: Santa Clara Valley Water District; Boardroom
5700 Almaden Expressway, San Jose, CA 95118

The proposed work ofimprovement is described in the Boardroom Technology Upgrade Project Engineer's Report. The report is on file at the Clerk of the Board of Directors, 5700 Almaden Expressway, San Jose, California and on water district's website: ***http://www.valleywater.org/PublicReviewDocuments.aspx***

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04/2016_LG

Public hearing notice

Public Hearing to Consider Comments on the 2015 Urban Water Management Plan

Santa Clara Valley Water District

Topic: Santa Clara Valley Water District's 2015 Urban Water Management Plan

When: Time Certain at 6 p.m. on May 24, 2016

Where: Santa Clara Valley Water District Board Room
5700 Almaden Expressway
San Jose, CA 95118

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4/2016_BA

Climate Change Vulnerability Assessment

Appendix C - Climate Change Vulnerability Assessment

The Climate Change Vulnerability Assessment is taken from the Climate Change Handbook for Regional Water Planning, USEPA and DWR, 2011. The vulnerability assessment highlights those water-related resources that are important to a region and are sensitive to climate change.

The District has attempted to address all areas covered by this Assessment. At the end of this document, is an overview of many District efforts to adapt to the effects of climate change.

I. Water Demand

☑ *Are there major industries that require cooling/process water in your planning region?*
Yes, major industries include manufacturing, energy generation, food processing, and data centers.

☑ *Does water use vary by more than 50% seasonally in parts of your region?*
Yes, summer demands are typically about twice winter demands.

☑ *Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as how long heat lingers before night-time cooling, be prohibitive for some crops?*
The top 10 crops in Santa Clara County include nursery crops, mushrooms, several vegetable crops including lettuce and peppers, and wine grapes. Other fruit and nut crops of importance are cherries, apricots, and walnuts.

☑ *Do groundwater supplies in your region lack resiliency after drought events?*
The district has a robust managed groundwater system and diverse portfolio of water supplies. It may take more than one year to replenish groundwater reserves following drought, but the overall groundwater management and conjunctive use system is very resilient.

☑ *Are water use curtailment measures effective in your region?*
The current drought is a good example effective water use curtailment measures. The district, in collaboration with local water retailer, cities, and the county, implemented an extensive outreach campaign and offered increased rebates throughout the county. Local agencies coordinated to adopt consistent restrictions (e.g. a two day per week watering schedule). Private water companies implemented allocation programs. Through these efforts retailer water use demands were reduced by 27 percent in 2015 (compared to the base year of 2013).

☑ *Are some instream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?*
YES, in the recent drought of 2014 to 2016, early and persistent dry-back of streams occurred.

II. Water Supply

☑ *Does a portion of the water supply in your region come from snowmelt?*
More than half the county’s supply is from imported supplies originating in the Sierra Nevada and Cascade Range. Local supplies do not come from snowmelt.

☑ *Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?*
More than half the county’s supply is from imported supplies originating in the Sierra Nevada and Cascade Range.

☑ *Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?*
The principal water supply aquifer is not a coastal aquifer. However, some shallow aquifers adjacent to San Francisco Bay have been affected by salt water intrusion and high TDS is noted in some wells close to the Bay.

☐ *Would your region have difficulty in storing carryover supply surpluses from year to year?*
The District has local groundwater storage, local surface water storage, and Semitropic Groundwater Bank storage.

☐ *Has your region faced a drought in the past during which it failed to meet local water demands?*
The District has been able to meet demands during droughts through a combination of calls for water use reductions, use of reserves (groundwater, carryover, Semitropic, local surface), and supplemental supplies (transfers, exchanges, options).

☑ *Does your region have invasive species management issues at your facilities, along conveyance structures, or in habitat areas?*

The District actively manages many locations to remove invasive vegetation; primarily to establish and maintain native jurisdictional mitigation habitats (e.g., riparian woodlands, wetlands, creek banks), access along maintenance roads, fire suppression, and flood flow conveyance. Invasive vegetation management has included Countywide efforts to control giant reed (*Arundo donax*) and smooth cordgrass (*Spartina alterniflora*). Stewardship actions to remove invasive vegetation in support of native habitats, wildlife, and wildlife corridors are done through the District’s Safe, Clean Water and Natural Flood Protection Program.

There may exist other nonnative or exotic species such as nonnative fish. Some more concerning examples are those that extensively breed in our waters and have the greatest impact on native fish, and other species, such as: large-mouth bass, carp, and sunfish, red-eared slider turtle, and in the South SF Bay sloughs are striped bass.

The District does not currently have any invasive mussels which may affect water ways, but does have a mussel prevention strategy in place.

III. Water Quality

☑ *Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?*

The District's reservoirs that may be used as a source drinking water are located in non-urban upper watershed areas and are subject to the effects of wildfire. Wildfire can damage above ground infrastructure, such as water treatment plants located in the upper watersheds, and power distribution infrastructure. Wildfire can also have a negative effect on the upper watersheds above drinking water reservoirs. Runoff from storms after wildfires can carry increased amounts of sediment.

☑ *Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?*

Algal blooms have been observed in surface water bodies that are sources of supply.

☐ *Are seasonal low flows decreasing for some waterbodies in your region? If so, are the reduced low flows limiting the waterbodies' assimilative capacity?*

The District does not appear to be seeing evidence of overall long term reductions. Interannual variations are typical for this region.

☑ *Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?*

Several water bodies in the region have TMDLs/are listed as impaired. However, these impairments do not currently affect water supply-related beneficial uses.

☑ *Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?*

There are times where source water quality is impaired, but there is enough surface water flexibility in the system to optimize treatment strategies so that treatment operations can continue in most cases. However, the District has identified this as a potential future increased risk/vulnerability.

IV. Sea Level Rise

☑ *Has coastal erosion already been observed in yourregion?* – *Coastal erosion is expected to occur over the next century as sea levels rise.*
The County boarders the San Francisco Bay to the north. While there is vulnerability to shoreline habitat and structures from future SLR, the District is not aware of coastal erosion at this time. However, with SLR and increased storms, the risk may increase.

☑ *Are there coastal structures, such as levees or breakwaters, in your region?*
There are levees for flood protection and salt pond levees and other structure near/in the bay front area. This has been identified as vulnerability, but not to water supply.

☑ *Coastal structures designed for a specific mean sea level may be impacted by sea level rise. Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation) at less than six feet above mean sea level in your region?*

There are residential, business, utility/municipal/government facilities (waste water treatment plant, airfields) and transportation corridors in the bay front area that may be subject to increased risk from sea level rise. This has been identified as vulnerability, but not to water supply.

☑ *Are there climate-sensitive low-lying coastal habitats in your region?*

To prepare for the rising tides and potential coastal flooding along the South Bay shoreline, the District is developing a memorandum of understanding with the US Fish and Wildlife Service, owner of most of the salt ponds in the South Bay. The purpose of this memorandum is to develop a procedure for the District and USFWS to coordinate levee maintenance activities for the period of time until the Shoreline flood protection project comes online.

☑ *Are there areas in your region that currently flood during extreme high tides or storm surges?*

The district has experienced flooding as a result of tidal influence and has identified that as an increased vulnerability. There are many efforts to plan for increased risk, including but not limited to: preparing working guidelines for staff to incorporate sea level rise into planning and design of flood protection projects. This guidance should provide a consistent approach for considering sea level effects into District flood protection projects

☐ *Is there land subsidence in the coastal areas of your region*?
The northern portion of the Santa Clara Valley has experienced up to 13 feet of permanent subsidence historically due to long-term groundwater overdraft. However, permanent subsidence was effectively halted by the early 1970s due to the District’s comprehensive conjunctive water management programs.

☑ *Do tidal gauges along the coastal parts of your region show an increase over the past several decades?*

The area's specific tide gauge is the San Francisco Bay Golden Gate Tide Gauge. Tide gage data indicate that the global mean sea level is rising. Water level measurements from the San Francisco gage (CA Station ID: 9414290), indicate that mean sea level rose by an average of 2.01 millimeters (mm) per year from 1897 to 2006, equivalent to a change of eight inches in the last century.

V. Flooding

☑ *Does critical infrastructure in your region lie within the 200-year floodplain?*

The district is also a flood protection agency and has many efforts underway to address flood risks. In addition, the district has conducted a vulnerability assessment for water utility infrastructure as part of its Infrastructure Reliability Plan Update. Some of the district's service area (County of Santa Clara) transportation corridors and many high-tech industries are vulnerable to flooding. The district works closely with local agencies on hazard response and has an active Emergency Preparedness Program that meets FEMA NIMS standards and CalEMA and SEMS requirements.

☐ *Does part of your region lie within the Sacramento-San Joaquin Drainage District?*

The District is not located in this drainage area.

☑ *Does aging critical flood protection infrastructure exist in your region?*

The district is also a flood protection agency and has many efforts underway to address flood risks. The district is working to implement a rigorous asset management framework.

☑ *Have flood control facilities (such as impoundment structures) been insufficient in the past?*

In times of severe storms, some dams have had uncontrolled spilling and creek levees have overtopped. However, the district manages reservoir storage to minimize these events (even though the dams were not built for flood protection). Also, the district has a Capital Improvement Program and other efforts to improve flood protection along creeks.

☑ *Are wildfires a concern in parts of your region?*

The District's reservoirs that may be used as a source drinking water are located in non-urban upper watershed areas and are subject to the effects of wildfire. Wildfire can damage above ground infrastructure, such as water treatment plants located in the upper watersheds, and power distribution infrastructure. Wildfire can also have a negative effect on the upper watersheds above drinking water reservoirs. Runoff from storms after wildfires can carry increased amounts of sediment.

VI. Ecosystem and Habitat Vulnerability

☑ *Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?*

The district is also a flood protection agency and environmental steward of waterways and has many efforts underway to address this in addition to its existing habitat and stream management functions.

☑ *Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?*

The County borders the San Francisco Bay to the north. The District has multiple restoration and enhancement projects that strive to improve vegetative communities for local wildlife and native plant diversity, increase native canopy cover and carbon dioxide (CO2) sequestration to reduce climate change effects, increase in-stream shading to lower water temperatures for fish, and enhance habitat connectivity for wildlife migration. These projects utilize adaptive management strategies to more readily address changing climatic conditions in the future.

☑ *Do climate-sensitive fauna or flora populations live in your region?*

The District has many sensitive or special and sensitive species in the regions. Changes in climate and weather can compromise weakened or unhealthy ecosystems. Among many efforts, the District is developing a habitat conditions database to monitor effects of climate change and develop adaptive measures.

☑ *Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?*

Santa Clara County has many sensitive or special and sensitive species. Changes in climate and weather can compromise weakened or unhealthy ecosystems. Among many efforts, the District is developing a habitat conditions database to monitor effects of climate change and develop adaptive measures.

☑ *Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?*

There are many freshwater and bay front recreational areas. The District collaborates with other agencies and stakeholders to protect and promote enhancement of these activities.

☑ *Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?*

District's surface water operations that are subject to CA Fish and Game Code, such as Lake and Streambed Alteration Agreements that include flow objectives to support fish and aquatic habitat based on rainfall and local conditions.

☑ *Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in yourregion?*

The County borders the San Francisco Bay to the north and that area contains estuaries, wetlands and marshes. Current projects that support ecosystem resiliency include the South Bay Salt Pond Restoration Project which will minimize bayfront impacts from sea level rise by providing a wetland buffer and attenuation of high tides. The Shoreline Flood Protection Project will not only have the ability to enhance flood protection for our bayfront communities, it should also provide improved ecotones and habitat connectivity for wildlife. The District awarded the San Francisco Bay Bird Observatory a grant of $690,000 to plant native vegetation on the South Bay Salt Pond levee slopes to enhance wildlife habitat connectivity and reduce wave damage.

☑ *Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change?*

The District borders the Bay-Delta. Current projects that support ecosystem resiliency include the South Bay Salt Pond Restoration Project which should minimize bayfront impacts from sea level rise by providing a wetland buffer and attenuation of high tides. The Shoreline Flood Protection Project will not only have the ability to enhance flood protection for our bayfront communities but also provide improved ecotones and habitat connectivity for wildlife. The District awarded the San Francisco Bay Bird Observatory a grant of $690,000 to plant native vegetation on the South Bay Salt Pond levee slopes to enhance wildlife habitat connectivity and reduce wave damage.

☑ *Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Are there infrastructure projects planned that might preclude species movement?*

As a part of the District's environmental stewardship mission, it attempts to prevent species impacts and provides enhancements. It is also party to the Santa Clara Valley Habitat Plan. The District has multiple restoration and enhancement projects that strive to improve vegetative communities for local wildlife and native plant diversity, increase native canopy cover and carbon dioxide (CO_2) sequestration to reduce climate change effects, increase in-stream shading to lower water temperatures for fish, and enhance habitat connectivity for wildlife migration. These projects utilize adaptive management strategies to more readily address changing climatic conditions in the future.

The District awarded the San Francisco Bay Bird Observatory a grant of $690,000 to plant native vegetation on the South Bay Salt Pond levee slopes to enhance wildlife habitat connectivity and reduce wave damage.

The District recently completed all required land preservation for its Stream and Watershed Preservation Program. Over 3,600 acres of upper watershed lands in various parts of Santa Clara County have been protected as a part of this program. Ongoing monitoring and land management activities continue to ensure that the conservation values of the preserved land are maintained.

VII. Hydropower

☑ *Is hydropower a source of electricity in your region?*

The district operates a small hydroelectric facility at Anderson Dam. The district also relies on power from PWRPA, which relies on hydroelectric.

☑ *Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?*

Part of the District's program to achieve carbon neutrality is the Energy Optimization Program, which includes maintaining a portfolio of existing alternative energy sources, increasing energy conservation and efficiency, and developing opportunities for alternative energy.

SUPPLEMENTAL INFORMATION BEYOND THE VULNERABILITY ASSESSMENT

OVERVIEW OF DISTRICT CLIMATE CHANGE ADAPTATION EFFORTS

As the primary water resources agency for Santa Clara County, the District manages an integrated water resources system that includes the supply of clean, safe water, natural flood protection, and stewardship of streams on behalf of Santa Clara County's nearly 1.9 million residents.

The District's ability to provide those services is challenged by the potential of warmer temperatures, changing precipitation and runoff patterns, reduced snow pack, and rising sea levels. Managing climate change related uncertainties, vulnerabilities, or risks to local water resource management is critical to fulfill the District's mission.

The following sections describe adaptation activities, organized by District function.

1. Activities Related to Water Supply

To address the challenges of an uncertain future and imprecise projections of future conditions and potential impacts on water supplies, the District relies on its long term planning efforts that continually develop and improve resilient and adaptable water supplies and strategies and consider changing conditions. The District is preparing to update its 2012 Water Supply and Infrastructure Master Plan (Water Master Plan) in 2017. The plan is reviewed annually and updated every five years to evolve to changing conditions. The 2017 update will build upon the Board approved strategies to secure and optimize the use of existing supplies and infrastructure and meet future increases in demands with conservation and recycling. The Water Master Plan will continue to develop elements that adapt well to future climate changes. The current elements are presented below.

<u>Manage water use demands</u> – Current and planned water conservation programs are projected to achieve about 99,000 acre-feet per year (AFY) of water savings per year by 2030, when demands are projected to be about 410,000 AFY. A new initiative is to work with land use agencies and water retailers to develop a model water efficient development ordinance. More efficient water use in existing and new developments will help manage change in demands due to climate change.

<u>Provide drought-proof supplies</u> – Non-potable recycled water use is projected to expand from about 22,000 AFY in 2014 to 30,000 AFY by 2035. The District is also setting the stage for developing potable reuse, which is anticipated to provide at least 20,000 AFY of drought-proof supply for groundwater recharge and/or injection.

<u>Secure imported water supplies</u> – About 40 percent of the county's water supply is conveyed through the Sacramento-San Joaquin Delta. Reduced precipitation and sea level rise are significant threats to the reliability of these supplies and the Delta ecosystem. The District is working with local, state, and federal agencies to develop solutions to address climate change and other threats to the Delta environment and water supply reliability.

<u>Increase system flexibility</u> – The District's integrated water system provides significant flexibility in managing supplies. Maintaining and rehabilitating the system, including dam retrofits, will be critical for managing the increased frequency of extreme events that are anticipated in a changing climate. In addition, the Water Master Plan includes developing a new reservoir pipeline and additional groundwater recharge ponds to better utilize existing water supplies, especially during high storm flows and wet years. Future strategies may include additional surface and/or groundwater storage.

Compile and analyze data – The District continues to compile and analyze data that could provide insights into potential local changes in runoff, water quality, and water use demands.

2. Activities Related to Fluvial and Tidal Flood Protection

a. In order to better understand the potential impacts of climate change on flood hydrology, the District has contracted with Santa Clara University (SCU) to downscale global climate modeling results to the Santa Clara County area. Various climate-change scenarios for different target years and greenhouse-gas emission levels were considered. This contract service also allows the District to assess statistically the impact of climate change on precipitation amounts. The data was provided in December 2015 for staff review and comment. Staff is working with SCU to provide the final dataset. When complete, this information will support both water utility and watershed planning.

b. The District started coastal flood mapping for various sea level rise (SRL) scenarios. The mapping was completed in November 2015. A meeting with the cities has been scheduled for April 20, 2016 to communicate the inundation maps and parcel counts for cities' planning purposes.

c. Flood warning systems for four watersheds, San Francisquito, Upper Guadalupe, Thompson and West Little Llagas creeks, were completed in FY15. The storms of December 11, 2014 and March 4-6, 2016 provided opportunities to test and verify the system operation. The system will be expanded to include Uvas (FY16) and Coyote-Upper-Penitencia creeks (FY17). For this effort, the Flood Management Association bestowed the District the Award for Outreach and Communications in its 2015 annual conference.

d. The District is partnering with Colorado State University and National Oceanic and Atmospheric Administration's National Weather Service to conduct a pilot project using a ground-based radar system that can provide more accurate rainfall forecast and mapping. This additional information with data from a network of District's rain gauges and stream gauges can improve the District's ability to predict, coordinate for, and respond to creek flooding. This pilot project will run from February to April 2016.

e. To prepare for the rising tides and potential coastal flooding along the South Bay shoreline, the District is developing a memorandum of understanding with the US Fish and Wildlife Service (USFWS), owner of most of the salt ponds in the South Bay. The purpose of this memorandum of understanding is to develop a procedure for the District and USFWS to coordinate levee maintenance activities for the period of time until construction of the Shoreline flood protection project is completed. In FY15, the District spent $250,000 to repair the salt pond levees to maintain their flood protection function.

f. The District is also preparing working guidelines for staff to incorporate SLR into planning and design of flood protection projects. This guidance will provide a consistent approach for considering SLR effects on design of District's flood protection projects.

3. Activities Related to Ecosystem Resiliency

The District has multiple restoration and enhancement projects that strive to improve vegetative communities for local wildlife and native plant diversity, increase native canopy cover and carbon dioxide (CO_2) sequestration to reduce climate change effects, increase in-stream shading to lower water temperatures for fish, and enhance habitat connectivity for wildlife migration. These projects utilize adaptive management strategies to more readily address changing climatic conditions in the future.

a. Current projects that support ecosystem resiliency include the South Bay Salt Pond Restoration Project which should minimize bayfront impacts from sea level rise by providing a wetland buffer and attenuation of high tides.
b. The Shoreline Flood Protection Project will not only have the ability to enhance flood protection for our bayfront communities but also provide improved ecotones and habitat connectivity for wildlife.
c. The District awarded the San Francisco Bay Bird Observatory a grant of $690,000 to plant native vegetation on the South Bay Salt Pond levee slopes to enhance wildlife habitat connectivity and reduce wave damage.
d. The District's water conservation program provides rebates to homeowners and businesses for converting high water use landscapes to climate appropriate plants and permeable landscapes.
e. The District recently completed all required land preservation for its Stream and Watershed Preservation Program. Over 3,600 acres of upper watershed lands in various parts of Santa Clara County have been protected as a part of this program. Ongoing monitoring and land management activities continue to ensure that the conservation values of the preserved land are maintained.

Water Demand and Agency Coordination

Appendix D

Appendix D – Water Demand and Agency Coordination

This Appendix describes the methods for determining the projected future water demand for the Santa Clara Valley Water District's (District) 2015 Urban Water Management Plan (UWMP). This Appendix supplements Chapter 4 – Water Demand and documents District efforts to coordinate water demand projections and land use planning assumptions.

The demand estimates for the major retailers were provided by the water retailers and are meant to be consistent with their UWMPs and local planning assumptions. The District coordinated with the water retailers and the local planning agencies on demand projections to the extent practicable. In addition, the District evaluated potential climate change impacts on demands.

D.1 Development Of Water Demand Projections

D.1.1 Countywide Water Supply Projections

The District calculates demands for the entirety of water use within our service area by aggregating water demand reported from all retailers in the service area (as recommended by DWR). This information is presented in Table 1. The 'TOTAL' projection also includes independent groundwater pumping, agricultural groundwater pumping, raw water deliveries to surface water customers, and treated water system losses.

D.1.1.1 Retailer Demands

The retailer demands presented in Table 1 (taken from Chapter 4 of the 2015 UWMP) are based on projections provided by the thirteen water retailers. However, the District refers the reader to the water retailers' published UWMPs for final water demand projections.

Table 1. Countywide Demand Projection (AF)

Sector	2020	2025	2030	2035	2040
Water Retailers					
Cal Water Service Company	15,200	15,500	15,800	16,100	16,400
Gilroy, City of	11,700	13,400	15,000	16,000	17,100
Great Oaks Water Company	9,500	10,100	10,800	11,600	12,500
Milpitas, City of	17,800	19,800	21,900	24,600	24,600
Morgan Hill, City of	8,600	9,800	11,000	12,100	12,100
Mountain View, City of	12,500	12,700	13,000	13,300	13,700
Palo Alto, City of	12,000	11,600	11,400	11,100	11,000
Purissima Hills Water District	2,100	2,100	2,100	2,100	2,100
San José Municipal Water	35,200	38,500	42,100	45,800	45,800
San Jose Water Company	144,600	152,100	158,400	163,800	169,400
Santa Clara, City of	27,600	29,500	29,900	30,600	31,400
Stanford University	3,400	3,700	3,900	4,300	4,700

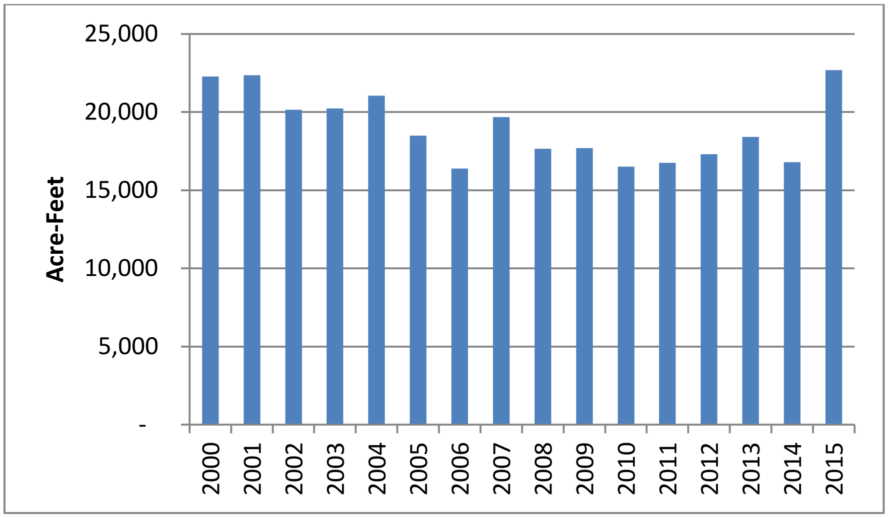
Sunnyvale, City of	22,800	24,300	24,900	25,700	25,800
Agricultural Groundwater Pumping	26,000	26,000	26,000	26,000	26,000
Independent Groundwater Pumping	17,600	17,600	17,600	17,600	17,600
Losses (District TW Conveyance)	1,700	1,700	1,700	1,700	1,700
Raw Water	2,900	3,000	3,100	3,200	3,200
TOTAL	**371,200**	**391,400**	**408,600**	**425,800**	**435,100**

D.1.1.2 Independent Groundwater Pumping

Independent groundwater pumping includes groundwater pumping by individual domestic well owners, small and mutual water companies, businesses, non-agricultural irrigation, and environmental cleanup. It is all non-retailer groundwater pumping in the Municipal and Industrial (M&I) and Domestic categories.

The independent groundwater pumping demand estimate is based on the average of 2005 to 2014 actual water use held constant into the future. The demand is held constant due to the mix of uses in this sector that cannot be summarized by any one published growth projection or study. There are too many variables to create reasonable growth scenarios. Maintaining the current demand is an appropriate and conservative approach. If future water uses in this aggregated sector changes considerably in the future, the District will evaluate future conditions at that time.

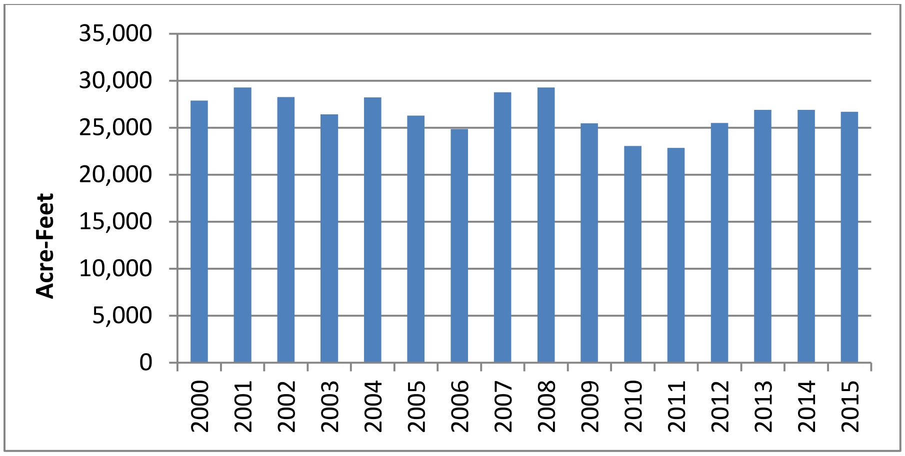
Figure D-1. Independent Groundwater Pumping



D.1.1.3 Agricultural Groundwater Demand

Agricultural groundwater pumping[1] averaged 25,980 acre feet annually between 2005 and 2014. The District held the projected demand constant into the future based on published studies, reports, and land use plans. Hydrology is probably the largest factor in agricultural water use, and the annual variations illustrated in Figure D-2 are expected to continue into the planning horizon. Historically, there is evidence of significant reductions in harvested acres and in agricultural water use. The number of harvested acreage declining over time is the result of both increasing urban development and higher productivity (resulting in growth in the value of agriculture per acre and per worker). However, land use plans and agricultural reports indicate that the amount of harvested acreage is likely in a stable state, with only minor declines due to increased urban development. Furthermore, the labor force in the sector does not show projected declines of any significance until 2030 (ABAG Plan Bay Area 2013). Even if labor does decline, unlike other sectors, this does not necessarily equate to reduction in water demand. In addition, a review of groundwater use in the agricultural sector shows only a slight decline, similar to what the county has seen in the M&I sector.

Figure D-2. Agricultural Groundwater Pumping



D.1.1.4 Distribution System Water Losses

Distribution system water losses (also known as "real losses") are the physical water losses from the water distribution system and the supplier's storage facilities, up to the point of customer consumption. As required by DWR, the District quantified its distribution system losses using the DWR Water Audit Method. A copy of the District's Water Loss Audit is in Appendix E.

D.1.1.5 Raw Water

A small amount of untreated imported and local surface water is available to surface water customers and is considered 'raw water' (Untreated Water Program). The water is used primarily for landscape and agricultural irrigation. The District is currently updating its Untreated Water Program rules and anticipates reducing deliveries for residential landscaping. In addition, some customers anticipate switching to

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[1] Groundwater pumping volumes are based on the volumes metered by the District or reported to District.

recycled water. Therefore, to estimate future demands for this sector, the District used the average of historic use for customers that are anticipated to remain in the program and held that demand at a constant rate into the future.

D.1.2 Recycled Water Supply Projection

Recycled water demand projections were developed to inform water supply reliability modeling for the District's 2015 UWMP. This demand projection table was taken from Chapter 6 – System Supplies.

The non-potable recycled water supply projection in Table 2 is based on recycled water use estimates provided by the water retailers over the planning horizon.

Table 2. Non-Potable Recycled Water Supply Projection (AF)

Service Area	2020	2025	2030	2035	2040
South Bay Water Recycling					
Milpitas	2,500	2,700	2,900	3,100	3,100
San Jose Muni	5,600	6,200	6,800	7,400	7,400
San Jose Water Company	4,100	6,900	8,400	8,400	8,400
Santa Clara	4,700	5,700	6,100	6,500	6,900
Sunnyvale Water Pollution Control Plant					
California Water Service Company	500	500	500	500	500
Sunnyvale	1,500	1,600	1,700	1,700	1,700
Palo Alto Regional Water Quality Control Plant					
Mountain View	1,000	1,100	1,100	1,100	1,100
Palo Alto	900	900	900	900	900
South County Regional Wastewater Authority					
Gilroy	2,600	3,200	3,700	3,700	3,700
Total[2]	23,300	28,500	31,900	33,100	33,500

D.2 Coordination with Land Use Planning

The development of the water demand projections included coordination with water utilities and land use agencies, where feasible. A summary of coordination meetings as of the final draft of this UWMP is below:

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[2] The total recycled water projection does not match the sum of the individual rows due to rounding.

Table 3: Coordination Meeting Efforts

Retailer	Cities	Notes
Mountain View	Mountain View	Met on 3/28/16
California Water Service Company	Los Altos and portions of Cupertino, Los Altos Hills, Mountain View, and Sunnyvale	Met 4/7/2016
Gilroy	Gilroy	Met 4/4/2016
Morgan Hill	Morgan Hill	Met 4/20/2016
Palo Alto	Palo Alto, served by SFPUC	Met 4/28/2016
San José Municipal Water	North San José, Alviso, Edenvale, Evergreen and Coyote service areas	E-mail response 3/30/2016
San Jose Water Company	Portions of San Jose, Los Gatos, Monte Sereno, Saratoga, Campbell and Cupertino	Met 4/7/2016
Great Oaks Water Company	Blossom Valley - Santa Teresa - Edenvale - Coyote Valley-Almaden Valley areas of the City of San Jose	Met 4/21/2016
Milpitas		Awaiting response
Santa Clara		Meeting being scheduled
Sunnyvale		Met 4/20/2016
Purissima Hill Water District		Met 4/5/2016
City Planning		
Campbell		Reviewed planning documents. Planning staff provided written comments to request for meeting e-mail.
Cupertino		Reviewed planning documents
Los Gatos		Reviewed planning documents
Saratoga		Reviewed planning documents
Monte Sereno		Reviewed planning documents

D.2.1 Regional Planning Projections

The first District effort in estimating the countywide demand for this UWMP was to project water demands using the IWRMain Water Demand software and using ABAG projections from 2013 Plan Bay Area. Plan Bay Area has an open, inclusive public outreach process. The plan notes that "…non-profit and business communities also played a key role in shaping the plan. Business groups highlighted the need for more affordable workforce housing, removing regulatory barriers to infill development, and addressing infrastructure needs at rapidly growing employment centers. Environmental organizations emphasized the need to improve transit access, retain open space, provide an adequate supply of housing to limit the number of people commuting into the region from nearby counties, and direct discretionary transportation funding to communities building housing in PDAs. Equity organizations focused on increasing access to housing and employment for residents of all income categories throughout the region, and establishing policies to limit the displacement of existing residents as PDAs grow and evolve. All of these diverse voices strengthened this plan".

Estimating future water demand using the IWRMain Water Demand software and using ABAG projections is useful as the modeling can be done countywide or for smaller service areas in our water supply modeling environment. In fact, demand projection studies were done for the retailer service areas, in addition to countywide. Since the District needs to consider demand countywide, it cannot rely on retailer data alone. Another benefit of this effort was to understand the potential effects on demand from growth as projected in the Assocation of Bay Area Government (ABAG) Plan Bay Area 2013, if Plan Bay Area growth in population and jobs were realized. Plan Bay Area incorporates local and regional planning assumptions for population, housing, jobs and transportation.

For this analysis, the District used retailer monthly billing and sales data from 2013 (a pre-drought restrictions demand year) as input of base year water use into the District's IWRMain water demand model. The ABAG growth projection sectors (housing and jobs), US Census data on housing types, and retailer water use sectors were matched to create growth factors, which were then applied to the baseline water retailer billing sector water use values. In order to associate the Plan Bay Area Growth with the non-municipal retailer service area (or retailers with boundaries other than the city boundary), data was obtained from ABAG by Census Tract. This information was incorporated into the District GIS system to match to census tracts to those within the particular service area. In addition, the US Census data on housing types was used to breakdown the service areas by housing type, i.e., single-family residential versus multi-family residential. Job growth was estimated in the same fashion. District staff associated the water retailer billing sector with ABAG's job sectors, and the sector growth was derived from Plan Bay Area at the city boundary or census tract level where needed. In summary, the demand model uses the growth from Plan Bay applied to each water use sector to project future water use demand for that sector. While Plan Bay Area played an important role in this demand exercise, by helping the District understand growth trends by sectors, the District does not rely on these projections. The District understands the limitation of this regional study and understands the importance of coordinating with local water retailer plans and city and county general plans. The results of this modeling effort is compared to the results of the combined demands provided by the water retailers in Table 4. Table 4 contains summary demands for the retailer service areas. Consideration of future increases in water conservation savings varies among the models. Some sectors include embedded conservation, some added savings projected by 2020, and others may have included savings from new water use efficiency programs into the future. Therefore, these are not appropriate for direct comparison. But the summary of the two different demand efforts show very good agreement.

Table 4: Summary Water Retailer Demand Projections (AF)

Source	2020	2025	2030	2035	2040
Retailer Supplied Projections	322,994	343,019	360,213	377,313	386,613
District IWRMain Model	320,960	332,567	344,573	357,395	370,796
% Difference	1%	3%	4%	5%	4%

D.2.2 Water Retailer Coordination

The water retailer coordination efforts included collecting the retailers' independent water use projections for their service areas, and then meeting to discuss the growth assumptions and associated planning documents utilized by the retailer. The District promoted having land use planning staff present at the meetings where appropriate, or in other cases have planning agency information available. These meetings were valuable in understanding the retailers' projections and underlying assumptions regarding growth, including identifying source documents such as city general plans or ABAG regional planning projections.

After receiving the water retailers' water use projections, the retailer projections were compared to previous UWMPs and to the District's IWRMain demands based on ABAG Plan Bay Area 2013 (described above in Section D.2.1 Regional Planning Projections). Overall, the retailers' 2015 demand projections are lower than those in the 2010 UWMP. The comparison between the retailers' and the District's demand projections resulted in some variations between the two. When comparing the totality of the two, the total demands were within 2 percent to 5 percent of each other, depending on the projection year, with the difference increasing further into the future. It should be noted there are many reasons that the demands may differ - differences in base years, models, assumptions on growth, conservation factors, etc. Nevertheless, given the many ways models can differ and that the two projections are relatively close, it adds confidence that the growth scenarios considered in the regional planning document, Plan Bay Area from ABAG, and those considered by the individual retailers have overall alignment in the countywide demand projection. As mentioned, the District also made an effort to meet or discuss the planning basis and demand assumptions with each retailer, and some of the planning agencies. This coordination assists in understanding the planning assumptions and also adds confidence in the demand scenarios.

One result of the coordination showed that retailers used different land use planning assumptions in their demand models. Many derive their growth projections directly from population projections in city land use plans and others use ABAG projections, and some use a model with a combination of local plans and known or historic growth considerations. Very few retailers showed their projected demands by water use sectors as was done in the District's and BAWSCA's demand studies. The exercise was useful in that it provided the District with more understanding about the differences between the District's and retailers' underlying assumptions.

The District refers the reader to the water retailer UWMPs for their most recent demand projections, modeling efforts and assumptions. The retailer projections provided to the District prior to the public review draft of the UWMP are shown in Table 4-1.

During the coordination meetings or discussions, District staff collected information following these lines of investigation, as appropriate.

Retailer Staff Questions:

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?
2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions?
3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?
4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)

The responses for each retailer are included at the end of this appendix. The basis for the retailers demand projections are summarized in Table 5 and includes the coordination effort with the associated land use agency where it is relevent.

Table 5: Retailer Coordination with Planning

Retailer	Service Area	Documents used in demand projections and major underlying growth assumptions	Retailer and City Planning Coordination
California Water Service	Los Altos and portions of Cupertino, Los Altos Hills, Mountain View, and Sunnyvale	US Census; historic service area statistics and data by service area; reviewed General Plans and ABAG projections; Water Supply Assessments	Sent water use projection and UWMP documentation to each city planning department.
Gilroy	City of Gilroy	City General Plan current draft	Retailer and consultant coordinated with planning staff regularly.
Great Oaks Water Company	Blossom Valley - Santa Teresa - Edenvale - Coyote Valley-Almaden Valley areas of the City of San Jose	Past growth rates, ABAG projections, and San Jose's Envision 2040	Retailer review of Envision 2040
Milpitas	City of Milpitas	*Awaiting Response*	
Morgan Hill	City of Morgan Hill	City General Plan current draft	Retailer and consultant coordinated with planning staff regularly.
Mountain View	City of Mountain View	Approved General Plan 2013	Retailer staff coordinated with city planning staff
Palo Alto	City of Palo Alto	ABAG Projections	Meeting scheduled
Purissima Hills Water District	6,400 residents and 10 institutional customers in Los Altos Hills	BAWSCA Demand methodology, which includes: Plan Bay Area - ABAG Projections 2013, individual agency 2010 UWMPs, California Department of Finance, the United States Census	Refer to BAWSCA demand study documents

Retailer	Service Area	Documents used in demand projections and major underlying growth assumptions	Retailer and City Planning Coordination
		Bureau, or agency planning documents	
Santa Clara	City of Santa Clara	*Awaiting Response*	
San Jose Municipal Water	North San José, Alviso, Edenvale, Evergreen and Coyote service areas	*Awaiting Response*	
San Jose Water Company	portions of San Jose, Los Gatos, Monte Sereno, Saratoga, Campbell and Cupertino	ABAG Projections	Retailer relied on ABAG coordination with land use agencies. District staff reviewing Land Use Agency documents
Sunnyvale	City of Sunnyvale	General Plan	Retailer coordinated with planning staff

D.2.3 Planning Agency Coordination

Even though there was close alignment between the overall District demands projections and retailer demands, the District wanted to ensure that the underlying planning assumptions were well understood for each of the service areas, and therefore conducted efforts to consider relevant general plan and housing element information by either consulting directly with the retailers and planning staff or reviewing available planning documents. Where appropriate, planning staff were included in the discussions with retailers, or staff reviewed general plans and ABAG projections prior to meeting with the retailers. In some cases, the coordination with the planning staff could be done separately due to situations where city boundaries and retailer service areas do not coincide. This coordination effort is ongoing at the time of the preparation of the final draft of this UWMP. The result of this effort shows the District's attempt to consider relevant general plan and housing element information either directly from the cities, and/or consulted directly with the retailers and planning staff. As a part of the retailer coordination, the District is able to document the basis for growth utilized for the retailer demand, what general plan or new developments were considered in growth, and also whether ABAG's listed Priority Development Areas were considered. The amount of coordination and document review conducted for each service area was different based on need and availability of documents and staff availability.

As part of the coordination, either through meetings or document review, District staff asked questions such as those listed below (where appropriate). The amount of coordination and document review conducted for each service area was different based on need, availability of documents, and planning staff availability.

Planning Staff Questions

1. What developments are known or possible that are not clearly identified in the city's General Plan (GP), Housing Update (HU) or other appropriate PUBLISHED city planning documents?
2. Does the city's GP, HUs, or other planning consideration place a priority on following regional coordination growth plans such as ABAG and Plan Bay Area efforts, or otherwise find conflicts between city plans and external regional planning such as ABAG.
3. What developments are known or possible that are not clearly identified in ABAG's "2013 Bay Area Plan Projections"? (Such as Priority Development Areas (PDAs) page 100)
4. Are there any known future shifts in high water use economies, such as cooling needs, industry, large irrigated turf, etc? Specifically in South County, changes in agricultural use or open space land use designations.
5. Any known or anticipated large annexations or other considerations that would change the city boundaries or amendments to the urban service areas (USA) or spheres of influence (SOI), that would have the potential to change known or anticipated housing, population or growth projections?

D.3 Assumptions and Considerations For Long Term Demand Projections

The District realizes as with any longterm look into the future of water supply, water demand, demographics or hydrology, that no one planning framework or model can be a predictor of the future. As articulated by George E. P. Box in Empirical Model-Building and Response Surfaces (1987):

> "Remember that all models are wrong; the practical question is how wrong do they have to be to not be useful." p. 74. And, "Essentially, all models are wrong, but some are useful." p. 424

This is one reason why the District attempted to be inclusive of more than one specific modeling or planning environment, and attempted to coordinate with others and document planning assumptions. All this work may not lead to a more correct outcome, but can help to inform planners and decision makers of limitations on the information. This information can also inform decision makers about what projections may be more realistic than others, since no one projection or plan is likely to be 'right'. Lastly, the District will take all of this information to develop a range of scenarios to consider in the long-term water supply planning process. The District has been using scenario, portfolio development and risk based planning tools since the 1990s.

The District also recognizes that the near term and potentially long term water demand may be considerably affected by the recent and unprecedented statewide drought conditions of 2012 to 2016. This event has already affected demand as the public has changed attitudes and as water use restrictions have been put in place. Some of the water use efficiency successes and changed behavior will last into the future. But if the past is a guide, we also realize that some rebound of water use will likely occur within a few years of removing water use restrictions. This drought and the local and statewide efforts to date may likely lead to new policy or technological enhancements that may reduce future demands in ways that cannot be currently predicted. The District is watching and participating in local and statewide forums in which future changes are already being considered. For instance, it is quite likely that the State will continue its mandates for water use efficiency and may call for a statewide 2030 target, similar to the 20% by 2020 regulation of SBx7-7. Also, the District is participating on a local effort to develop of Model Ordinance for New Development that may require further innovations in water use efficiency and alternative water sources.

There is also the possibility of the convergence of drought conditions and regional growth. Certainly, businesses and residents will make future decisions based on economic and environmental sustainability of a region that could also affect growth in ways that cannot be accurately anticipated. Climate change also plays a role in the prospects for the future. In one way, climate change may cause long term or seasonal increases in demand. Conversely, as regions prepare for climate change, the way land and water are used and developed may also change that could result in reduced demand.

Since District staff recognizes the limitations associated with demand projections, it will continue to coordinate with the water retailers and land use agencies (and regional and statewide efforts) to better understand a realistic future for which to plan for. Following the approval and submittal of this 2015 UWMP, the District will continue its long term planning work as it updates its Water Supply and Infrastructure Master Plan (Water Master Plan). The Water Master Plan presents the District strategy for ensuring a reliable future water supply in an efficient and effective manner. The plan is reviewed annually and updated every five years along with the companion UWMP. This allows the district to adjust to changing conditions and protect against over or under investing in our future water supply as conditions and assumptions change.

Appendix D – Water Demand and Agency Coordination

Coordination with Retailers and Planners and Land Use Agency Document Review Notes:

The following pages include notes from the coordination meetings and District staff review of various land use planning documents.

California Water Service: Los Altos Service Area, Jonathan Keck, **4/20/2016**

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?

   a. Water demand projections use historical data by sectors (revenue class). Service growth percentages and demand per service have been tracked since the early 1980s. This allows for the development of summary statistics based on various historical frequencies (e.g., 5-yr, 10-yr, 20-yr). Projections are then made by combining service growth with demand per service. Variability is accounted for by using one standard deviation above and below the average or expected trend value. This ultimately results in a "bracketed" projection. US Census data is used in available base years to help anchor and/or confirm our overall projection methodology.. City General Plans and ABAG projections are also reviewed for consistency against our own projection results.
   b. Cal Water tracks developments and determines if Water Supply Assessments are needed. Then, they determine if the development is within the bounds of their projections. If so, they issue 'Will Serve' letters
   c. Cal Water's Water Supply and Facility Master Plan included a landuse based projection and growth and will be updated in a few years.
   d. Please refer to attached data.

2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions?

Cal Water is not aware of any conflicts between assumptions and ABAG or GPs. Cal Water sent letters to each of the cities' planning departments within their service area to seek assistance in reviewing and advising Cal Water with respect to one of the key elements of the plan, which is the development of a growth forecast for their district (Aug/Sept 2015). Review comments were incorporated into our projections before developing our draft UWMP data tables and appendices (late 2015, and very early 2016).

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?

   a. Developments specifically included are documented by WSA's and Will Serve letters.
   b. Please refer to attached data.

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)

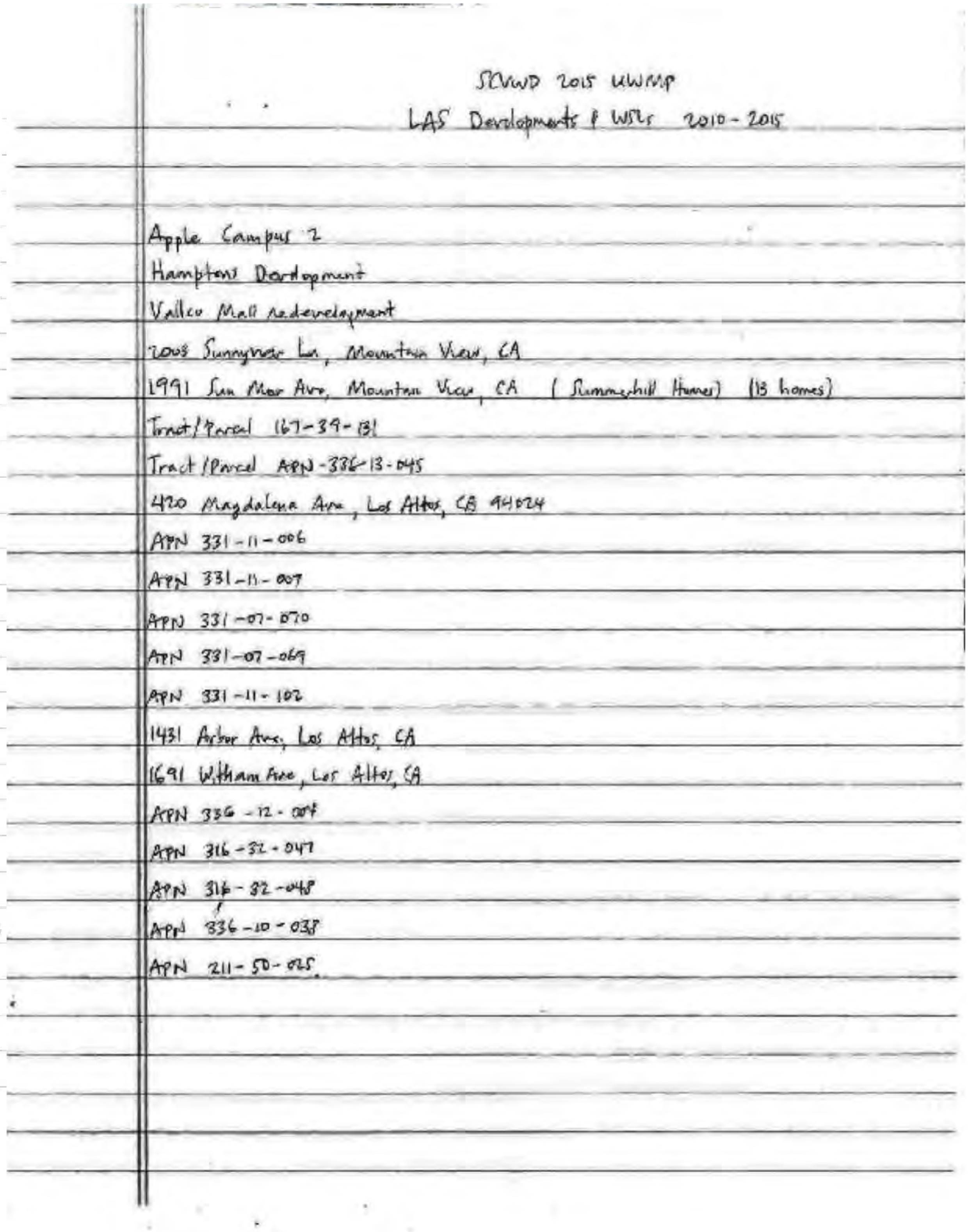
   a. Major changes are documented in WSA's. One of the most significant future changes will be the new Apple Campus.

b. For the Los Altos area, there is not too much boundary growth. Mostly infill developments or tear down and replacements.

Table 1 From Cal Water - Recent Projects

DEVELOPER_NAME	PS_PROJECT_DATE	PROJECT_STATUS
Sal Giovannotto	41506	Completed
Old Trace, LLC	41879	Completed
Apple Inc.	42030	In Design
86 3rd St, LLC	41960	Completed
Santa Clara Valley Water District	40337	Completed
Rod Incerpi	40406	Completed
DPR Construction	40619	Completed
Cupertino Union School District	40500	Completed
The Nicholson Co.	40760	Completed
Los Altos Hills County Fire. Dist.	40760	Completed
Santa Clara County Fire Department	40737	Completed
Joe Tan	41024	Completed
Apple Inc.	NULL	Pending
Bob Todd	41215	Completed
Lennar Homes	41346	Completed
Classic Communities	41176	Completed
PREG Biltmore, LP	41367	Pending
Dan WHisenhunt/John Hillegass	41367	Pending

Table 2 From Cal Water: list of New Developments



SCVWD 2015 UWMP

LAS Developments & WSAs 2010 - 2015

Apple Campus 2
Hamptons Development
Vallco Mall redevelopment
2008 Sunnyview Ln, Mountain View, CA
1991 Sun Mor Ave, Mountain View, CA (Summerhill Homes) (13 homes)
Tract/Parcel 167-39-131
Tract/Parcel APN-336-13-045
420 Magdalena Ave, Los Altos, CA 94024
APN 331-11-006
APN 331-11-007
APN 331-07-070
APN 331-07-069
APN 331-11-102
1431 Arbor Ave, Los Altos, CA
1691 Witham Ave, Los Altos, CA
APN 336-12-004
APN 316-32-047
APN 316-32-048
APN 336-10-038
APN 211-50-025

Gilroy: Rick Smelser and Stan Ketchum. **4/5/2016**

Akel Engineering: Tony Akel

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?

   a. Current Draft of Gilroy's GP Update. Will undergo approval in 2016 or 2017.

2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions?

   a. The city believes their baseline numbers and their calculated growth rate are more realistic than ABAG. ABAG is low by the city's assessment.

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?

   a. There are no known plans that are pending or excluded or different than the GP Update. Also, the ABAG PDAs are in line with the city's.

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)

   a. None

Gilroy City Planning Staff Questions- Stan Ketchum

1. What developments are known or possible that are not clearly identified in the city's General Plan (GP), Housing Update (HU) or other appropriate PUBLISHED city planning documents?
   See 2015 GP Update Draft. No known other

2. Does the city's GP, HUs, or other planning consideration place a priority on following regional coordination growth plans such as ABAG and Plan Bay Area efforts, or otherwise find conflicts between city plans and external regional planning such as ABAG.
   No conflict with ABAG's PDAs

3. What developments are known or possible that are not clearly identified in ABAG's "2013 Bay Area Plan Projections"? (Such as Priority Development Areas (PDAs) page 100)
   None noted

4. Are there any known future shifts in high water use economies, such as cooling needs, industry, large irrigated turf, etc? Specifically in South County, changes in agricultural use or open space land use designations.

   None noted

5. Any known or anticipated large annexations or other considerations that would change the city boundaries or amendments to the urban service areas (USA) or spheres of influence (SOI), that would have the potential to change known or anticipated housing, population or growth projections?

   One area in north Gilroy was not approved by LAFCO and is currently being subject to objection by some members of the public. Council will hear that topic and perhaps extend the GP Update approval date to 2017. Nevertheless, since the GP population growth may remain unchanged in total number, the city is continuing to use the GP Update buildout housing numbers in the 2015 UWMP demand assessment

Appendix D – Water Demand and Agency Coordination

Great Oaks Water: Tim Guster **4/21/2016**

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?
    a. Used the previous growth rates and general direction of San Jose's Envision 2040. 2015 is the baseline water use year. Total population from ABAG projections were also utilized

2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions? =
    a. Not aware of any conflict specific to ABAG. But Envision 2040 overrode the previous Coyote Valley Specific Plan that was planned for potential Great Oaks service area.

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?
    a. No. But the general rate case research reviewed development in the next 5 years. Not aware of any new developments like seen recently in the Cottle Avenue area.

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)
    a. No. Most changes are likely to be towards higher water use efficiency. Not much change in the sector makeup (character of the service area); except likely more multifamily. Most growth will be small infill areas.

Morgan Hill: Dan Repp referred staff to Akel Engineering: Tony Akel, 4/20/2016

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?

   a. General Plan Update currently in progress. The GP update is documented at the following website: http://morganhill2035.org.

      Relevant planning documents can be found at the following page: http://morganhill2035.org/documents/project-documents/

2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions?

   a. The city believes their baseline numbers and their calculated growth rate are more realistic than ABAG. ABAG is low by the city's assessment.

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?

   a. There are no known plans that are pending or excluded or different than the GP Update. Also, the ABAG PDAs are in line with the city's.
   b. The Southeast Quadrant (SEQ) project is intended to preserve Agricultural Lands. More information on the SEQ can be found at the following link: http://www.morgan-hill.ca.gov/670/Southeast-Quadrant

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)

   None

City Planning Staff Questions

6. What developments are known or possible that are not clearly identified in the city's General Plan (GP), Housing Update (HU) or other appropriate PUBLISHED city planning documents?

   See General Plan. No known other

7. Does the city's GP, HUs, or other planning consideration place a priority on following regional coordination growth plans such as ABAG and Plan Bay Area efforts, or otherwise find conflicts between city plans and external regional planning such as ABAG.

   No conflict with ABAG's PDAs

8. What developments are known or possible that are not clearly identified in ABAG's "2013 Bay Area Plan Projections"? (Such as Priority Development Areas (PDAs) page 100)

   None noted

9. Are there any known future shifts in high water use economies, such as cooling needs, industry, large irrigated turf, etc? Specifically in South County, changes in agricultural use or open space land use designations.

   None noted

10. Any known or anticipated large annexations or other considerations that would change the city boundaries or amendments to the urban service areas (USA) or spheres of influence (SOI), that would have the potential to change known or anticipated housing, population or growth projections?

    Please see responses to item 1 and 2.

Mountain View: Elizabeth Flegel, Utility; Eric Anderson, Planning **3/28/2016**

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?
    a. Retailer staff has coordinated with city planning staff.
    b. The current demand projection numbers being developed for the 2015 UWMP considered the approved GP 2030 (adopted in 2012).
    c. The proposed developments known to the city that have not yet been approved, have been shared with retailer staff.
    d. Retailer staff will consider the estimated impact of those developments in a side discussion, and will state that they will need to go through a Water Supply Assessment once approved.
    e.
2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions? =
    a. Planning staff believe there is overall consistency between planning policy and Plan Bay Area. However, the job numbers from ABAG may be lower in some PDAs than already exists. However, even in these cases, the rate of growth appears to be consistent.
    b. Some PDAs being considered or proposed by the city, may have higher housing numbers than those shown in Plan Bay Area, but those housing numbers are consistent with the General Plan housing policies.
    c. Sent by email, not confirmed:
        i. Question for staff: So you did not specifically look at ABAG growth numbers? Even if you did not, do these seem way off from your analysis?

MV Plan Bay Area	2010	2015	2020	2025	2030	2035	2040
Total Population	74066	78000	82000	86100	90500	95200	100000
Households	31957	33570	35240	36830	38510	40130	41800
Total Jobs	47950	52040	56550	57940	59390	61440	63590

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?
    a. All PDA's in Plan Bay Are are already approved in GP, although some are being reviewed to consider additional growth (e.g., North Bayshore, East Whisman)

    b. All PDAs in Plan Bay Area were proposed by the city. However, future ABAG projections may need to be aligned with the GP amendments
    c. PDAs in Plan Bay Area: Whisman Station, Downtown (approved but residents don't want that much change/growth downtown); San Antonio, El Camino Real Corridor; North Bayshore

   d. All approved growth was used in the demand projections, and studied growth was used for a parallel analysis also summarized in the UWMP

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)
   a. Retailer staff does not see any significant supply side issues with the information as it known now, but increased recycled water use will likely be part of the demand growth in some areas in the current RW service area (North Bayshore). In fact, there already exists a city code from 2004 which requires use of RW for irrigation in that service area and some new developments may be asked to consider dual plumbing.

Appendix D – Water Demand and Agency Coordination

City of Palo Alto: Karla Daily **4/28/2016**

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?

   a. ABAG Plan Bay Area Projections 2013 (population)
   b. City adopted Comprehensive Plan and Housing Elements
   c. Regular discussions with city planning staff

2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions?

   a. No

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?

   a. ABAG lists Palo Alto California Avenue as a PDA. Not sure if it is specifically covered in the Comprehensive Plan or Housing Element, but ABAG was used in the demand basis.

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)

   a. None. However, water use has been declining even with increases in population. In addition, increases in water use efficiency are expected. So as a result, overall demand is projected to decline by the end of the planning horizon.

City Planning Staff Questions (answered through Karla Daily)

11. What developments are known or possible that are not clearly identified in the city's General Plan (GP), Housing Update (HU) or other appropriate PUBLISHED city planning documents?

    NO

12. Does the city's GP, HUs, or other planning consideration place a priority on following regional coordination growth plans such as ABAG and Plan Bay Area efforts, or otherwise find conflicts between city plans and external regional planning such as ABAG.

    NO

13. What developments are known or possible that are not clearly identified in ABAG's "2013 Bay Area Plan Projections"? (Such as Priority Development Areas (PDAs) page 100)

    NO

14. Are there any known future shifts in high water use economies, such as cooling needs, industry, large irrigated turf, etc? Specifically in South County, changes in agricultural use or open space land use designations.

    NO

15. Any known or anticipated large annexations or other considerations that would change the city boundaries or amendments to the urban service areas (USA) or spheres of influence (SOI), that would have the potential to change known or anticipated housing, population or growth projections?

    NO

Purissima Hills Water District: Patrick Walter. **4/5/2016**

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?
    a. PHWD collaborated with BAWSCA on demand development and the underlying assumptions and are documented in the BAWSCA study report. The demands are projected as flat from 2020 to 2040 (lower than 2013 but higher than 2015). PHWD noted that the reason for the BAWSCA future demand to be higher than 2013 water use may be attributed to:
        i. 2013 was a dry/drought year with no water use restrictions or call for reductions in place and therefore use was higher than normal, and
        ii. It will take a little while for the drought restriction water use behavior to rebound to more normal levels.
    b. PHWD added that even if some growth does occur, it would likely be countered by future water use efficiency improvements or behavioral changes, continued rate increases or new water use policies/targets.

2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions? =
    a. PHWD understanding of available growth in the housing and job sector does not match the analysis conducted by District staff's analysis of ABAG projected growth. The District's analysis included the use of Census Tract level of ABAG data, which may not exactly match PHWD service area boundaries. In addition, PHWD does not see much room in growth. For residential SF growth, the service area is essentially built out. The majority of new growth in population would be predominately under residential housing unit teardown and rebuilds where the person per household could increase. Excess or open acreage cannot be easily calculated for growth potential due to yield of buildable lots for a given parcel due to the sloping nature of most properties in the service area's hillside developments. As for job growth, there is little employment sector in the service area, predominantly churches and Foothill College and a county club.

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?
    a. No room for new developments. No PDAs.

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)
    a. No major large sector changes. However, the service area has a large residential outdoor irrigation use sector. Also, PHWD believes that water rate increases may have an effect on some water use behavior.

San Jose Municipal Water: Nicole Harvey – via e-mail **3/30/2016**

San Jose Municipal water demand projections are based on the planned growth identified in the San Jose 2040 General Plan. The SJGP includes detailed information down to the parcel level for planned zoning and development use, so those are utilized to project demands. We will include known proposed high-users, but at this time there are very few and we generally assume growth as identified in the SJGP. Consideration is also made for locations that are developed but currently vacant (an example of that is the Edenvale area that has a good amount of vacant commercial buildings). Because our service area boundary doesn't overlap with agency information available for miscellaneous planning needs (Dept of Finance, ABAG, etc.), it's too difficult for us to utilize those.

Appendix D – Water Demand and Agency Coordination

San Jose Water Company: Jake Walsh, Bill Tuttle. **4/7/2016**

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?

    a. SJWC used ABAG Plan Bay Area 2013 growth by Census Block to determine residential growth rates within their service area boundary. SJWC uses population growth and per capita demand for water demand projections.

2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions?

    a. SCVWD staff analysis of ABAG to Envision San Jose residential growth appears within the same approximate range. Envision SJ jobs projection of 470,000 new jobs is higher than SJWC service area. But San Jose is also served by SJ Municipal Water. SCVWD will continue review of general plan documents. Analysis so far, shows relatively good correlation in the residential growth sector.
    b. SJWC staff believe that due to the large water service area, that the ABAG growth rate is likely inclusive of land use planning projections by the individual cities in its service area and within its supply availability. SJWC's underlying assumption in using ABAG is that ABAG incorporated approved General Plan growth projections.
    c. SJWC also believes its demands are conservative. Also, its service area is essentially built out and that most new developments are tear down/rebuilds. And that most new development would have a lower irrigation demand than existing land uses.

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?

    a. SJWC's underlying assumption in using ABAG is that ABAG incorporated approved General Plan growth projections.

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)

    a. Recycled Water Demand is going up.

Appendix D – Water Demand and Agency Coordination

Sunnyvale: Mansour Nasser, Utility; and Amber Blizinski (via email), Planning **4/20/2016**

1. What documented growth assumptions (e.g., ABAG projections, General Plans, other) were included in your UWMP water demand assumptions?
    a. Base year used Department of Finance statistics.
    b. Projections are based loosely on the Sunnyvale General Plan Land Use and Transportation Element (LUTE). The LUTE is being updated
    c. A Water Supply Assessment was prepared for the Draft LUTE

2. Do the city plans or demand assumptions conflict with, or have major deviations with, Plan Bay Area projections and assumptions? =
    a. City plans may conflict with currently proposed (but not yet adopted) ABAG projections. ABAG under projects jobs when compared to the LUTE. Also, ABAG projects the location of the majority of jobs to be in the PDAs, but the LUTE places them in the Peery Park and other locations. Similarly, the location of housing growth differs in the two documents, while the total growth is similar.

3. Do you have a list of developments that are specifically included or excluded from the demand assumptions, including Priority Development Areas (PDAs) in ABAG Plan Bay Area 2013? And for those included, are they considered in approved planning documents such as General Plans?
    a. Peery Park as proposed by Sunnyvale to become a PDA, is not included in ABAG's PDA.
    b. Also, the ABAG calculations may not encompass the updated Lawrence Station, Peery Park, El Camino Precise Plan or Village Centers.

4. What major or significant changes have happened or expected within certain water use sectors? (for example, recent relocation or changes in: major industries, large public facilities, cooling centers, large irrigated turf, etc.)
    a. Major changes in the amount of industrial and large scale office complexes are expected in Peery Park, Lawrence Station Area and certain Industrial to Residential sites, notably East Sunnyvale Plan area. Now that at the Spansion site (manufacturing) site is not longer operating, there is less water use there.

Appendix D – Water Demand and Agency Coordination

City of San Jose Planning Document: Envision San Jose 2040

The Envision San José 2040 General Plan supports significant amounts of planned job and housing growth capacity. Based upon the land uses designated on the General Plan Land Use/Transportation Diagram and accompanying policies contained within the text of General Plan document, the General Plan is intended to support the addition of **470,000 new jobs and 120,000 new housing units** within San José. Much of this growth capacity is planned for specifically identified Growth Areas which have a high degree of access to transit and/or other infrastructure, proximity to retail and other services and strategic locations which support surrounding neighborhoods. These Growth Areas are also planned to develop at higher densities and with a mix of land uses in order to foster walking, bicycle and transit use and the formation of community identity.

City of Campbell General Plan 2001

http://www.cityofcampbell.com/DocumentCenter/View/2664

LUT Overview

The proposed 2001 General Plan at buildout would accommodate a population level of approximately 41,825, or 9.7 percent over 2000 levels, as shown in Table LUT-1: Historic and Projected Population. This population increase would be generated from the potential increase of 1,600 housing units, concentrated mainly on mixed-use redevelopment sites along light rail transit corridors and infill development.

Historic and Projected Population

	1980	1990	2000	2020
Pop	26,910	36,048	38,138	41,946

The inventory identifies the potential for 1,161 additional units based upon the existing General Plan and Zoning Designations. Of these units, 1,008 result from the development of properties that allow residential densities in excess of 20 units per acre and are potentially affordable for all income categories. A summary of the Opportunity Site Areas is :

- Bascom Avenue Corridor= 5.0 Acres/ 109 Units
- East Campbell Avenue Master Plan = 5.2 Acres/ 116 Units
- SOCA Area Plan 19.8 Acres/ 419 Units
- Winchester Blvd Master Plan –South 17.3 Acres/ 350 units
- Dot Avenue Properties 2.1 Acres/ 31 units

All referenced Area Plans and Special Project Areas in 2001 GP

- Pruneyard/Creekside Commercial District LUT-33
- North of Campbell Avenue (NOCA)... LUT-34
- South of Campbell Avenue (SOCA)... LUT-34
- San Tomas Area Neighborhood Plan (STANP) LUT-34
- Campbell Redevelopment Area LUT-35
- Downtown.. LUT-35
- Downtown Neighborhoods.............................

LINKS

- Downtown Development Plan (no population est)
- East Campbell Avenue Master Plan (not residential focus)
- Winchester Boulevard Master Plan
- South of Campbell Avenue (SOCA) Plan (policy)

- North of Campbell Avenue (NOCA) Plan (policy)
- San Tomas Area Neighborhood Plan (framework and policy)

Priority Development Area In 2007, the City established a Priority Development Area (PDA) under the regional planning initiative called FOCUS implemented by the Association of Bay Area Governments (ABAG). FOCUS is intended to further the development of self sustaining communities by bringing housing closer to public transit and services in order to reduce automobile traffic resulting in lower greenhouse gas emissions and improved air quality. The City identified the **Central Campbell Redevelopment Project Area as a PDA** that includes the area in and around the downtown. This area is planned for higher density residential and mixed use development in proximity to public transportation and services and will be the focus for the City's higher density development.

Campbell Website – 395 units listed below

http://www.cityofcampbell.com/498/Development-Activity

CURRENT PROJECTS

Cottage Place
Address: 45-81 Kennedy Avenue
Location: North side of Kennedy Avenue between South Winchester Boulevard and Industrial Avenue.
Description: Planned development permit for **18 residences** (mixture of attached and detached units).
Status: Under construction.

Riverside
Address: 651, 655, & 671 West Hamilton Avenue
Location: West Hamilton Avenue east of San Tomas Expressway and west of Darryl Drive.
Description: Planned Development Permit and a Tentative Vesting Subdivision Map for construction of a mixed-use development consisting of **43 apartment units and 65 townhome units.**
Status: Under construction nearing completion; model units available for touring mid-February 2015.

25 South San Tomas Aquino Road
Location: Northwest corner of South San Tomas Aquino Road and Bucknall Road, south of West Campbell Avenue.
Description: Zone Change, General Plan Amendment, Planned Development Permit, and Tentative Vesting Subdivision Map for a **25-unit small-lot single-family subdivision**.
Status: Building permits issued; completion estimated Fall 2015

PROJECTS UNDER BUILDING PERMIT PLAN CHECK

675 & 705 Creekside Way
Location: Creekside Way, south of Hamilton Avenue.
Description: Planned Development Permit for a **170,000 square foot office building** and two multi-level parking structures, and a separate **10,125 square foot office building**.

Status: Approved by City Council on September 15, 2015.

256/269 Union Avenue
Location: Union Avenue, south of Apricot Avenue.
Description: Planned Development Permit, Zone Change, and Tentative Subdivision Map for a **five-unit townhom**e development.
Status: Building permit issued; completion estimated Winter 2015

RECENTLY APPROVED PROJECTS

300 Railway Avenue
Location: Located along the east side of Railway Avenue, south of Gilman, and west of Highway 17; adjacent to the Avalon Apartment Community and City Corporation Yard.
Description: Planned Development Permit for **119 apartments, 32 townhomes, and 6 duet units**.
Status: City Council approved on City Council October 6, 2015.

Dillon Avenue Project
Location: Southeast corner of Sam Cava and Dillon Avenue.
Description: Planned Development Permit to allow the construction of **81 townhomes and 19 apartments.**
Status: Approved; building permits not yet submitted.

Dell Avenue Area Plan
The Dell Avenue Area Plan (DAAP) covers approximately 112 acres encompassing industrial and commercial properties south of Hacienda Avenue, located along Dell Avenue and Winchester Boulevard.

NEW General Plan
The City of Campbell is embarking on an update—Envision Campbell—to its General Plan. As required by State law, the updated General Plan will take a comprehensive, long-term view to direct future growth of City over the next 25 years. Envision Campbell is still in its initial stages and a timeline has not yet been prepared.

ABAG

Total Population		Campbell	Subregional Study Area					
	2010	2013	2015	2020	2025	2030	2035	2040
CAMPBELL**	67	40,100	40,600	41,900	43,300	44,800	46,400	48,100

PDA Campbell Central Redevelopment Area
Pop 2010 = 2600
Pop 2040 = 5850

City of Campbell Staff E-mail response Naz Pouya | Project Planner May 25, 2016

City Planning Staff Questions

1. What developments are known or possible that are not clearly identified in the city's General Plan (GP), Housing Update (HU) or other appropriate PUBLISHED city planning documents?

- Our Development Activity web page lists projects that are under construction or recently completed: http://www.cityofcampbell.com/498/Development-Activity

2. Does the city's GP, HUs, or other planning consideration place a priority on following regional coordination growth plans such as ABAG and Plan Bay Area efforts, or otherwise find conflicts between city plans and external regional planning such as ABAG.

- Yes, as part of CEQA analysis and the Housing Element of the General Plan

3. What developments are known or possible that are not clearly identified in ABAG's "2013 Bay Area Plan Projections"? (Such as Priority Development Areas (PDAs) page 100)

- Our Development Activity web page lists projects that are under construction or recently completed: http://www.cityofcampbell.com/498/Development-Activity

4. Are there any known future shifts in high water use economies, such as cooling needs, industry, large irrigated turf, etc? Specifically in South County, changes in agricultural use or open space land use designations.

- No

5. Any known or anticipated large annexations or other considerations that would change the city boundaries or amendments to the urban service areas (USA) or spheres of influence (SOI), that would have the potential to change known or anticipated housing, population or growth projections?

- No

Appendix D – Water Demand and Agency Coordination

City of Cupertino General Plan 2015 -2040

Long-term Projections Table HE-2 on page HE-7 shows population, household, and job growth projections for Cupertino, Santa Clara County, and the nine-county Bay Area region between 2010 and 2040 and represents the analysis conducted by the Association of Bay Area Governments (ABAG) using 2010 Census data and a variety of local sources. Between 2010 and 2040, Cupertino's population is expected to grow by 12,898 residents—from 58,302 to 71,200. This translates into an increase of 22 percent over 30 years.

TABLE HE-2: POPULATION, HOUSEHOLD, AND JOB PROJECTIONS, 2010-2040 matches ABAG Plan Bay Area 2013.

Distribution of Units by Structure: Type A majority of housing units in Cupertino are singlefamily detached homes (57 percent in 2013). While still representing the majority house type, this represents a decrease from 2000, when 61 percent of all homes were single-family detached. In comparison, single-family detached homes in both Santa Clara County and the Bay Area comprised 54 percent of all homes in 2013. Large multi-family buildings (defined as units in structures containing five or more dwellings) represent the second argest housing category in Cupertino (21 percent), followed by single-family attached dwellings (12 percent). Between 2000 and 2013, these two housing types experienced an increase of 24 and 26 percent, respectively.

Available residential development opportunity sites to meet and exceed the identified regional housing need pursuant to the RHNA. The opportunity sites can accommodate infill development of up to **1,400** residential units on properties zoned for densities of 20 dwelling units to the acre or more. The potential sites inventory is organized by geographic area and in particular, by mixed use corridors. As shown in Table HE-5, sites identified to meet the near-term development potential lie within the North Vallco Park Special Area, the Heart of the City Special Area, and the Vallco Shopping District Special Area.

PRIORITY HOUSING ELEMENT SITES TO MEET THE RHNA - SCENARIO A (none of the following are in ABAG PDA list)

- Site A1 (The Hamptons) High Density **600** net
- Site A2 (Vallco Shopping District) RS/O/R P(Regional Shopping) & P(CG) Vallco Shopping District **389** units *OR (“Scenario B” of sites strategy **1,064** units)*
- Site A3 (The Oaks Shopping Center) C/R P(CG, Res) **200** units
- Site A4 (Marina Plaza) C/O/R P(CG, Res) **200** units
- Site A5 (Barry Swenson) C/O/R P(CG, Res) **11** units

ABAG Plan Bay Area PDA

- Cupertino VTA city Cores, Corridors and Station Areas ad **2450 new HH or 6810 people**

Appendix D – Water Demand and Agency Coordination

City of Monte Sereno General Plan 2008 and HE 2014

http://www.montesereno.org/DocumentCenter/Home/View/1397

GP Review

Monte Sereno is a largely built-out community with a limited supply of vacant land. Additionally, many of the remaining vacant sites within the city boundary are located on unstable, steep slopes and are not ideal for development. This General Plan therefore anticipates limited additional development in Monte Sereno over the next 15 years. New development in Monte Sereno during this period is expected to consist of redevelopment of single-family homes, new secondary dwelling units and multi-family housing. As discussed further in the Housing Element, the Association of Bay Area Governments (ABAG) projects that new development will accommodate approximately **150 additional households in Monte Sereno by 2035**. No additional non-residential development is anticipated during this planning period. (District staff reviewed 2013 ABAG, **80 new HH** from 2015 to 2040)

Potential Annexation Areas Monte Sereno's Sphere of Influence (SOI) contains areas that the city may annex during the planning period of this General Plan. The Santa Clara Local Area Formation Commission (LAFCo) has identified the following three areas (or "pockets") in the SOI as land most appropriate for annexation into Monte Sereno: ♦ Pocket #1, Karl Avenue, 9 acres ♦ Pocket #2, Highway 9, 125 acres ♦ Pocket #3, Upper Hillside, 68 acres The location of these three annexation pockets is identified in Figure LU-1. Annexation of these pockets or any other areas within the City's SOI requires approval of both the Monte Sereno City Council and the Santa Clara LAFCo. Within Annexation Pocket #2 is the La Hacienda Inn, located on Saratoga-Los Gatos Road at Austin Way. The La Hacienda Inn, containing 20 guest rooms, a restaurant and a bar, is a non-conforming use as it is located in a County zone that permits only low-density residential uses.

HE Review

107 new unit potential as follow:

- Site Inventory (Underdeveloped Land) There are 5 parcels of underdeveloped land identified within the City limits = Units up to **33**
- First Baptist Church Site Proposed Guidelines for Public/Residential Multi Family Zone: max units **15**
- La Hacienda restaurant. In 2013 the City prezoned a 4.45 acre site in the City's Sphere of Influence. The site is the location of the and is located at 18840 Saratoga Los Gatos Road. Max Units: **13**
- Second Unit additions: The City estimates that an average of six Second Units will be built annually during the 8 year time frame of this Housing Element, resulting in **46** new Second Units

Appendix D – Water Demand and Agency Coordination

City of Saratoga – Planning Department Review

General Plan 1983

Housing Element Update November 2014

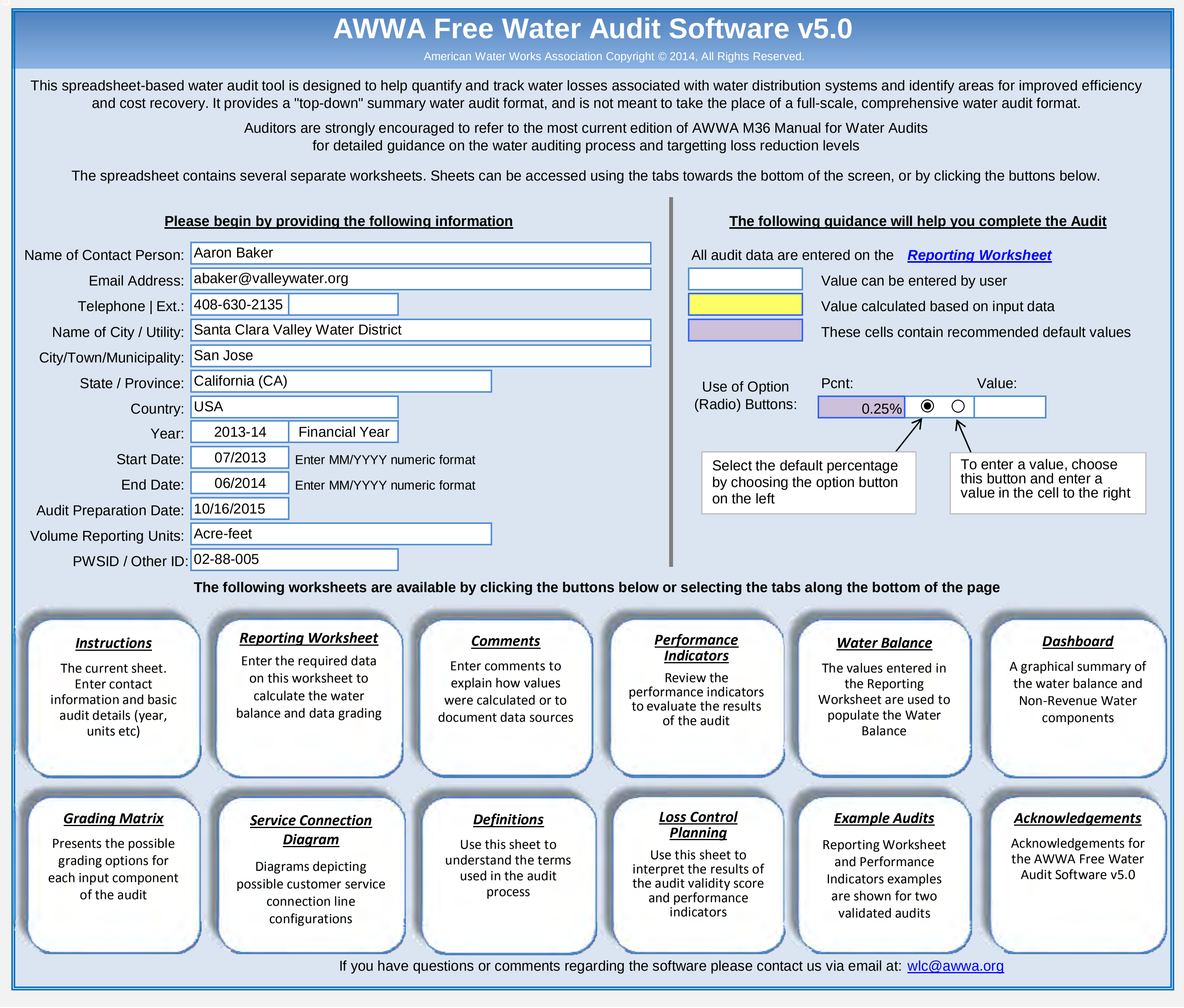
http://www.saratoga.ca.us/civicax/filebank/blobdload.aspx?BlobID=3497

- Population projection through 2040 supplied by ABAG. Figure 2.1, 32,700 people by 2040. This is consistent with ABAG Plan Bay Area Projections 2013 (**population increase of 1900** from 2015 to 2040).
- Approximately 5% growth from 2015 to 2040. Or, **570 additional HH**
- Job projections also supplied by ABAG Plan Bay Area Projections 2013
- Housing characteristic is 91% SFR

There are no recent specific plans on the website

ABAB Plan Bay Area has not listed any Priority Development Areas in Saratoga

Water Loss Audit



AWWA Free Water Audit Software v5.0

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person: Aaron Baker
Email Address: abaker@valleywater.org
Telephone | Ext.: 408-630-2135
Name of City / Utility: Santa Clara Valley Water District
City/Town/Municipality: San Jose
State / Province: California (CA)
Country: USA
Year: 2013-14 Financial Year
Start Date: 07/2013 Enter MM/YYYY numeric format
End Date: 06/2014 Enter MM/YYYY numeric format
Audit Preparation Date: 10/16/2015
Volume Reporting Units: Acre-feet
PWSID / Other ID: 02-88-005

The following guidance will help you complete the Audit

All audit data are entered on the ***Reporting Worksheet***

☐	Value can be entered by user
🟨	Value calculated based on input data
🟪	These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% ● ○ Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions
The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet
Enter the required data on this worksheet to calculate the water balance and data grading

Comments
Enter comments to explain how values were calculated or to document data sources

Performance Indicators
Review the performance indicators to evaluate the results of the audit

Water Balance
The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard
A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix
Presents the possible grading options for each input component of the audit

Service Connection Diagram
Diagrams depicting possible customer service connection line configurations

Definitions
Use this sheet to understand the terms used in the audit process

Loss Control Planning
Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits
Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements
Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
+ Click to add a comment

Water Audit Report for: Santa Clara Valley Water District (02-88-005)
Reporting Year: 2013-14 | 7/2013 - 6/2014

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

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

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

Master Meter and Supply Error Adjustments

WATER SUPPLIED

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

									Pcnt:		Value:	
Volume from own sources:	+	?	7	116,037.000	acre-ft/yr	+	?	7	1.75%	● ○		acre-ft/yr
Water imported:	+	?	8	530.000	acre-ft/yr	+	?	5	-1.00%	● ○		acre-ft/yr
Water exported:	+	?	8	750.000	acre-ft/yr	+	?	5	-1.00%	● ○		acre-ft/yr

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

WATER SUPPLIED: **113,819.055** acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

						Pcnt:		Value:	
Billed metered:	+	?	8	111,366.71	acre-ft/yr				
Billed unmetered:	+	?	n/a	0.000	acre-ft/yr				
Unbilled metered:	+	?	n/a	0.000	acre-ft/yr				
Unbilled unmetered:	+	?	7	7.000	acre-ft/yr		○ ●	7.000	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: ? **111,373.710** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) **2,445.345** acre-ft/yr

Apparent Losses

						Pcnt:		Value:	
Unauthorized consumption:	+	?	7	1.000	acre-ft/yr		○ ●	1.000	acre-ft/yr
Customer metering inaccuracies:	+	?	7	2,272.790	acre-ft/yr	2.00%	● ○		acre-ft/yr
Systematic data handling errors:	+	?	7	1.000	acre-ft/yr		○ ●	1.000	acre-ft/yr

Apparent Losses: ? **2,274.790** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)
Real Losses = Water Losses - Apparent Losses: ? **170.555** acre-ft/yr

WATER LOSSES: **2,445.345** acre-ft/yr

NON-REVENUE WATER
NON-REVENUE WATER: ? **2,452.345** acre-ft/yr
= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	7	39.9	miles
Number of active AND inactive service connections:	+	?	7	28	
Service connection density:		?		1	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes
Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)
Average length of customer service line has been set to zero and a data grading score of 10 has been applied
Average operating pressure: + ? 7 85.0 psi

COST DATA

Total annual cost of operating water system:	+	?	7	$124,400,000	$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	8	$2.39	$/1000 gallons (US)
Variable production cost (applied to Real Losses):	+	?	7	$48.80	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

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

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

PRIORITY AREAS FOR ATTENTION:

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

1: Volume from own sources
2: Customer metering inaccuracies
3: Total annual cost of operating water system

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

Water Audit Report for: Santa Clara Valley Water District (02-88-005)
Reporting Year: 2013-14 | 7/2013 - 6/2014

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

System Attributes:

	Apparent Losses:	2,274.790	acre-ft/yr
+	Real Losses:	170.555	acre-ft/yr
=	Water Losses:	2,445.345	acre-ft/yr
?	Unavoidable Annual Real Losses (UARL):	See limits in definition	acre-ft/yr
	Annual cost of Apparent Losses:	$1,771,572	
	Annual cost of Real Losses:	$8,323	Valued at Variable Production Cost Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	2.2%	
	Non-revenue water as percent by cost of operating system:	1.4%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	72528.63	gallons/connection/day
	Real Losses per service connection per day:	N/A	gallons/connection/day
	Real Losses per length of main per day*:	3,816.09	gallons/mile/day
	Real Losses per service connection per day per psi pressure:	N/A	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	170.56	acre-feet/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:		

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

AWWA Free Water Audit Software:
User Comments

WAS v5.0

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

General Comment:	

Audit Item	Comment
Volume from own sources:	Own sources represent water produced in the water treatment plants.
Vol. from own sources: Master meter error adjustment:	
Water imported:	Water imported represents water received by SCVWD from the SFPUC intertie.
Water imported: master meter error adjustment:	One electronic meter
Water exported:	Water exported represents water sent to SFPUC through the intertie.
Water exported: master meter error adjustment:	One electronic meter
Billed metered:	Billed metered is the amount billed. All treated water customers are metered.
Billed unmetered:	No billed unmetered customers.
Unbilled metered:	No unbilled metered customers.

Audit Item	Comment
Unbilled unmetered:	Transmission line repair, maintenance, and disinfection discharges.
Unauthorized consumption:	Distribution system consists of wholesale transmission mains with very few opportunities for unauthorized consumption.
Customer metering inaccuracies:	24 large diameter meters - 12" and above.
Systematic data handling errors:	Only 26 meters billed to 13 customers. Audits perfomed.
Length of mains:	
Number of active AND inactive service connections:	
Average length of customer service line:	
Average operating pressure:	
Total annual cost of operating water system:	$124M is based on cost of service used to derive water charges less costs related to recycled water and advanced purification.
Customer retail unit cost (applied to Apparent Losses):	The treated water charge for contract treated water in FY 14 was $780/AF which converts to $2.39 per 1000 gallons
Variable production cost (applied to Real Losses):	

AWWA Free Water Audit Software: Water Balance

WAS v5.0

Water Audit Report for:	Santa Clara Valley Water District (02-88-005)	
Reporting Year:	2013-14	7/2013 - 6/2014
Data Validity Score:	72	

Own Sources (Adjusted for known errors) *114,041.278*	System Input *114,576.631*	Water Exported *757.576*	Billed Water Exported			Revenue Water 757.576
		Water Supplied *113,819.055*	Authorized Consumption *111,373.710*	Billed Authorized Consumption *111,366.710*	Billed Metered Consumption (water exported is removed) *111,366.710*	Revenue Water 111,366.710
					Billed Unmetered Consumption *0.000*	
				Unbilled Authorized Consumption *7.000*	Unbilled Metered Consumption *0.000*	Non-Revenue Water (NRW) 2,452.345
					Unbilled Unmetered Consumption *7.000*	
			Water Losses *2,445.345*	Apparent Losses *2,274.790*	Unauthorized Consumption *1.000*	
					Customer Metering Inaccuracies *2,272.790*	
					Systematic Data Handling Errors *1.000*	
Water Imported *535.354*				Real Losses *170.555*	Leakage on Transmission and/or Distribution Mains *Not broken down*	
					Leakage and Overflows at Utility's Storage Tanks *Not broken down*	
					Leakage on Service Connections *Not broken down*	

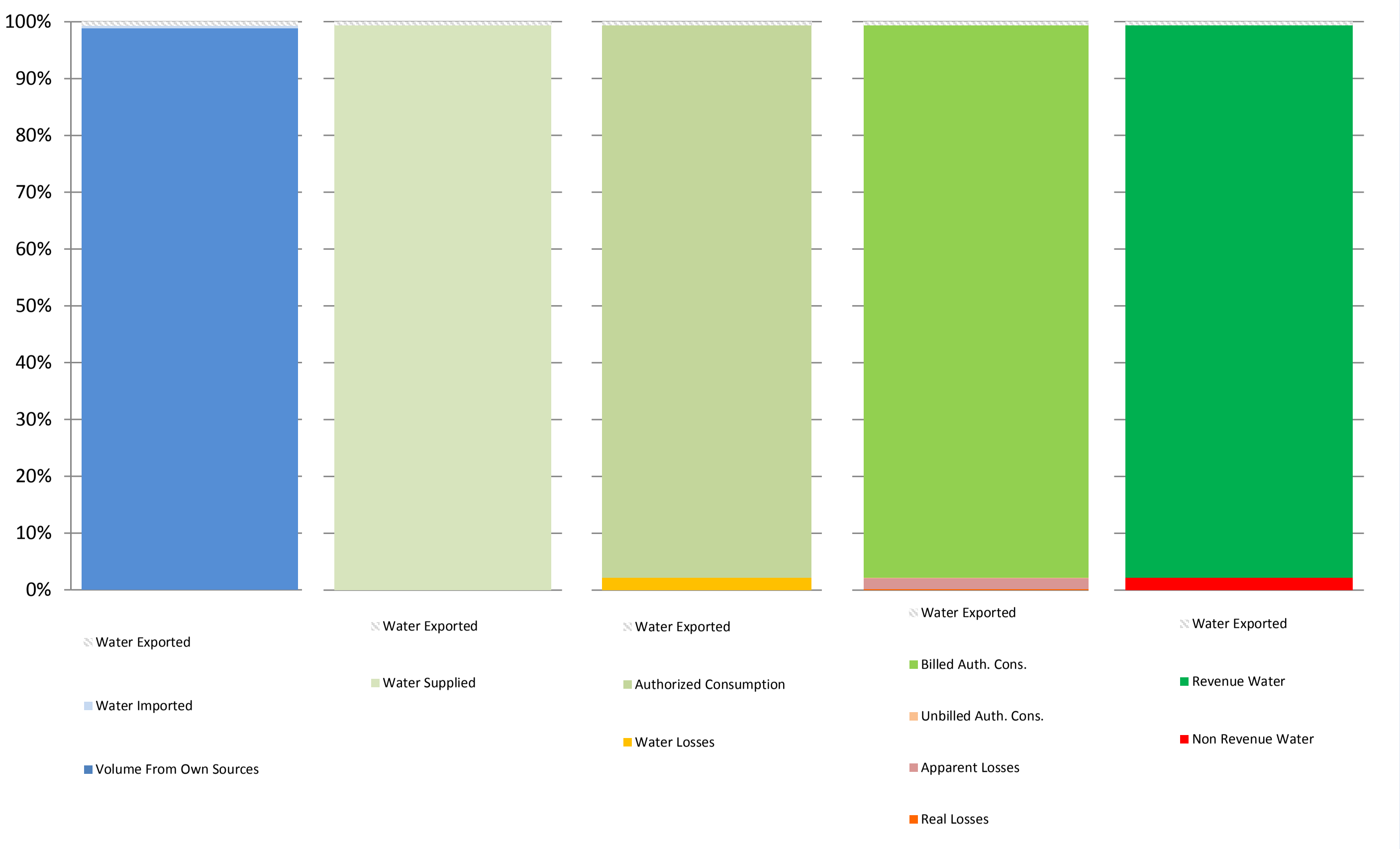
AWWA Free Water Audit Software:
Dashboard

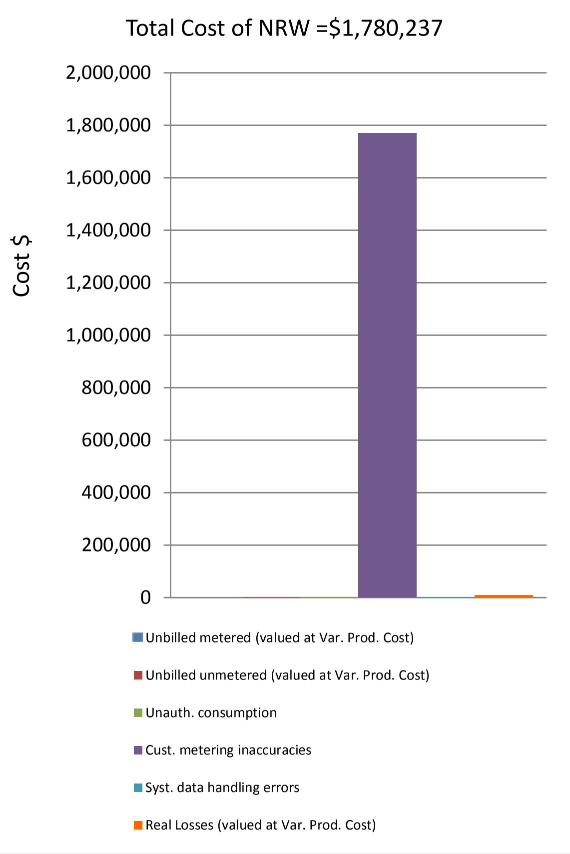
WAS v5.0

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

Water Audit Report for:	Santa Clara Valley Water District (02-88-005)	
Reporting Year:	2013-14	7/2013 - 6/2014
Data Validity Score:	72	

○ Show me the VOLUME of Non-Revenue Water
● Show me the COST of Non-Revenue Water




Total Cost of NRW =$1,780,237

Water Supply and Infrastructure Master Plan

Appendix F

OCTOBER 2012

2012 Water Supply and Infrastructure Master Plan

Santa Clara Valley
Water District

Santa Clara Valley Water District
2012 Water Supply and
Infrastructure Master Plan

Prepared by:
Tracy Hemmeter, Senior Project Manager
Erin Baker, Senior Engineer

Under the Direction of:

Debra Caldon, Water Resources Planning Unit Manager
Frank Maitski, Deputy Operating Officer
Jim Fiedler, Chief Operating Officer
Beau Goldie, Chief Executive Officer

October 2012

Acknowledgments

Stakeholder Review Committee

Building Industry Association of the Bay Area – Crisand Giles
City of Milpitas – Fernando Bravo, Howard Salamanca
City of Morgan Hill – Tony Eulo, Jimmy Forbis
City of Palo Alto - Nico Procos
City of Santa Clara – Chris DeGroot
City of Sunnyvale – Mansour Nasser
Farm Bureau of Santa Clara County - Jennifer Williams
League of Women Voters – Sue Graham, Karen Sundback
San Francisco Public Utilities Commission – Molly Petrick
San Jose Water Company – George Belhumeur
Santa Clara Basin Watershed Management Initiative – Trish Mulvey
Santa Clara Valley Audubon Society – Shani Kleinhaus
Silicon Valley Leadership Group – Sai Amath
United Neighborhoods of Santa Clara County – Ken Kelly

Water Supply and Infrastructure Master Plan Summary

A reliable supply of clean water is necessary for the social, economic, and environmental well-being of Santa Clara County. This is reflected in the Santa Clara Valley Water District (District) Act that states one of the purposes of the District is “to do any and every lawful act necessary to be done that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants within the District.” Furthermore, Board Policy states that “there is a reliable, clean water supply for current and future generations.”

Additional water supply investments will be needed in the future to meet the county’s water needs. The Water Supply and Infrastructure Master Plan (Water Master Plan) presents the Santa Clara Valley Water District’s strategy for meeting those future needs. The activities and projects to carry out this strategy have to be funded or committed to by the District, and may be influenced by other factors beyond the scope of this Water Master Plan. However, the Water Master Plan does provide a water supply strategy for planning these activities and projects, and provides a roadmap for future District investments in water supply reliability.

The District’s Ensure Sustainability water supply strategy has three key elements: 1) secure existing supplies and infrastructure, 2) optimize the use of existing supplies and infrastructure, and 3) increase recycling and conservation. The District must secure existing supplies and facilities for future generations because they are, and will continue to be, the foundation of our water supply system. In addition, the District has opportunities to make more effective use of its existing assets. Finally, the District is committed to working with the community to meet Silicon Valley’s future increases in water demand through conservation and recycling.

The Water Master Plan is the District’s strategy for providing a reliable and sustainable future water supply for Santa Clara County and ensuring new water supply investments are effective and efficient.

The Water Master Plan strategy is phased to ensure timely, appropriate investment decisions. Over the next five years, the District will continue work on securing and restoring existing supplies and infrastructure, and begin foundational work on developing future supplies. This foundational work includes participating in regional recycled water strategic planning, conducting public outreach on indirect potable reuse (IPR), identifying additional testing or demonstration activities that would be required to proceed with IPR, developing groundwater protection guidelines for graywater reuse, developing partnership agreements for dry-year water options, and participating in the development of regulations and policies. These activities are critical to successful project implementation, and once completed, the District can begin project-specific planning, design, and construction of new facilities.

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Table of Contents

Figures

Tables

1

WATER MASTER PLAN 2012

A Reliable Water Supply is Important to the Community

A reliable supply of clean water is necessary for the environmental, economic, and social well-being of Santa Clara County. A safe and reliable water supply extends beyond the significant social requirements of basic health and sanitation. This extension includes economic vitality, environmental needs, agricultural requirements, social benefits, cultural expectations and requirements, and quality of life enhancements. On behalf of the community, the Santa Clara Valley Water District (District) has made significant investments to develop water supplies and infrastructure to meet the county's water needs. The Water Supply and Infrastructure Master Plan (Water Master Plan) identifies the District's strategy to continue investments to meet the county's future water supply needs through at least 2035.

> ***"Water is one of the Region's most precious resources, serving a multitude of needs… Sustainability in the long run requires that households, workplaces, and agricultural operations efficiently use and reuse water."***
> ***– Silicon Valley Index 2012***

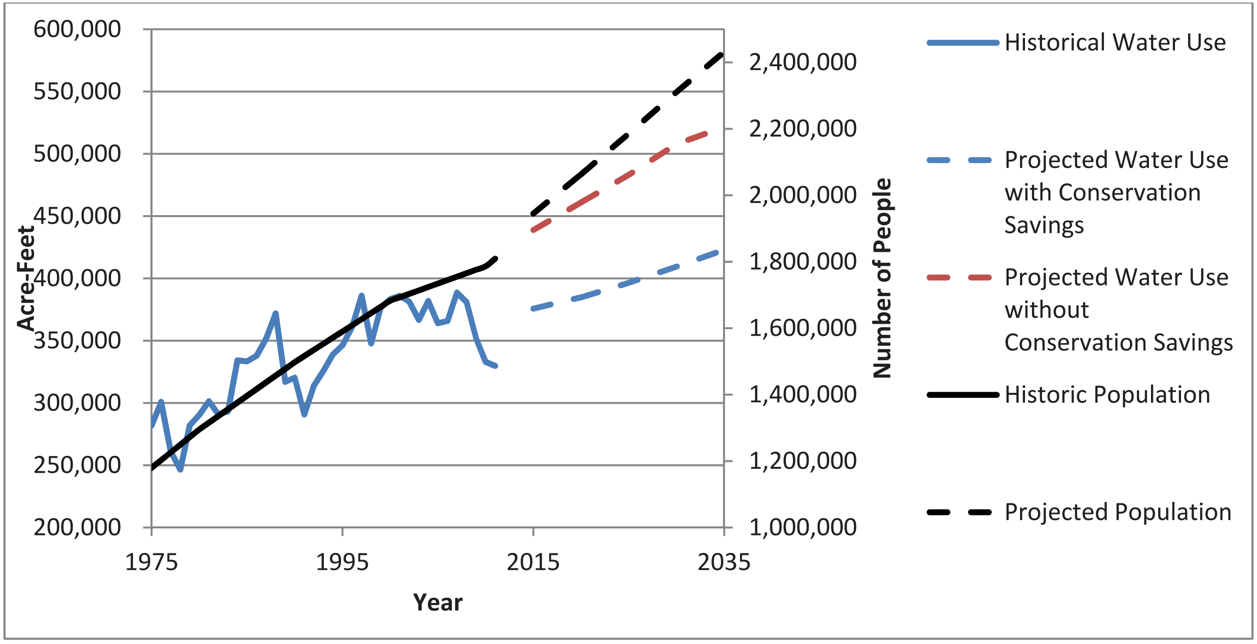
Santa Clara County Will Need More Water in the Future

The Association of Bay Area Governments projects that the county's population will increase from about 1.8 million in 2010 to about 2.4 million by 2035 (Association of Bay Area Governments, 2009). Jobs are projected to increase from about 0.9 million in 2010 to about 1.4 million in 2035. Even though per capita water use continues to decline, the District estimates that increases in population and jobs will result in an increase in water demands from about 329,000 AF in 2010 to about 423,000 AF by 2035 (District, 2010).

Most of the increase in water demands will occur in northern Santa Clara County. In southern Santa Clara County, where about half of all water use is for agriculture, overall water demands will stay about the same through 2035. Urban water use is expected to increase, but agricultural water use is expected to decrease by a like amount.

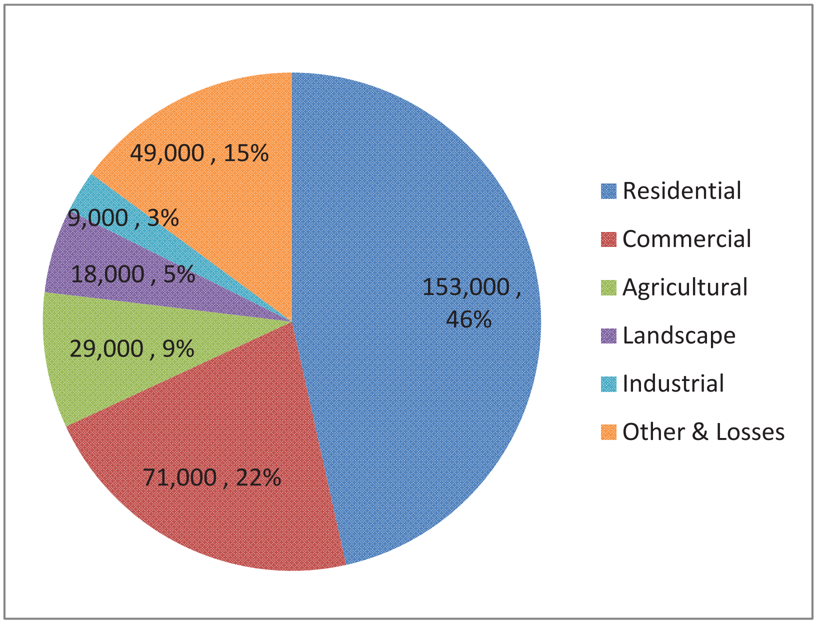
The District estimates that water demand would be higher, by about 51,000 AF in 2010 and 98,500 AF in 2035, if not for the community's efforts to conserve water. Water conservation reduces the need to make investments in new, more expensive capital facilities and is a critical element of meeting the community's future water needs. Figure 1 illustrates historic and projected water use and population. The drops in water use in Figure 1 are associated with the droughts of 1976 to 1977, 1987 to 1992, and 2007 to 2009.

Figure 1. Historic and Projected Water Use and Population[1]



The community uses water for a number of purposes, including residential, commercial, industrial, landscape irrigation, and agriculture. Figure 2 shows percentage of water use by these sectors. Residents, who need water for basic sanitation and to support their quality of life, account for almost half the water used each year in the county. Nearly one-half of residential water use is outdoors. Commerce and industry need water for product manufacturing and delivery. Farmers need water to grow crops. Water shortages would have severe economic consequences. Water reductions of 10 to 30 percent, if imposed on commerce and industry, could result in local sales losses of $900 million to more than $10 billion, or about 7 percent of annual sales revenue (Sunding, 2010). In addition, shortages can lead to groundwater overdraft and land subsidence, which can damage infrastructure and increase flooding risks.

Figure 2. 2010 Water Use by Sector (AF, Percentage)



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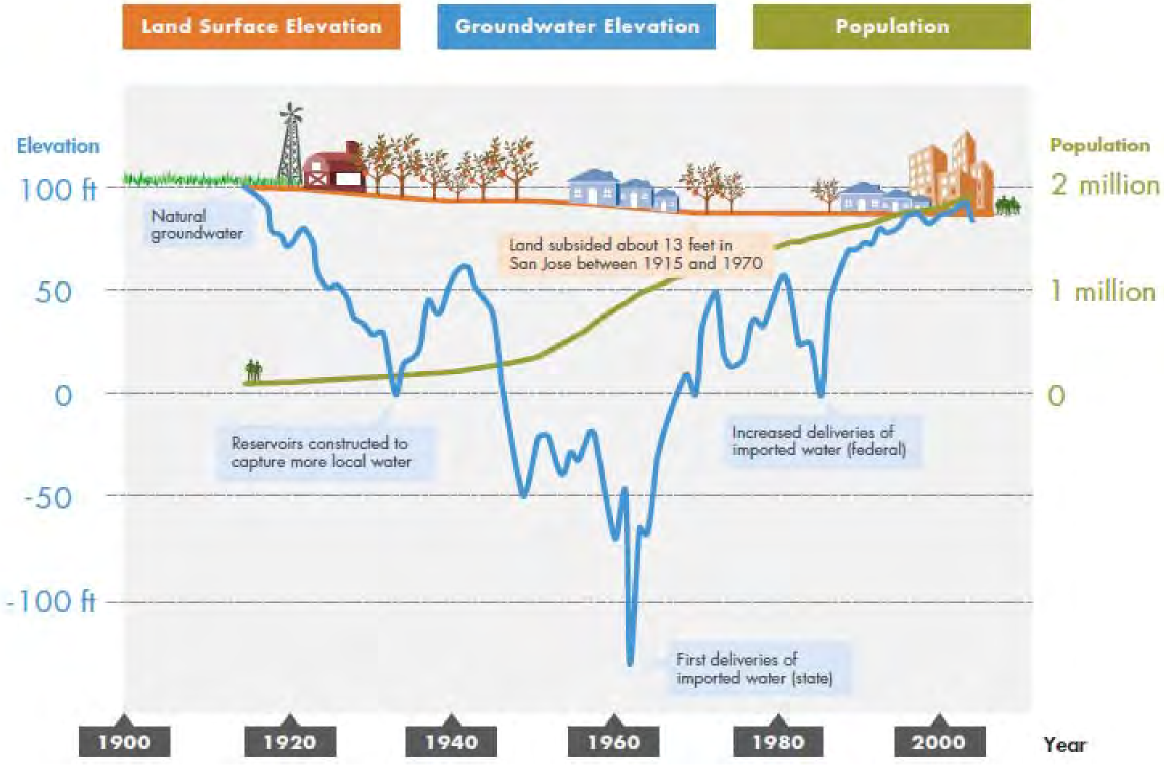
[1] Water use before 1988 is only for northern Santa Clara County.

Prior District Investments in Water Supply Reliability

Voters approved the formation of the Santa Clara Valley Water Conservation District, a predecessor to today's water district, in 1929 to develop and manage water supplies to meet the county's needs. Northern Santa Clara County had experienced land subsidence from pumping more groundwater than could be replaced or replenished through rainfall. In response, the District constructed six reservoirs in the 1930s to store winter rains for groundwater recharge and summer irrigation use. Four additional reservoirs were constructed in the 1950s,[2] nearly tripling local storage to about 169,000 AF. Still, local supplies were insufficient to meet the county's growing population and subsidence continued. In 1965, the District began importing water from the State Water Project for groundwater recharge and use at drinking water treatment plants. The District began receiving water from the Federal Central Valley Project in 1987. By the end of the 20th century, groundwater levels recovered and land subsidence was halted. The historic relationship between population growth, groundwater levels, subsidence, and water sources is illustrated in Figure 3.[3] As population and water use increases, the District will need to develop additional water supplies in order to meet the county's water needs and avoid land subsidence.

Figure 3. Relationship between Population Growth, Groundwater Levels, and Subsidence



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[2] Two reservoirs were constructed by the Santa Clara Valley Water Conservation District and two reservoirs were constructed by the South Santa Clara Valley Water Conservation District, which was annexed into the Santa Clara Valley Water District in 1987.

[3] Elevations are feet above or below mean sea level.

The District operates an integrated water supply system to meet demands in Santa Clara County. This consists of 10 dams, 17 miles of canals, four water supply diversion dams, 393 acres of recharge ponds, 91 miles of controlled in-stream recharge, 142 miles of pipelines, three drinking water treatment plants, and three pump stations. Local surface water and water imported from the Sacramento-San Joaquin River Delta (Delta):

- replenish the local groundwater subbasins, which are pumped for use by individual well owners and retail water suppliers,
- supply the District's drinking water treatment plants,
- are delivered directly to agricultural water users, and
- help meet environmental needs.

The District manages groundwater supplies in conjunction with surface water supplies. In wet years, excess supplies are stored in the local groundwater basin or the Semitropic Groundwater Bank in Kern County for use in dry years. This helps the District manage natural variations in rainfall and the associated variations in water supply availability.

Other agencies and organizations also contribute to water supply reliability in Santa Clara County. The San Francisco Public Utilities Commission (SFPUC) delivers water to retailers in northern Santa Clara County. Stanford University and San Jose Water Company hold their own surface water rights. All four of the county's wastewater treatment plants produce recycled water for non-potable uses such as irrigation and cooling towers. The county's water supply, treatment, and distribution facilities are illustrated in Figure 4.

Background of the Water Supply and Infrastructure Master Plan

The District Act states that one of the purposes of the District is "to do any and every lawful act necessary to be done that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants within the District." Furthermore, Board Policy states that "there is a reliable, clean water supply for current and future generations." One of the District's strategies for achieving this goal is to develop water supplies designed to meet at least 100 percent of average annual water demand identified in the District's Urban Water Management Plan during non-drought years and at least 90 percent of average annual water demand in drought years. The purpose, policy, and strategy recognize that a reliable water supply is vital to the social, economic, and environmental well-being of the county.

The District's mission is to provide for a healthy, safe, and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective, and environmentally-sensitive manner for current and future generations.

The analysis for the 2012 Water Master Plan found that the county's water supplies are insufficient to meet future water needs, primarily during droughts. Reserves would be depleted during extended droughts and short-term water use reductions of up to almost 30 percent (or about 119,000 AFY) would be needed to avoid land subsidence. The District has to make investments to fill this need. The District also needs to continue to make investments to maintain, restore, and replace its existing assets, some of which were constructed 75 years ago. The Water Master Plan provides a strategy for investments in new water supply projects and programs that builds on the District's existing assets and avoids making investments that are unnecessary or premature.

The Water Master Plan provides a strategy for investments in new water supply projects that builds on the District's existing assets and helps ensure timely, appropriate investment decisions.

Contents and Use of this Report

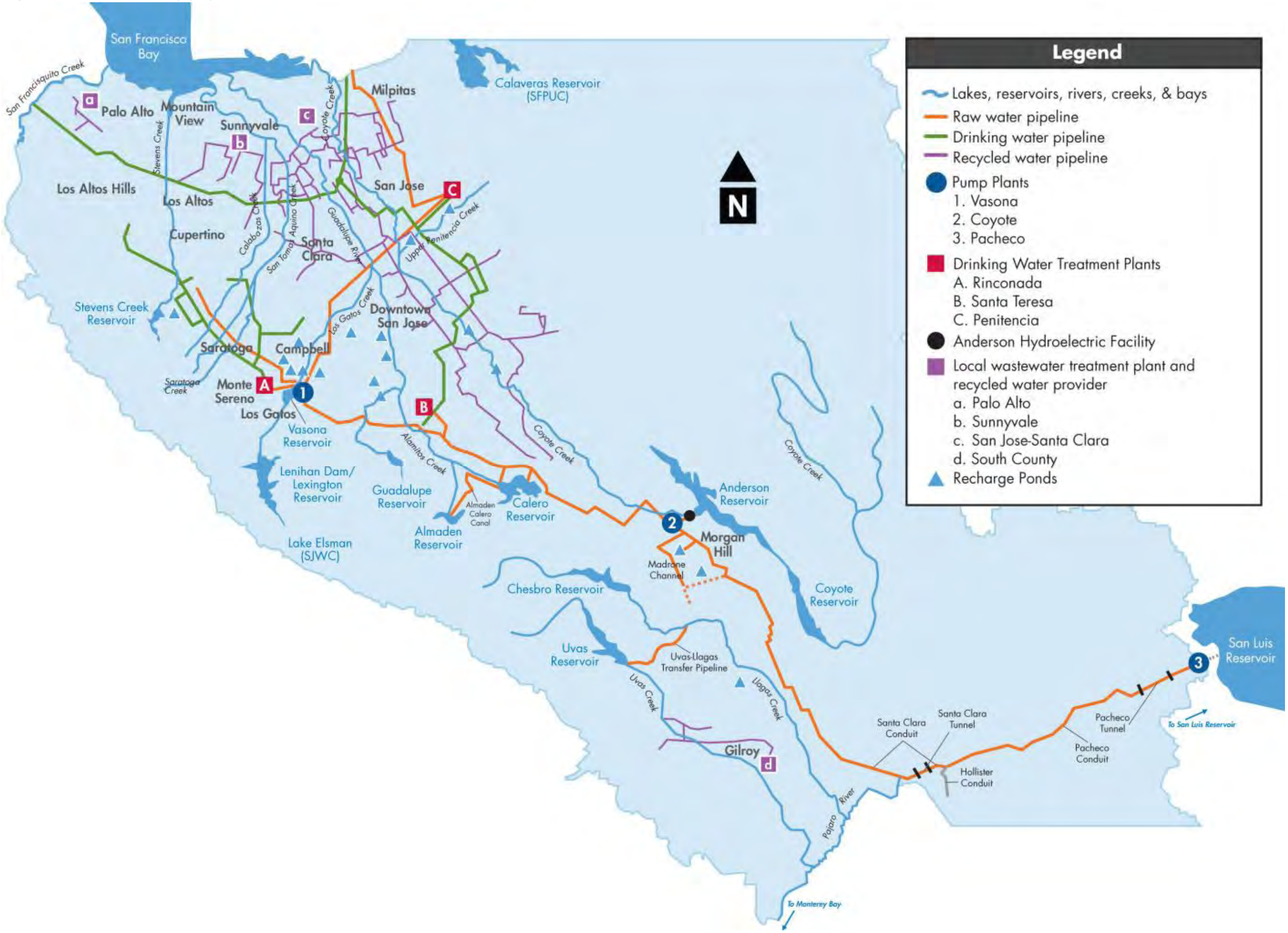
The Water Master Plan is organized as follows:

- Chapter 1 - The Importance of Water Supply Reliability, which discusses the community's water use and needs, the District's role in meeting those needs, and the background for the Water Master Plan.
- Chapter 2 - Challenges to Water Supply Reliability, which identifies the primary challenge of providing a reliable future water supply in Santa Clara County, and other risks to future water supply reliability.
- Chapter 3 – The Water Supply Strategy, which presents the District's strategy for meeting the county's future water supply needs.
- Chapter 4 – Next Steps, which describes how the water supply strategy will be implemented over time.

The references section of the report lists the documents that provided the basis for the 2012 Water Master Plan. The documents include the 2012 Water Supply and Infrastructure Master Plan Technical Report (Santa Clara Valley Water District, 2012), which documents the work done to develop the 2012 Water Master Plan. The Technical Report details the approach to developing the Water Master Plan, the data gathered during Water Master Plan development, the analyses performed, conclusions, and recommendations.

The Water Master Plan supports District Board of Directors decisions needed to ensure a reliable supply of safe, clean water for Santa Clara County. The water supply strategy provides a framework for investment decisions needed to secure existing water supplies and infrastructure and to meet future needs. The implementation schedule identifies the timing of key actions that are critical to the success of the strategy.

Figure 4. Water Supply, Treatment, and Distribution Facilities



2

WATER MASTER PLAN 2012

The District Needs to Develop Suppplies for Future Droughts

This chapter describes the water supply reliability outlook for Santa Clara County. The Water Master Plan evaluates the ability to meet projected water demands through Year 2035 with the baseline water supply system. The evaluation shows existing supplies are sufficient to meet most future demands in normal years, but will not meet needs in future droughts. In addition, several risks could affect future water supply reliability. Risks such as climate change, changes to regulations, and new policies could affect local and imported supply availability. The District's strategy is to develop supplies that will meet future drought year needs and address multiple risks.

Baseline Water Supplies are Sufficient to Meet Most Future Demands

The baseline water supply system consists of existing water supplies and infrastructure, including several improvements. The Water Master Plan assumes the District will improve existing dams to remove operating restrictions, expand Rinconada Water Treatment Plant capacity to 100 MGD, repair Main and Madrone Pipelines, increase non-potable recycled water use to about 30,000 AFY in 2035, and increase water conservation savings to about 99,000 AFY by 2030. The baseline water supply system will be sufficient to meet most average demands through 2035. Figure 5 and Table 1 show anticipated average water supplies from the baseline water supply system through year 2035. Until 2035, supplies exceed demands. In 2035, there is an estimated shortfall of about 2,000 acre-feet per year (AFY) between supplies and demands.

Baseline Water Supply System

- Existing natural groundwater recharge
- Existing local surface water supplies
- Recycled water use increasing from about 15,000 AFY in 2010 to about 30,000 AFY in 2035
- Existing imported water supplies
- Conservation savings increasing from about 51,000 AFY in 2010 to about 99,000 AFY in 2035
- Dam seismic retrofits and other improvements to remove operating restrictions
- Rinconada Water Treatment Plant capacity of 100 million gallons per day
- Main and Madrone Pipeline repairs

Figure 5. Average Water Supplies Through 2035

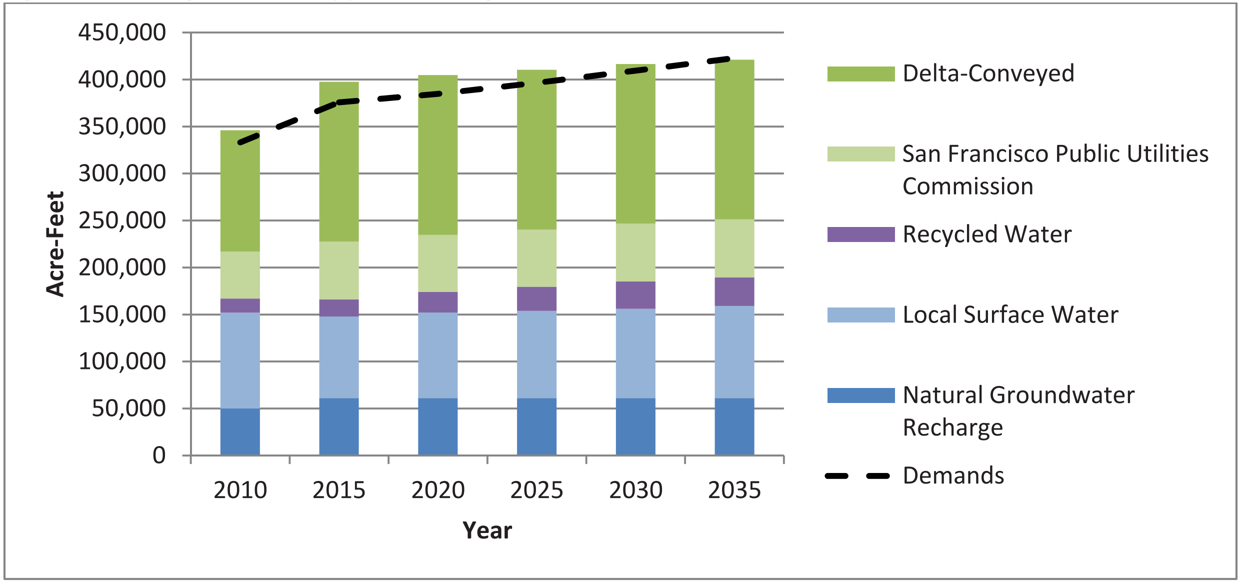


Table 1. Average Water Supplies Through 2035

Source of Supply (Acre-Feet)	2010 (Actual)	2015	2020	2025	2030	2035
Natural Groundwater Recharge	50,000	61,000	61,000	61,000	61,000	61,000
Local Surface Water	102,000	87,000	91,000	93,000	95,000	98,000
Recycled Water	15,000	18,000	22,000	26,000	29,000	30,000
SFPUC	50,000	62,000	61,000	61,000	61,000	62,000
Delta-Conveyed	129,000	170,000	170,000	170,000	170,000	170,000
Total Supply (Acre-Feet)	346,000	398,000	405,000	410,000	417,000	421,000
Total Demand (Acre-Feet)	333,000	376,000	385,000	396,000	409,000	423,000

Local Water Supply Sources

The groundwater subbasins are naturally recharged with rainfall, seepage from surrounding hills, seepage into and out of the groundwater subbasin, leakage from pipelines, and irrigation return flows. Natural groundwater recharge varies based on rainfall and groundwater levels. On average, natural groundwater recharge provides about 61,000 AFY of supply.

Local reservoirs and streams capture rainfall and run-off. This water is used for recharge, irrigation, or drinking water treatment. On average, the District's local surface water supplies will provide about 87,000 AFY in 2035.[4] On average, San Jose Water Company and Stanford University local surface water supplies provide additional supplies of about 11,000 AFY.

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[4] Currently, District surface water supplies are constrained to an average of about 76,000 AFY by operating restrictions on local reservoirs for seismic safety. These supplies are anticipated to be restored by 2025.

Recycled water is a local water supply source that is not dependent on rainfall. Recycled water is produced by the county's four publicly-owned wastewater treatment plants. It is municipal wastewater that has been treated to levels that make it appropriate for various non-drinking water (non-potable) purposes. Non-potable recycled water use is projected to increase from about 15,000 AF in 2010 to 30,000 AF in 2035.

Imported Water Supply Sources

Imported supplies are used to meet a large percentage of county water needs–about 55 percent on average. Imported water conveyed though the Delta via the State Water Project (SWP) and Central Valley Project (CVP) is used to supply District drinking water treatment plants, groundwater recharge facilities, and irrigators. On average, more than 70 percent of Delta-conveyed supply is delivered to treatment plants, almost 30 percent is used for recharge, and a small percentage is delivered to irrigators. In addition, when available, the District stores excess Delta-conveyed supplies in the Semitropic Groundwater Bank and San Luis Reservoir in the Central Valley, and locally in Anderson and Calero Reservoirs. The District has a contract for 100,000 AFY of SWP water and 152,500 AFY of CVP water. However, the actual amount of water allocated under these contracts each year is typically less than these contractual amounts and depends on hydrology and regulatory restrictions. The average allocation of Delta-conveyed water is about 170,000 AFY and is not expected to change between now and 2035.

Santa Clara County began using San Francisco Public Utilities Commission (SFPUC) Hetch-Hetchy system water to supplement local supplies in 1952. This water is provided to north county cities with access to Hetch-Hetchy pipelines. On average, the SFPUC delivers about 61,000 AFY to Santa Clara County, which is not expected to change between now and 2035.

Supply Variability and Hydrology

Santa Clara County, like the rest of California, experiences drastic changes in year-to-year annual precipitation. The variation in precipitation, both locally and in the Sierra Nevada Mountains, results in fluctuations in the amount of water supply available from year to year. In many years, annual supplies exceed demands, while in some years demands can greatly exceed supplies. Figure 6 and Table 2 illustrate county water supplies under different hydrologic conditions compared to projected water demands in 2035.[5] The supplies shown do not include the use of reserves, which will lessen any shortfalls.

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[5] The extended drought supplies are the average over a six-year drought period. Some years are less dry than others, so the average is higher than in a single critical dry year. Also, natural groundwater recharge is higher than average in a critical dry year due to increased seepage into the groundwater subbasins as groundwater levels decline.

Figure 6. Water Supplies under Different Hydrologic Conditions

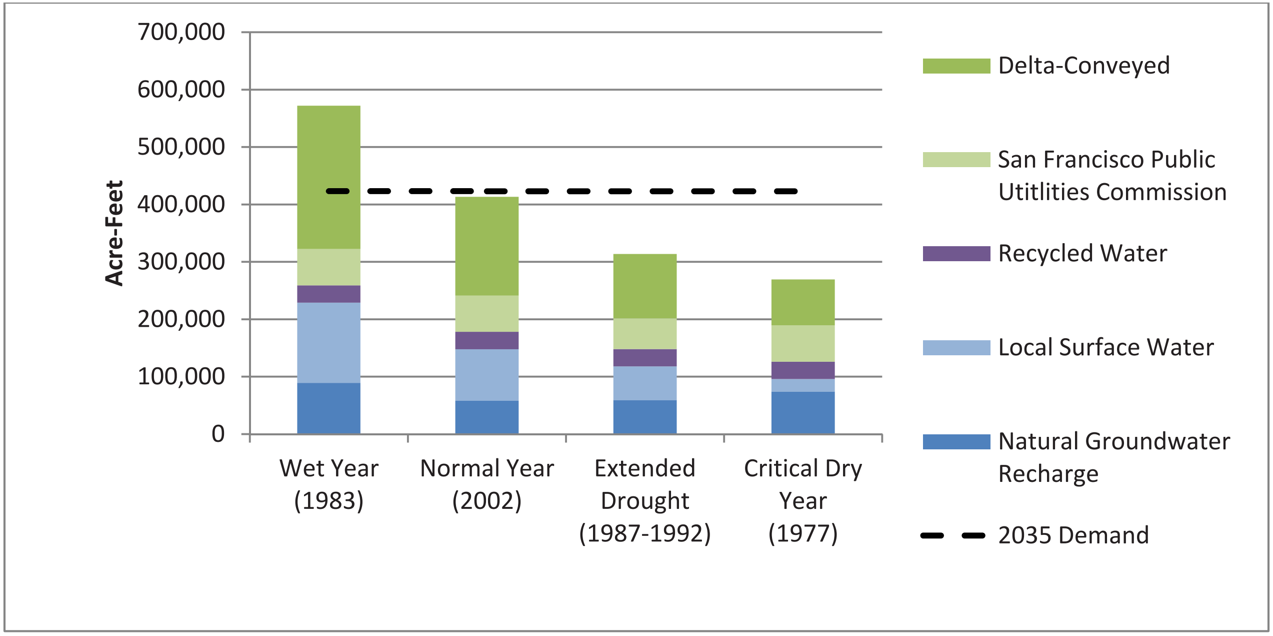


Table 2. Water Supplies under Different Hydrologic Conditions

Source of Supply (Acre-Feet)	Wet Year (1983)	Normal Year (2002)	Extended Drought (1987–1992)	Critical Dry Year (1977)
Natural Groundwater Recharge	89,000	58,000	59,000	74,000
Local Surface Water	140,000	90,000	58,000	22,000
Recycled Water	30,000	30,000	30,000	30,000
SFPUC	63,000	63,000	54,000	63,000
Delta-Conveyed	249,000	172,000	112,000	80,000
Total Supply (Acre-Feet)	**571,000**	**413,000**	**313,000**	**269,000**
Surplus or (Shortfall) (Acre-Feet)	**148,000**	**(10,000)**	**(110,000)**	**(154,000)**

The District's basic water supply strategy to compensate for this supply variability is to store excess wet year supplies in the groundwater basin, local reservoirs, San Luis Reservoir, or Semitropic Groundwater Bank. The District draws on these reserve supplies during dry years to help meet demands. These reserves are sufficient to meet demands during a critical dry year and the first several years of an extended drought.

Future Droughts are the Primary Water Supply Challenge

Water supply reserves are insufficient to meet needs throughout an extended drought. Due to growing demand, water supply shortages during droughts begin to appear in 2015 and increase in magnitude and frequency over time. By 2035, without new supplies or conservation savings, shortages could occur in about 11 percent of years, and supplies would only be able to meet about 70 percent of average demand during some years. Short-term water use reductions of up to almost 30 percent (or 119,000 AFY) would be needed to avoid shortages and minimize the risk of land subsidence. Figure 7 and Table 3 show the supplies and groundwater reserves that would be available in 2035 during a six-year drought like the one that occurred between 1987 and 1992.

Figure 7. 2035 Baseline Supplies and Reserves Available during an Extended Drought

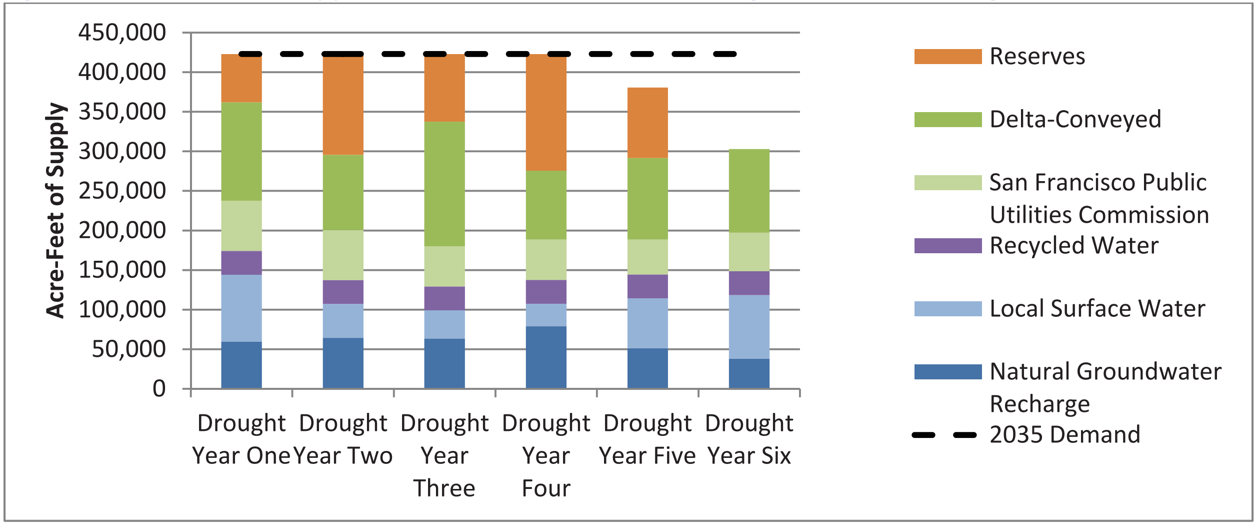


Table 3. 2035 Baseline Supplies and Reserves Available during an Extended Drought

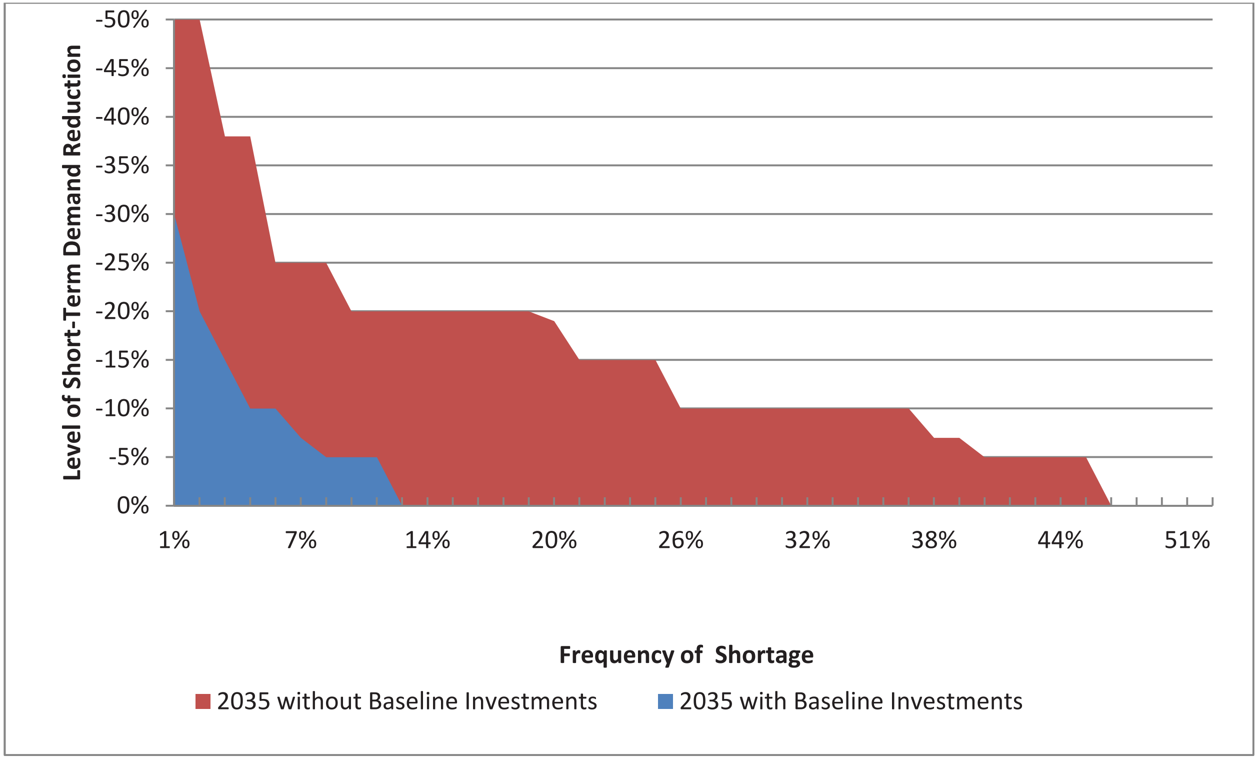
Source of Supply (Acre-Feet)	Drought Year One	Drought Year Two	Drought Year Three	Drought Year Four	Drought Year Five	Drought Year Six
Natural Groundwater Recharge	60,000	64,000	64,000	79,000	51,000	38,000
Local Surface Water	84,000	43,000	35,000	29,000	63,000	81,000
Recycled Water	30,000	30,000	30,000	30,000	30,000	30,000
SFPUC	63,000	63,000	51,000	51,000	44,000	49,000
Delta-Conveyed	125,000	95,000	157,000	87,000	103,000	106,000
Reserves	61,000	127,000	85,000	147,000	89,000	0
Shortfall (Acre-Feet)	0	0	0	0	43,000	119,000

A Secure Baseline and New Dry Year Supplies Are Needed to Meet Future Water Needs

First and foremost, the District will continue to depend upon its baseline water supply system to support future needs. Therefore, it is critical that the District make investments to secure the baseline water supply system. Without the baseline investments, the water supply outlook would be worse. Shortages would occur sooner and more frequently, and could be more severe, without the baseline water supply system investments.

Figure 8 illustrates the importance of baseline investments in water supply reliability. The figure presents water supply shortages, represented by level of demand reductions during droughts, under two scenarios. The first scenario (shown in blue) reflects the assumption that the baseline water supply system will be in place in 2035. The second scenario (shown in red) shows shortages that would occur if local reservoir operating capacity is not restored, recycled water use is not expanded, and conservation does not increase as planned. This second “no action” scenario does not take into account likely additional imported water reductions that would occur if investments are not made in restoring the Delta ecosystem and reliable Delta conveyance, in which case there is a risk that greater shortages could occur.

Figure 8. Level of Short-Term Demand Reductions Required with 2035 Demands



Risks Threaten Water Supply Reliability

The water supply outlook assumes existing water supplies are available in the future. However, there are risks that threaten the reliability of the existing water supplies. The water supply strategy needs to address the need for drought year supplies and perform well under multiple risks. The risks are summarized below.

Climate Change

Evidence of climate change is already being observed in California. In the last century, the California coast has seen a sea level rise of seven inches, the average April 1 snow-pack in the Sierra Nevada region has decreased in the last half century, and wildfires are becoming more frequent, longer, and more wide-spread (U.S Environmental Protection Agency, 2011). Temperature projections for the Bay Area show a shift in the timing of spring and summer heat extremes (Ekstrom, 2012), as well as an increase in the frequency and intensity of heat waves (Cayan, 2012). These temperature changes could result in changes in water demands. Predictions for the Southwestern US and California generally indicate that reduced quantity of surface water from local runoff is likely. Climate models suggest a drying tendency and a decline in the frequency of precipitation events, but not a clear-cut change in the intensity of precipitation events. Historic precipitation data for California's central coast region shows a trend toward decreasing rainfall during the November to January period and a trend toward increasing rainfall during the February to April period.

Climate change is a global phenomenon, though it is manifested differently in different regions.

The District's vulnerabilities to climate change include increases in seasonal irrigation demands, a decrease in imported water supplies as a result of reduced snow pack and a shift in the timing of runoff, a decrease in local surface water supplies as result of reduced precipitation and shifts in the timing of runoff, more frequent and severe droughts, changes in surface water quality associated with changes in flows and temperature, and changes in imported water quality due to salinity intrusion in the Delta.

Potential effects of climate change on Delta-conveyed imported water supply availability have been incorporated into the water supply projections in the Water Master Plan because they have been developed for the watersheds that provide the supplies (California Department of Water Resources, 2009). However, potential climate change effects on local supplies and demands have not yet been incorporated into the Water Master Plan, because the analysis to support such forecasts have not yet been completed. The District needs to be proactive in compiling and analyzing data that could provide insights into potential local changes in runoff, water quality, and demands. The District also needs to implement a water supply strategy that will adapt well to future climate change by managing demands, providing drought-proof supplies, and increasing system flexibility in managing supplies.

Reductions in Imported Water Supplies

In the last 15 years, major changes have been made to state and federal water project operations as a result of regulations to protect Delta water quality and help recovery of endangered and threatened fish species. These regulations reduce Delta exports at certain times of the year and there is the possibility of more stringent requirements in the future. To address this risk, the District is participating in development of the Bay Delta Conservation Plan to achieve co-equal goals of water supply reliability and ecosystem restoration for the Delta.

The California Aqueduct delivers Delta-conveyed supplies to municipal, industrial, and agricultural customers

The District's CVP municipal and industrial (M&I) water supplies are provided pursuant to an interim administrative policy that gives priority to CVP M&I water service over CVP agricultural water service. The United States Bureau of Reclamation (Reclamation) is in the process of finalizing this policy. To mitigate the impacts of and provide support for the policy, the District entered into a supplemental agreement with agricultural districts in the San Luis and Delta-Mendota Water Authority and Reclamation. If Reclamation's final M&I policy substantially changes or the supplemental agreement is not maintained, there is a risk that the District's CVP supplies could be reduced by as much as 40,000 AFY in the future.

The quantity of SFPUC supplies used in the county could be reduced in the future. This could result from retailers' shift of their use as SFPUC supplies become more expensive than District groundwater, or from a SFPUC supply interruption to the cities of San Jose and Santa Clara, which have temporary and interruptible contracts with SFPUC. SFPUC will supply a combined annual average of about 10,000 AFY to the cities of San Jose and Santa Clara through 2018, subject to interruption or reduction. By December 31, 2018, SFPUC will make further decisions regarding long-term water supplies through 2030. The District will support local water retailer efforts to secure long-term water supplies from SFPUC.

Revenue Requirements

For the decades ahead, the highest priority work of the District's Water Utility Enterprise is to implement a program of activities to ensure that water supplies are diversified and reliable to meet current and future demands and that treated water quality standards are met. This program of operations, maintenance, and capital improvement activities that support direct and in-lieu groundwater recharge will require increased funding from groundwater production charges and other sources of revenue.

The District continues to monitor those risks that can change the water supply outlook and works to influence key external decisions that have the potential to impact water supply reliability. The Water Master Plan will be reviewed annually and updated at least every five years. This planning cycle allows risks to be evaluated on an ongoing basis, so that the water supply strategy can be updated as better information becomes available.

Provided the baseline system remains intact, existing water supply sources are sufficient to meet most of the county's water future supply needs in normal years and a single dry year.

Additional water supplies are needed to meet demands during extended droughts. Drought year shortfalls could occur as early as 2015 and will become severe by 2035. An extended drought in 2035 could result in the need short-term water use reductions of up to almost 30 percent (or about 119,000 AFY).

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WATER MASTER PLAN 2012

The Water Supply Strategy Ensures Sustainability

To provide a reliable supply of water to meet needs through 2035 the District's Ensure Sustainability water supply strategy relies on the following three elements:

1. secure baseline supplies and infrastructure,
2. optimize the use of existing supplies and infrastructure, and
3. increase recycling and water conservation to meet future increases in demands.

This strategy ensures sustainability because it meets future increases in demands with conservation and recycling, builds on the existing baseline system, and manages risks to water supply reliability from climate changes and reduced imported water supplies. The strategy is also consistent with District policies and stakeholder interests.

The Elements of the Ensure Sustainability Water Supply Strategy Work Together

The three elements of the Ensure Sustainability water supply strategy work together. The baseline water supply system will continue to support most of the county's future water needs. Optimizing the use of existing supplies and infrastructure leverages the investments the District has already made in water supply reliability and increases the system's flexibility. Additional recycling and conservation will bridge the gap between existing system capability and future demands, as well as manage risks from climate change and imported water reductions. Each of the water supply strategy elements is discussed below.

1. Secure Baseline Water Supplies and Infrastructure

The baseline water supply system is the most critical element of the water supply strategy, because it will provide the most water supplies and is the foundation of future water supply investments. The baseline water supply system is comprised of the existing and already planned water supplies and infrastructure. The Water Master Plan is built on the assumption that the baseline system will be available through the planning horizon of 2035. Baseline water supplies are expected to increase from the current average of about 398,000 AFY to an average of 421,000 AFY in 2035. The

Baseline Water Supply System

- Existing natural groundwater recharge
- Existing local surface water supplies
- Recycled water use increasing from about 15,000 AFY in 2010 to about 30,000 AFY in 2035
- Existing imported water supplies
- Conservation savings increasing from about 51,000 AFY in 2010 to about 99,000 AFY in 2035
- Dam seismic retrofits and other improvements to remove operating restrictions
- Rinconada Water Treatment Plant capacity of 100 million gallons per day
- Main and Madrone Pipeline repairs

increase in baseline supplies is due to removal of operating restrictions on existing reservoirs and increased non-potable water recycling. Baseline conservation savings are projected to increase from about 53,000 acre-feet (AF) in 2011 to about 99,000 AFY by 2030. These savings reduce demands on the water supply system and the need for more capital-intensive improvements. Ensuring adequate investment in the existing system is critical to reliability because, without the baseline system, future water supply shortages could be severe.

2. Optimize the use of Existing Supplies and Infrastructure

Groundwater Recharge

To fully utilize additional supplies that could be developed under the Ensure Sustainability strategy, new groundwater recharge ponds will increase the District's groundwater recharge capacity. The yield from the new ponds is about 3,300 AFY on average. The recharge ponds could be located on the west side of the valley, along Saratoga Creek near Highway 85. Additional groundwater recharge ponds provide additional capacity to process wet-weather flows and help maintain groundwater levels, both of which help manage risks due to climate change and supply interruptions. The estimated present value cost of new groundwater recharge ponds is about $14 million.

Reservoir Pipeline

Pipelines transport water and add flexibility to water supply system operations.

A connection between Lexington Reservoir and the raw water system will provide greater flexibility in using existing local water supplies. The reservoir pipeline will allow surface water from Lexington Reservoir to be put to beneficial use elsewhere in the county, especially when combined with the indirect potable reuse project described below. In addition, the pipeline will enable the District to capture some wet-weather flows that would otherwise flow to the Bay. The pipeline is expected to provide an average annual yield of 1,500 acre-feet. The estimated present value cost of the reservoir pipeline is about $10 million.

Imported Water Reoperations

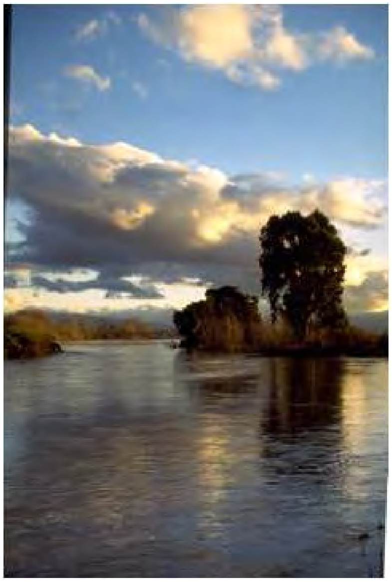
The District would reoperate the Semitropic Groundwater Bank when it is nearly full and the District water supply needs are otherwise met to sell or exchange up to 50,000 AFY of stored water. This would create additional space in the Semitropic Groundwater Bank for carryover of supplies during wetter years, maximize the value of the District's existing assets (imported water contracts and investment in the Semitropic Groundwater Bank), and potentially help fund investments in infrastructure and additional local supplies. The estimated present value benefit of imported water operations is about $74 million.

3. Increase Recycling and Conservation

Indirect Potable Reuse

Indirect potable reuse is a high-quality, local drought-proof supply that is resistant to climate change impacts and independent of the Delta. It will provide a new local supply for recharge, which will help maintain reservoir supplies that are used to meet flow and temperature requirements for fish in local creeks. Indirect potable reuse would also reduce discharges to South San Francisco Bay from the wastewater treatment plants. Using advanced treated recycled water for recharge also provides groundwater quality benefits, in that advanced treatment removes nearly all the salts from the water that is used for recharge, resulting in high quality water being recharged into the groundwater basin.

The Ensure Sustainability strategy relies upon development of indirect potable reuse to provide most of the new water supply to meet future water needs. The Water Master Plan assumes that at least 20,000 AFY of advanced treated recycled water will be available for groundwater recharge by 2030. A number of potential projects are being identified, and future development will be influenced by strategic planning currently underway in partnership with South Bay Water Recycling and others. For purpose of the Water Master Plan analysis, a project was assumed to use water that would be advanced treated at a facility at the San Jose/Santa Clara Water Pollution Control Plant and then pumped to existing recharge ponds in the Los Gatos Recharge System.



Indirect potable reuse includes delivering advance treated recycled water to groundwater recharge ponds

One challenge to indirect potable reuse will be overcoming some people's concerns about the quality of advanced treated recycled water. New regulations could also affect the benefits of indirect potable reuse. When State regulations move toward permitting direct potable reuse (putting advanced treated recycled water directly into pipelines that supply drinking water treatment plants), the District may want to consider that option as it adds flexibility, reduces costs, and potentially reduces energy use. The water supply strategy is to support indirect potable reuse by 1) conducting technical studies, 2) increasing public awareness, 3) monitoring regulatory development, and 4) participating in and conducting regional recycled water master planning. The estimated present value cost of indirect potable reuse is about $339 million.

Graywater reuse provides a sustainable supply of water for irrigation

Graywater Reuse Rebate Program

The graywater reuse rebate program will provide financial incentives to customers who install graywater reuse systems. This would result in about 300 AFY in water savings, at a relatively low cost. The program could be expanded to increase water savings, depending upon resolution of public agency concerns about groundwater quality, permitting, and public health issues. The estimated present value cost of a graywater reuse rebate program is about $3 million.

Water Supply Reliability Improvements Meet the Level of Service Goal

The District Board approved a long-term water supply reliability level of service goal on June 12, 2012. The goal is to develop supplies to meet at least 100 percent of average annual water demand identified in the District's Urban Water Management Plan during non-drought years and at least 90 percent of average annual water demand in drought years. This level of service is consistent with recommendations from the Stakeholder Review Committee. Figure 9 and Table 4 show water supply availability during an extended drought like the one that occurred from 1987 to 1992 with the Ensure Sustainability water supply strategy in place and the 2035 demand level.

Figure 9. Proposed Water Supplies during an Extended Drought with 2035 Demands

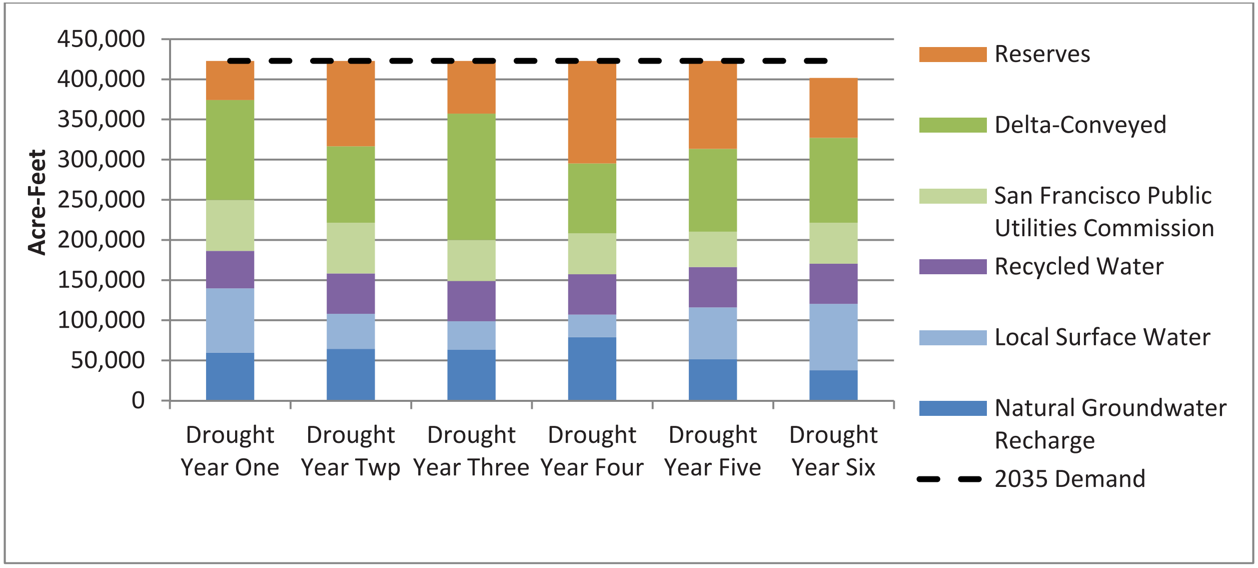
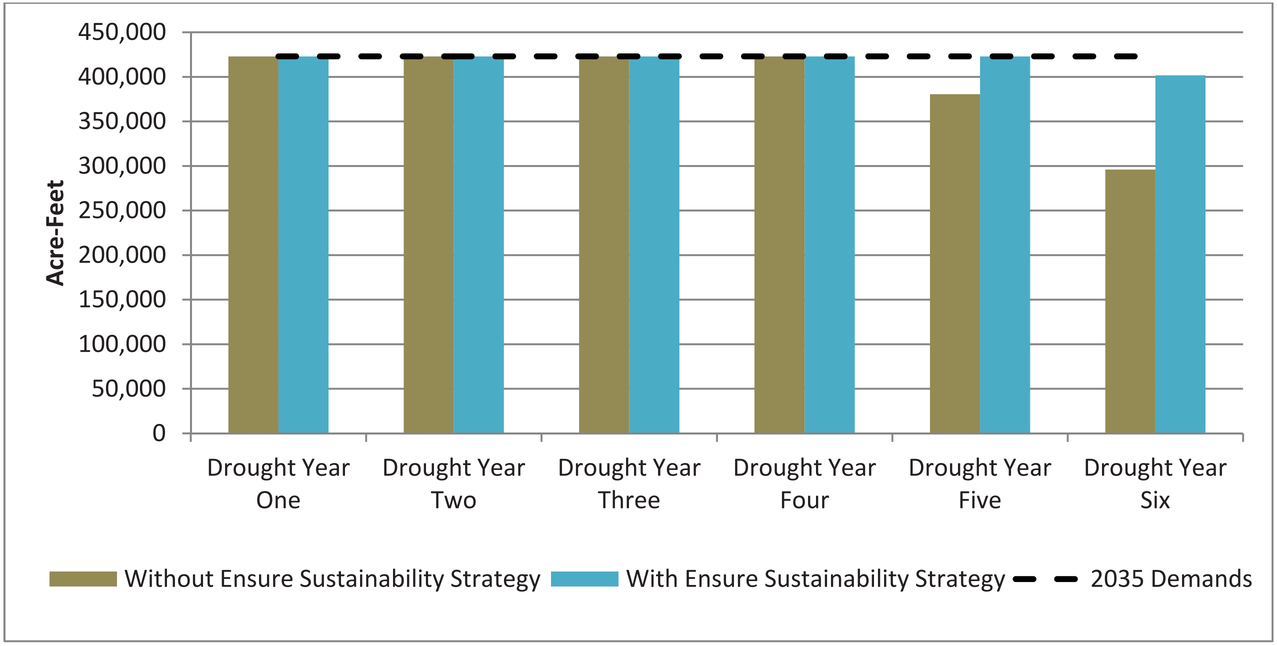


Table 4. Proposed Water Supplies during an Extended Drought with 2035 Demands

Source of Supply (Acre-Feet)	Drought Year One	Drought Year Two	Drought Year Three	Drought Year Four	Drought Year Five	Drought Year Six
Natural Groundwater Recharge	60,000	64,000	64,000	79,000	51,000	38,000
Local Surface Water	80,000	43,000	35,000	28,000	64,000	83,000
Recycled Water	47,000	50,000	50,000	50,000	50,000	50,000
SFPUC	63,000	63,000	51,000	51,000	44,000	49,000
Delta-Conveyed	125,000	95,000	157,000	87,000	103,000	106,000
Reserves	49,000	106,000	66,000	128,000	110,000	75,000
Shortfall (Acre-Feet)	0	0	0	0	0	22,000

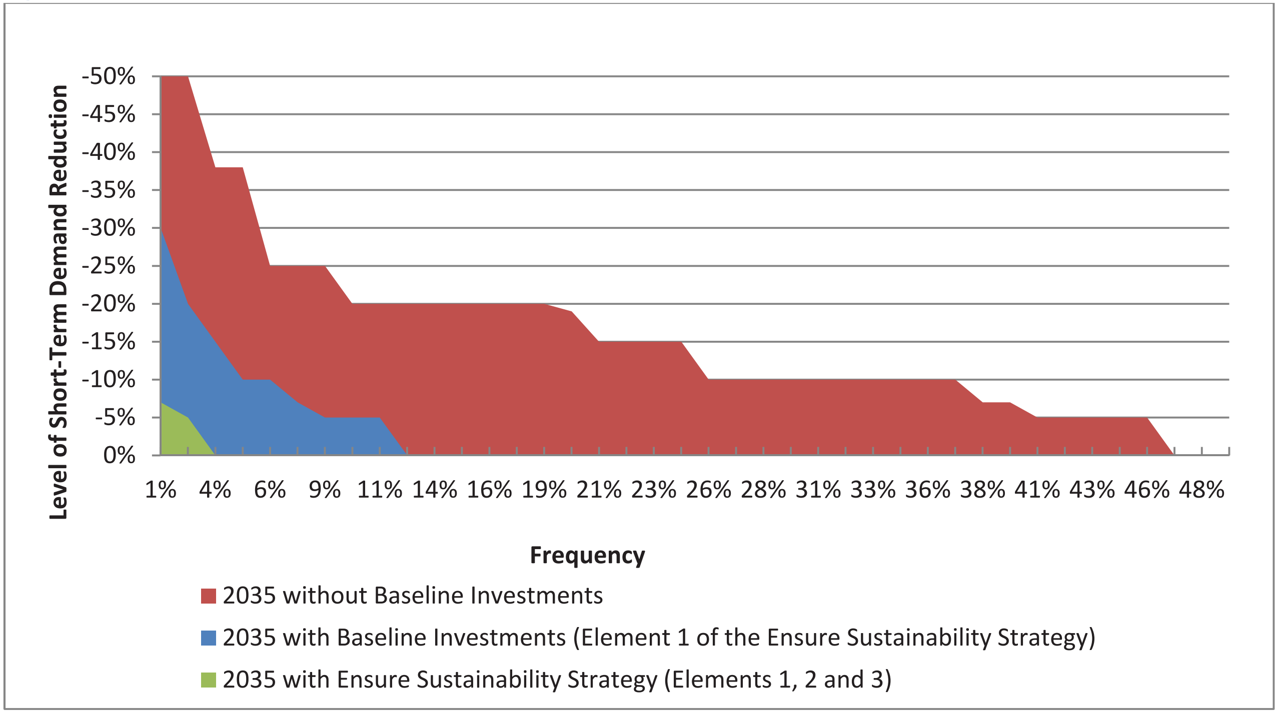
With the Ensure Sustainability Strategy in place, supplies are sufficient to meet 100 percent of demand during the first five years of drought and more than 90 percent of demands during the sixth year of an extended drought. This is consistent with the supply reliability level of service goal. Further, this is an improvement over the baseline projection, where existing supplies could only meet about 70 percent of demands during the sixth year of extended drought. Figure 10 compares baseline water supplies to proposed water supplies during an extended drought.

Figure 10. Comparison of Drought Supplies with and without the Ensure Sustainability Strategy



Implementation of the Ensure Sustainability water supply strategy would reduce the frequency and magnitude of short-term water use reductions under 2035 demands. Figure 11 shows shortages with different investment strategies. The small green area in Figure 11 shows that, with will full implementation of all elements of the water supply strategy, short-term water use reductions would occur only two percent of the time and the level of short-term water use reductions would be less than 10 percent. If only baseline investments are made consistent with Element 1 of the Ensure Sustainability Strategy, which is illustrated by the blue area in Figure 11, the model predicts that water use reductions would occur more often and the level of short-term water reductions could be as high as 30 percent. Water use reductions this high would necessitate water use restrictions and impact the local economy. Finally, the red area in Figure 11 shows short-term water use reductions without investments in the baseline system. Water use reductions would be needed almost half the time and in some years water supply would only be available to meet health and safety needs. This scenario does not take into account likely additional imported water reductions that would occur if investments are not made in restoring the Delta ecosystem and reliable Delta conveyance, in which case there is a risk that greater water use reductions would be needed.

Figure 11. Short-Term Water Use Reductions under Different Investment Scenarios



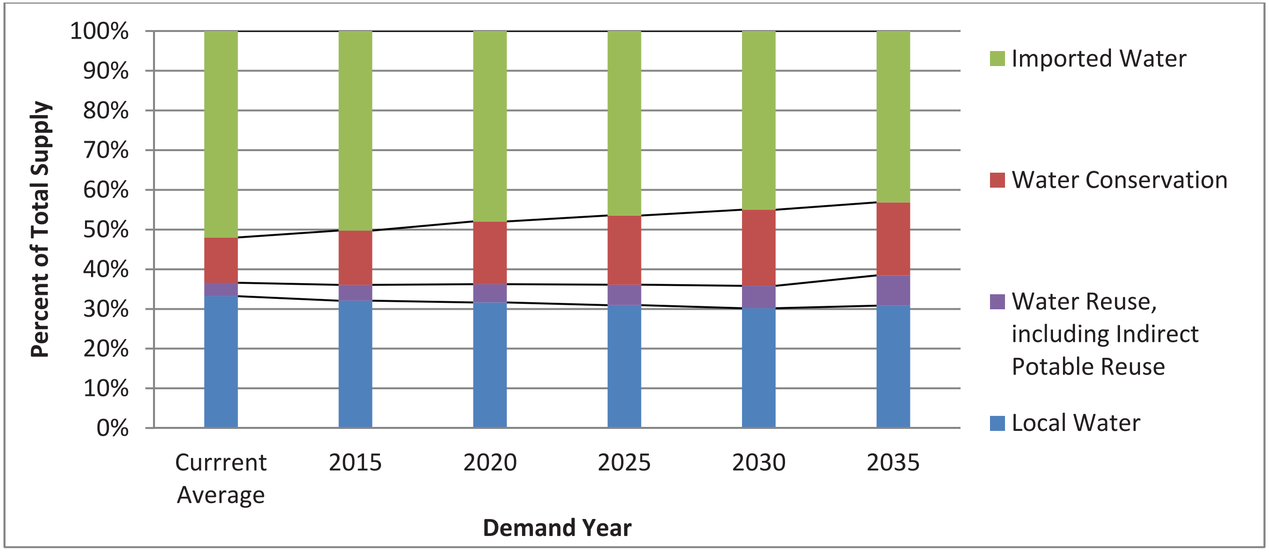
The Water Supply Strategy Supports Other Important Public Benefits

The key benefit of the Ensure Sustainability strategy is that it develops a new local drought-proof supply to achieve the District's strategy to develop supplies to meet at least 90 percent of demands during drought years. The strategy provides other benefits too. Some of these benefits are mentioned above, including helping to maintain reservoir supplies that are used to meet flow and temperature requirements for fish in local creeks, reducing wastewater discharges to South San Francisco Bay, and improving groundwater quality. The strategy builds on existing agreements with the City of San Jose and South Bay Water Recycling by developing indirect potable reuse. The additional groundwater recharge ponds and reservoir pipeline provide additional capacity to process wet-weather flows and help maintain groundwater levels, both of which help manage risks due to climate change and supply interruptions.

The Ensure Sustainability strategy includes imported water reoperations, which provides the benefit of maximizing the economic value of existing assets (imported water contracts and investment in the Semitropic Groundwater Bank) and helping fund investments into infrastructure and additional local supplies. Indirect potable reuse provides supply in every year, while the District's future shortages are primarily in extended droughts. Reoperations would also help create sufficient space in the Semitropic Groundwater Bank for carryover of supplies during wetter years.

Another important benefit of the Ensure Sustainability strategy is that it would reduce reliance on imported water supplies and increase water use efficiency, consistent with State policy to reduce reliance on imported water supplies for meeting future water demands. With the strategy in place, water use efficiency would increase from about 15 percent to about 26 percent. Figure 12 illustrates how the mix of countywide supplies and long-term conservation savings would change between now and 2035.

Figure 12. Change in Water Supply Mix over Time with the Ensure Sustainability Strategy



The Ensure Sustainability Strategy is Consistent with Stakeholder Input

The water supply strategy incorporates stakeholder input. The Stakeholder Review Committee (SRC) provided input and feedback on key Water Master Plan decisions and approaches throughout the planning process and concurred with the strategy. District Board Advisory Committees had opportunities to provide input during the Water Master Plan process. Staff also made presentations to the Water Retailers Committee, Water Retailer Subcommittees, and other agencies and organizations.

Stakeholders provided the following input on the Water Master Plan strategy and other water supply options:

- Maintain water supply reliability,
- Plan for population increases and climate change,
- Continue an aggressive level of water conservation programs,
- Evaluate regional recycled water projects,
- Consider indirect potable reuse projects and pursue direct potable reuse,
- Be aware of concerns about local reservoir expansion,
- Investigate regional projects such as the Regional Desalination Project or Los Vaqueros Reservoir Expansion that may provide dry-year options, and
- Address concerns about the reliability of imported supplies conveyed through the Delta.

Other Water Supply Options Are Not Recommended at This Time

The District considered a variety of water supply options for the Water Master Plan. Water supply options that stakeholders requested be included in the Water Master Plan, but are not recommended at this time, are discussed below.

Local Reservoir Expansion

A number of stakeholders expressed concerns about local reservoir expansion, while a number of stakeholders saw value in the increased storage provided by reservoir expansion. Staff analysis indicated that even an expansion project that would add 100,000 AF of storage would not significantly improve the ability to provide water through an entire drought, which is the primary challenge the Water Master Plan addresses. Storage would be depleted by about the fourth year of drought. Consequently, the water supply strategy does not include reservoir expansion. However, the District will re-evaluate reservoir expansion in the future as understanding of local climate change impacts improves, or in considering broader operational and water management needs such as emergency storage.

Expanding Anderson Reservoir was one of the options considered for the Water Master Plan

Direct Potable Reuse

Several stakeholders expressed an interest in the District implementing a direct potable reuse project, in which advanced treated water is added to the District raw water system and can be sent directly to drinking water treatment plants. At this time, California does not allow direct potable reuse. The California Department of Public Health (DPH) is required by law to determine the feasibility of developing regulations for direct potable reuse by December 2016.[6] The District will re-evaluate the feasibility of direct potable reuse after the DPH analysis is complete.

Regional Supply Options

The District has been participating in the Bay Area Regional Desalination Project feasibility study since 2003. The project is currently completing technical studies that will help inform different agencies' decisions regarding whether to proceed with participation in project design and construction. The Ensure Sustainability water supply strategy does not include continued participation in the Regional Desalination Project, because lower cost options such as dry-year option agreements would provide supplies with a similar level of reliability.

One stakeholder also expressed an interest in the District participating in an expansion of Los Vaqueros Reservoir, which is owned and operated by Contra Costa Water District (CCWD). CCWD recently expanded its Los Vaqueros Reservoir from 100,000 acre-feet to 160,000 acre-feet, and is continuing to explore further expansion. CCWD has characterized the 160,000 acre-foot expansion as having emergency and dry-year storage opportunities for local Bay Area agencies, but these opportunities have not yet been defined. Similar to local reservoir expansion, the usefulness of participation in Los Vaqueros in meeting multi-year drought water needs would be limited.

The District will further consider these regional projects as dry-year options if there is a mechanism for receiving the water in dry years that is independent of the conveyance through the Delta.

Rebates for Rainwater Harvesting and Other On-Site Stormwater Reuse Projects

The District supports efforts to reuse and infiltrate clean rainwater. However, offering rebates to incentivize these efforts is not currently cost-effective. For example, a large of amount of storage is required to harvest sufficient amounts of winter rainfall to meet a significant portion of summertime irrigation demands. The cost of this storage is far greater than the water savings that would be achieved. The District will continue to monitor these types of activities as potential future opportunities. The District will also continue to support low impact development policies that reduce water demands, protect water quality, and improve groundwater recharge.

Westside Intertie with the San Francisco Public Utilities Commission

The District and San Francisco Public Utilities Commission (SFPUC) currently have an emergency intertie between the two systems in Milpitas, on the east side of the District's treated water system. The intertie improves reliability for customers of both systems during outages and interruptions. In addition, the District's eastside treated water system has pipeline and treatment facility redundancy. The District's westside treated water system currently lacks an intertie and redundancy. The Westside

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[6] California Water Code Section 13563

Intertie would extend the District's West Pipeline approximately 29,500 feet to connect to the SFPUC system. This project would provide capability to convey up to 50 MGD of water between the SFPUC and District systems, providing emergency back-up supply to both systems. This could also provide some redundancy for Palo Alto and other cities that rely heavily on SFPUC supplies. The estimated cost for the project ranges from about $100 million for a pipeline extension to about $250 million for paralleling the West Pipeline. Paralleling the West Pipeline would also provide some redundancy for the District's westside treated water system. This project is not recommended in the Water Master Plan because it does not contribute to long-term supply reliability. However, it will be considered during a planned Infrastructure Reliability Master Plan.

4

WATER MASTER PLAN 2012

Implementation Will Be Phased In Over Time

Implementation of the Ensure Sustainability water supply strategy will occur over the 2035 planning horizon. Planned investments in water conservation, water recycling, and the existing water supply system will provide for most of the increased water supply needed to meet future demands. This gives the District time to conduct the necessary work to support the most costly project in the water supply strategy: indirect potable reuse. Necessary work includes building the foundation of public support, researching advancements in treatment effectiveness and efficiency, and monitoring regulatory developments. This chapter contains detailed information on what activities can be undertaken to implement the Ensure Sustainability strategy. The chapter concludes with information regarding monitoring and future updates to the Water Master Plan.

Phased Implementation Will Help Ensure Efficient and Effective Investments

The implementation plan consists of five phases over the next 20 years. An overview of the plan is shown on the following page in Table 5. A summary of the implementation plan for new projects and programs is below.

- **Phase A: 2012 – 2016:** Further studies and planning for projects and programs, as well as public education, outreach, and engagement.
- **Phase B: 2017 – 2021:** Project level planning and design for new recharge ponds, the reservoir pipeline, and the IPR project, as well as beginning imported water reoperations and the graywater reuse rebate program.
- **Phase C: 2022 – 2026:** Complete design and begin construction of IPR; construct groundwater recharge ponds and the reservoir pipeline.
- **Phase D: 2027 – 2031:** Complete construction of IPR and begin operations.
- **Phase E: After 2031:** Operation of all new projects and programs.

The District will monitor water supply conditions, update assumptions, and periodically validate this implementation plan. The Water Master Plan does not commit the District to a particular course of action. To capture changing conditions such as changes in supply and demand projections, climate, regulations, and baseline systems, the District will conduct a master plan update every five years and will adjust the strategy and implementation plan accordingly.

Table 5. Implementation Approach

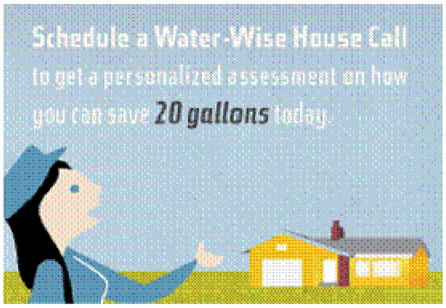
Strategy Element	Phase A: 2012 – 2016	Phase B: 2017 – 2021	Phase C: 2022 – 2026	Phase D: 2027 – 2031	Phase E: After 2031
1. Secure Existing Supplies and Infrastructure (Baseline Water Supply System)	• Participate in Recycled Water Master Plan Updates • Continue expanding water conservation savings • Bay Delta Conservation Plan completion • Secure SFPUC supplies • Secure Dry-Year Option Agreements • FAHCE Settlement completion • Climate change studies • Infrastructure Reliability Master Plan	• Continue expanding water conservation savings • Secure CVP M&I Allocation Agreement beyond 2022 • Dam seismic retrofits construction • Main and Madrone Pipelines rehabilitation • Replace Vasona Pumps • Secure Dry-Year Option Agreements	• Continue expanding water conservation savings • Secure Dry-Year Option Agreements	• Conservation program savings of 99,000 AFY • Renew CVP Water Supply Contract • Secure Dry-Year Option Agreements	• Recycled water use of approximately 30,000 AFY • Secure Dry-Year Option Agreements
2. Optimize the Use of Existing Supplies and Infrastructure *Adds about 5,000 AFY of supply*	• Negotiate and obtain any necessary permits for imported water reoperations	• Groundwater recharge ponds planning study and design • Reservoir pipeline planning study and design • Begin imported water reoperations	• Construct groundwater recharge ponds • Construct the reservoir pipeline • Continue imported water operations	• Begin operating new facilities • Continue imported water reoperations	• Continue operating new facilities and imported water reoperations
3. Increase Recycling and Conservation *Adds about 20,000 AFY of supply*	• Continue public outreach and engagement on recycled water • Monitor advanced recycled water treatment effectiveness • Monitor recycled water and conservation regulations and policies • Develop groundwater protection guidelines for graywater reuse	• Continue public outreach and engagement on recycled water • Indirect potable reuse planning study and design • Begin graywater reuse rebate program	• Indirect potable reuse project design and construction • Continue graywater reuse rebate program	• Indirect potable reuse construction and operation • Continue graywater reuse rebate program	• Indirect potable reuse operation • Continue graywater reuse rebate program
Estimated Cost for Baseline and New Investments, including Inflation	$1,114,000,000	$1,550,000,000	$2,097,000,000	$2,703,000,000	$3,416,000,000

1. Secure Existing Supplies and Infrastructure

This section describes how the Secure Existing Supplies and Infrastructure strategic element will be implemented over time. Information is presented on securing planned water conservation savings, planned recycled water expansions, local water supplies, imported water supplies, infrastructure improvements, and special studies.

Water Conservation

Most of the water conservation program in the next 20 years is related to continuing current and planned programs to reach the goal of about 99,000 AF of water conserved per year by 2030. It will be challenging to meet the current 2030 target for water conservation, as the District has already implemented many basic conservation programs including programs to reduce residential, commercial and industrial, and landscape water use. However, continued investments in expanding water conservations savings are critical to managing demands and providing a reliable supply of water.



Water-Wise House Calls is one of the District's many programs that help increase water conservation savings.

Recycled Water Activities

Non-potable recycled water use is projected to expand from about 15,000 AFY to 29,000 AFY by 2035. Currently, the recycled water producers and retailers in northern Santa Clara County are updating their recycled water master plans. In Phase A (2012 – 2016), the District will focus on participating in these master planning efforts, and postpone any further capital investments in recycled water until master plans are completed. Specific tasks related to recycled water master planning include:

- Partner in the development of a Recycled Water Master Plan for the South Bay Water Recycling (SBWR) system.
- Postpone investment in the Regional Recycled Water Connector project until the SBWR Recycled Water Master Plan is completed.
- Monitor and participate in Recycled Water Master Plans for the Palo Alto and Sunnyvale systems.
- Evaluate the need for a regional master plan after the SBWR, Palo Alto, and Sunnyvale master planning efforts are complete.
- Align District recycled water program goals with SBWR, Palo Alto, Sunnyvale, and South County Recycled Water Master Plans, or with a regional master plan.

Expanding non-potable systems is not without risks. A primary concern is that expansion of non-potable use could have negative impacts on groundwater quality. Continuing technical studies on the effects of irrigation with recycled water, and completing the Salt and Nutrient Management Plans for north and south county groundwater subbasins will help address this risk. Blending advanced treated recycled water also helps address this risk, and will become increasingly important as non-potable use is expanded. Another risk of expanding non-potable use is that assets may become stranded. As locations of recycled water use change, pipes to those areas may become obsolete. Recycled water master planning will help mitigate this risk.

This pipeline in Gilroy provides recycled water to a local farmer

The District will continue to look for opportunities for additional stormwater recharge throughout the planning horizon. The State's Recycled Water Policy requires that Salt and Nutrient Management Plans include stormwater recharge goals and objectives. The District already recharges about 50,000 AFY of stormwater through existing recharge facilities. The District will continue to look for opportunities for additional stormwater recharge as part of developing groundwater recharge capacity and planning flood protection projects. These types of projects could help optimize local supplies.

Local Supplies

Since 1996, the District has been working to address a legal challenge to its water rights in the Stevens Creek, Guadalupe River and Coyote Creek watersheds. Before the challenge can be resolved, the District must prepare a Habitat Conservation Plan (HCP) covering all three watersheds to provide incidental take coverage for all the activities included in the draft settlement agreement developed through the Fisheries and Aquatic Habitat Collaborative Effort (FAHCE). When implemented, and the necessary environmental reviews conducted, the plan will improve local fisheries and serve as the basis for dismissal of the water rights challenge. The District will continue work to ensure the FAHCE settlement agreement is implemented, thereby providing assurances that its water rights are protected from future challenges. The District expects to begin implementation of the FAHCE settlement agreement in the next five years.

Imported Water

Maintaining the availability and reliability of the county's imported supplies is a critical element of the water supply strategy. The District's state and federal imported water supplies, water banking in the Central Valley, and water transfer agreements all rely on conveyance of water through the Delta. The District is well aware of risks associated with Delta water including potential catastrophic levee failures and more stringent endangered species regulations. Other imported water risks include an interruption of SFPUC supplies to the cities of San Jose and Santa Clara and a loss of reliability in the District's CVP M&I water supplies.

Recommended actions to address these risks and secure baseline imported water supplies include participation in developing the Bay Delta Conservation Plan (BDCP), securing SFPUC supplies to the county, and supporting an acceptable CVP M&I water reliability policy.

District participation in the BDCP is expected to continue through the first phase of Water Master Plan implementation, depending on the outcome of permitting decisions that will be made in summer 2013. Securing SFPUC supplies to the county will also occur in the first phase of implementation, as SFPUC decisions about its contract with the cities of Santa Clara and San Jose are scheduled to be made by 2018. The District will work with water retailers on supply guarantees from SFPUC.

The Bureau of Reclamation is expected to complete environmental documentation and finalize its CVP M&I water shortage policy in the first phase of implementation, and the District will continue to implement its supporting supplemental agreement with CVP agricultural districts. This agreement is valid through 2022, and any needed work to extend it does not need to occur until the second phase of implementation.

Almost 40 percent of the District's current water supply is conveyed through the Delta

The District currently uses various imported water options to supplement supplies during water shortages. The Water Master Plan includes securing such dry-year supplies though dry-year option agreements. The amount of water secured in the option agreements increases from 6,000 AFY in Phase B, to 15,000 AFY in Phase C, to 23,000 AFY in the beginning of Phase D. Once indirect potable reuse supplies are available in Phase D, the option agreement amount decreases to 12,000 AFY.

Infrastructure

The Water Master Plan assumes the District will make investments to repair and improve its existing dams, so that the reservoirs can be operated at full capacity. The District needs to maintain all its local storage capacity. The District will continue to make seismic improvements to its dams including Anderson, Calero, Guadalupe, and Almaden. Dam seismic upgrades will not be completed until the end of Phase B, as some dams are still being studied to determine if retrofits are needed, and seismic retrofits take many years to complete. The District's FY 2013-17 Capital Improvement Program includes about $327 million for improvements at Anderson, Calero, Guadalupe, and Almaden dam. Additional investments may be needed to address seismic concerns at other dams that have not yet been studied completely.

The Main and Madrone pipelines are currently not being used to their design capacity but are needed for future supply reliability in the Llagas groundwater subbasin. The Water Master Plan assumes these two pipelines will be restored to full capacity. Without the pipelines restored, projected future shortfalls would be more severe. Restoration of the Madrone pipeline is more urgent, as it is not meeting current service requirements. The restoration of the Main and Madrone pipelines will be completed by the end of Phase B. Project planning and design should incorporate additional capacity in the pipelines (approximately five cubic feet per second) to accommodate potential future needs to increase groundwater recharge in the Morgan Hill area. The estimated capital cost of restoring the pipelines is about $8 million.


Pipelines and other infrastructure need periodic rehabilitation and replacement

The Vasona pumps need to be replaced, as they are approaching the end of their life-cycle. Based on the capacity analysis performed as part of the Water Master Plan, existing pump station capacity is adequate for typical operations now and with full implementation of the Water Master Plan. However, upsizing the pumps would add increased operational flexibility. The Water Master Plan recommends designing the pump station upgrades to include the ability to add additional pumping capacity in the future. The preliminary capital cost estimate for Vasona Pump Station upgrades is about $5 million.

Special Studies

The Water Master Plan analyzed the District's vulnerabilities to climate change and presents the Ensure Sustainability strategy that adapts to those vulnerabilities. However, the District currently has insufficient data for estimating climate change effects on local water supplies. In order to better analyze climate change impacts in future Water Master Plan updates, the District will gather additional data on temperature, precipitation, and water use and analyze the data for correlations and trends. This information will be used to help forecast local climate change impacts. Climate change studies will be completed in Phase A, so that quantitative estimates can be included in the analysis for the next Water Master Plan update.

The District's Water Utility needs a comprehensive Infrastructure Reliability Master Plan to ensure a reliable water supply infrastructure system is available for current and future use. The Water Master Plan evaluated the need for new and upgraded infrastructure to transport, treat, and store current and future water supply sources. However, the Water Master Plan focus was on long-term term water supply planning and developing the District's overall water supply strategy. The District's Water Infrastructure Reliability Project (IRP) was completed in 2005 and identifies operational and capital improvements needed for post-disaster reliability. Most of the identified improvements are being implemented, though the need for some elements (well fields) has changed. The District's Asset Management Program helps identify infrastructure renewals and replacements. Currently the program is focused on identifying renewals and replacements due to age or poor condition. A comprehensive Infrastructure Reliability Master Plan will address the reliability of the whole infrastructure system, analyze multiple modes of failure (mortality due to age or disaster, capacity, level of service), and address short-term service outages. The plan will identify projects and programs to ensure a secure and reliable infrastructure system.

Additional well fields, like the one housed in this building in Campbell, may be one approach to improving infrastructure reliability.

2. Optimize the Use of Existing Supplies and Infrastructure

This section describes how imported water reoperations, the reservoir pipeline, and new groundwater recharge ponds will be implemented to optimize the use of existing supplies and infrastructure.

The water supply strategy includes imported water reoperations to sell or exchange up to 50,000 AFY of imported water when Semitropic Groundwater Bank storage levels are nearly full and District water supply needs are otherwise met. In Phase A of implementation, the District will identify potential water transfer and exchange partners, and develop necessary agreements and approvals.

The water supply strategy adds new infrastructure to the water supply system – the reservoir pipeline and additional groundwater recharge ponds. The facilities add capacity to process wet-weather flows and increase system flexibility. Project-level planning and design for the reservoir pipeline and new ponds will begin in Phase B, and construction will occur in Phase C.

3. Increase Recycling and Conservation

This section describes how increases in water use efficiency, beyond those included in the baseline water supply system, will be implemented as part of the Ensure Sustainability Strategy.

Indirect Potable Reuse

The first phase of implementation (Phase A) for indirect potable reuse consists of continued stakeholder engagement, further study and testing of advanced treated water quality, monitoring state regulations regarding indirect and direct potable reuse, and confirming maximum brine and minimum fresh water flows that are necessary to support a healthy Bay ecosystem. The District will soon complete construction of the Silicon Valley Advanced Water Purification Center, an advanced water treatment facility that will produce up to 8 million gallons per day of highly purified recycled water. The District will use this facility to monitor and test treatment effectiveness for the proposed indirect potable reuse system. The Center will also serve as a center-piece to gain public support for use of advanced treated water in the water supply system.

The next master plan update (2016) will validate the project before making any large capital investment. Phase B through Phase E of implementation for IPR include project level planning, design, construction and operations, respectively.

Reverse osmosis treatment is one step in the purification process that makes recycled water suitable for potable purposes

One of the major risks associated with investing in indirect potable reuse is public perception. Fostering public acceptance is critical to the success of the indirect potable reuse project. Another risk is the potential for stranded assets. As purification technologies improve and more testing is completed, regulations may change to allow for direct potable reuse. If this occurs, pipelines from wastewater treatment plants to the ponds could become stranded assets. The extended implementation period helps to address these risks.

Water Conservation

The Ensure Sustainability strategy adds one new water conservation program: graywater reuse. In the first phase of implementation, the District will develop groundwater protection guidelines and program details. Groundwater protection guidelines will address concerns with the quality of the graywater potentially being returned to the aquifer. This rebate program will begin in about 2017, during Phase B.

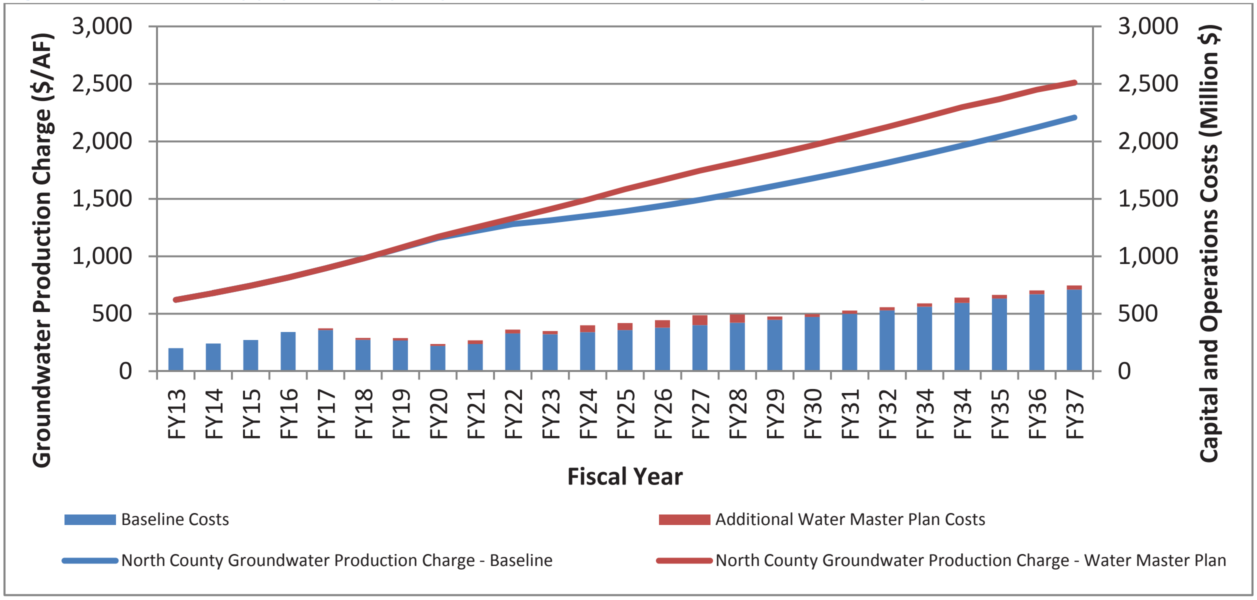
Conservation is dynamic with new technologies being developed, new implementation methods being tested, and associated costs declining. The District will continue to monitor technology and policy developments that may create new opportunities for increased conservation. The District will also continue to encourage land use agency efforts to implement low-impact development and monitor opportunities to increase conservation through land use policy. Developments in either of these areas may result in new conservation activities becoming feasible for future Water Master Plan updates.

Water Supply Costs Will Also Be Phased

> *"I would rather answer calls about water rate increases than have to tell someone I can't deliver water to them."*
> *– Stakeholder Review Committee Member*

Stakeholders value water supply reliability and most are willing to pay for it. The Stakeholder Review Committee was almost unanimous in their support of the Ensure Sustainability water supply strategy, even though it costs much more than other water supply options. The economic analysis found that the benefits of the water supply strategy are more than double the costs. The present value cost of the water supply strategy, excluding securing the baseline water supply system, is about $440 million. This does not include a potential present value benefit of about $70 million from imported water reoperations. The estimated impacts on groundwater production charges in Zone W-2 in northern Santa Clara County range from no incremental change up to a peak increase of about $335/AF in 2034. By that time, the groundwater production charge for the baseline water supply system is projected to be about $1,960/AF, based on the District's future investments that are necessary to maintain the baseline water supply system. The Ensure Sustainability strategy, as laid out in this plan, will have minimal effects on groundwater production charges in Zone W-5 in southern Santa Clara County, because most of the new investments benefit Zone W-2. Figure 13 shows the anticipated impacts of the water supply strategy on groundwater production charges in Zone W-2 (North County).

Figure 13. Water Supply Strategy Impacts on Groundwater Production Charges



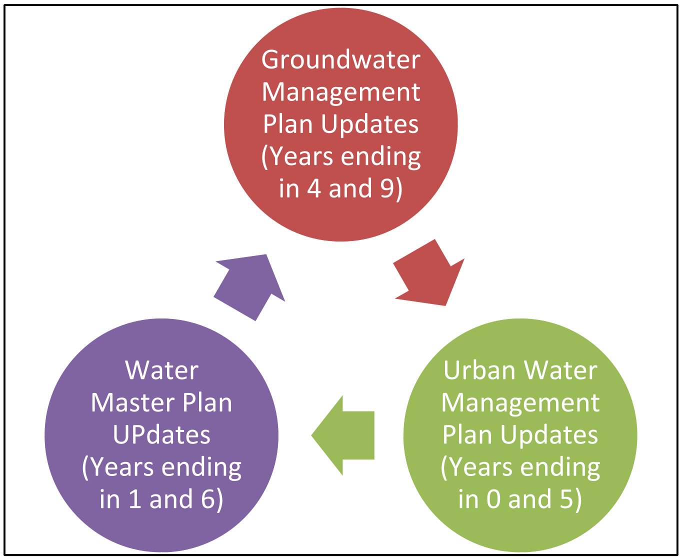
The District may be able to reduce costs for the water supply strategy if the following opportunities become available in the future:

- Direct potable reuse is permitted and accepted by the community and regulatory agencies;
- Advanced treatment technologies become less expensive, more efficient, or both; and
- Partners are willing to enter into imported water exchange agreements.

The Water Master Plan Will Be Monitored and Updated

The Water Master Plan recognizes that baseline supplies and infrastructure are subject to change. Therefore, the long-term strategy will be updated every five years following preparation of the Urban Water Management Plan to capture updated supply and demand projections, as well as changes in groundwater basin management objectives. This water management planning cycle is illustrated in Figure 14. The implementation plan will be reviewed annually over the next five years to ensure that the recommendations are still valid, and to ensure that all Water Master Plan projects and programs are budgeted, planned, and completed at the appropriate times. The District will report on progress annually, and will measure success using performance measures and milestones.

Figure 14. Water Resources Planning Cycle



The Water Master Plan recognizes that completion of baseline projects and programs such as the BDCP and FAHCE implementation, and many other circumstances such as water reuse regulations, can significantly affect the Water Master Plan strategy. Additionally, new issues will likely arise over the planning horizon. The plan will be updated every five years to address any changed and new circumstances. Periodic plan updates will allow the District to address any new or changed circumstances and to adjust its water supply strategy to fit the needs of the county in the future.

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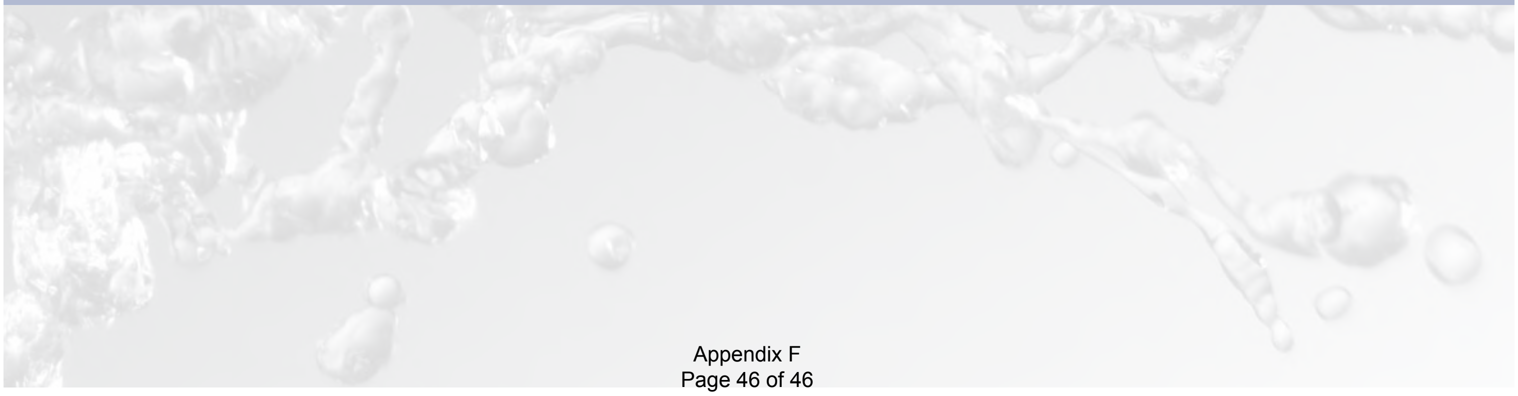
Santa Clara Valley
Water District

Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686
Phone: (408) 265-2600
Fax: (408) 266-0271
www.valleywater.org



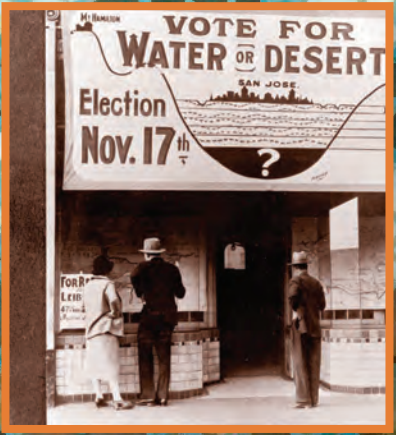
Groundwater Management Plan

Appendix G

Santa Clara Valley
Water District

2012

Groundwater Management Plan



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2012
Groundwater Management Plan

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Prepared Under the Direction of:
Beau Goldie
Chief Executive Officer

Jim Fiedler
Chief Operating Officer, Water Utility Enterprise

Joan Maher
Deputy Operating Officer, Water Supply Division

Behzad Ahmadi
Unit Manager, Groundwater Monitoring and Analysis Unit

Contributors:
Chanie Abuye
Randy Behrens
George Cook
Vanessa De La Piedra
Ellen Fostersmith
Barbara Judd
Yaping Liu
John McHugh
Eric Olson
Xiaoyong Zhan

Graphic Design:
Customer Relations and Graphic Services
Joy O. Lim
Mala Magill

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2012 GROUNDWATER MANAGEMENT PLAN

Executive Summary

The Santa Clara Valley Water District (District) is the groundwater management agency for the Santa Clara and Llagas Subbasins in Santa Clara County. The District is also the primary water wholesaler, flood manager, and watershed steward for the county. Nearly half of the water used in the county is pumped from groundwater, with some communities relying solely on groundwater. The purpose of this 2012 Groundwater Management Plan (GWMP) is to describe basin management objectives, the strategies, programs and activities that support those objectives, and outcome measures to gauge performance.

DISTRICT OVERVIEW

The mission of the District is to provide for a healthy, safe, and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective, and environmentally-sensitive manner for current and future generations.

Local communities have relied on groundwater since the 1850s, when the first wells were drilled to supply water to residents, agriculture, and businesses. By the 1920s, far more water was being pumped than nature could replenish, resulting in declining groundwater levels and permanent land subsidence. The District was formed in 1929 by an act of the California legislature through the Santa Clara Valley Water District Act[1] (District Act) for the purpose of providing comprehensive management for all beneficial uses and protection from flooding within Santa Clara County.

Per Sections 4 and 5 of the District Act, the District’s objectives and authority related to groundwater management are to recharge groundwater basins, conserve, manage and store water for beneficial and useful purposes, increase water supply, protect surface water and groundwater from contamination, prevent waste or diminution of the District's water supply, and do any and every lawful act necessary to ensure sufficient water is available for present and future beneficial uses.

WATER SUPPLY AND GROUNDWATER OVERVIEW

The District’s water supply system is comprised of storage, conveyance, recharge, treatment, and distribution facilities that include local reservoirs, groundwater subbasins, out-of-county groundwater banking, groundwater recharge facilities, treatment plants, imported supply, and raw and treated water conveyance facilities. Santa Clara County’s diverse water supplies include locally developed and managed water, imported water from the Sacramento-San Joaquin Delta, and recycled water.

Since the 1930s, the District’s water supply strategy has been to maximize conjunctive use, the coordinated management of surface and groundwater supplies, to enhance water supply reliability. Local groundwater resources make up the foundation of the county’s water supply, but they need to be augmented by the District’s comprehensive water supply management activities in order to reliably meet the needs of county residents, businesses, agriculture and the environment. These activities include the managed recharge of imported and local supplies and in-lieu groundwater recharge through the provision of treated surface water, acquisition of

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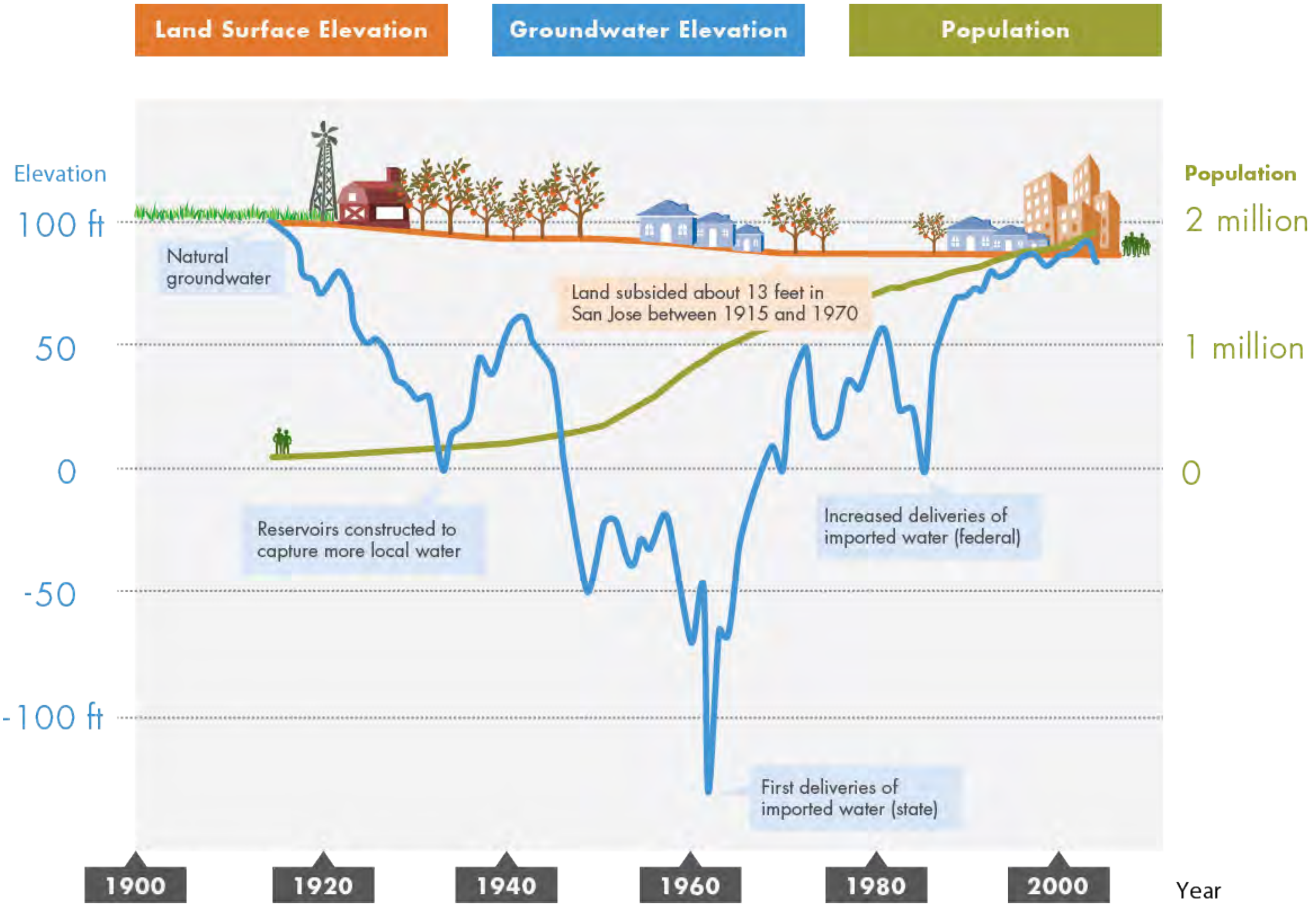
[1] West’s Ann. Cal. Water Code App. §60.

supplemental water supplies, and water conservation and recycling. The District also has programs to protect, manage and sustain water resources.

Figure ES-1 shows how the District's managed recharge programs, imported water deliveries, treated water programs, and other in-lieu recharge have dramatically contributed to a sustainable water supply and have minimized land subsidence in Santa Clara County.

Figure ES-1 History of Groundwater Elevations and Land Subsidence in Santa Clara County



In addition to working to secure adequate water supplies for the county, the District also has a long history of protecting groundwater resources, beginning with efforts to address salt water intrusion adjacent to San Francisco Bay in the late 1950s[2]. In the 1980s, contamination from leaking chemical storage tanks at semiconductor manufacturing facilities brought groundwater quality issues to the forefront. District efforts to aggressively protect groundwater quality have included close coordination with regulatory agencies overseeing cleanup, the implementation of numerous programs including efforts to seal abandoned wells and reduce nitrate loading, the oversight of fuel leak cases, the regulation of wells, and efforts to influence statewide policy from threats such as MTBE, an additive formerly used in gasoline[3].

GROUNDWATER SUBBASINS

Santa Clara County includes portions of two groundwater basins as defined by the California Department of Water Resources (DWR)[4]: the Santa Clara Valley Basin (Basin 2-9) and the Gilroy-Hollister Valley Basin (Basin 3-3). This plan covers only the groundwater subbasins within Santa Clara County managed by the District: the Santa Clara Subbasin (Subbasin 2-9.02) and the Llagas Subbasin (Subbasin 3-3.01), which cover a surface area of approximately 385 square miles (Figure ES-2). Due to different land use and management characteristics, the District further delineates the Santa Clara Subbasin into two groundwater management areas: the Santa Clara Plain and the Coyote Valley.

The groundwater subbasins provide multiple benefits to residents and businesses in Santa Clara County. Although most of the groundwater pumped is a result of District managed recharge programs, the subbasins provide some groundwater supply resulting from the percolation of rainfall in the recharge areas and natural seepage through local creeks and streams. In addition, the groundwater subbasins serve as an extensive conveyance network, allowing water to move from the recharge areas to individual groundwater wells. The groundwater subbasins also provide some natural filtration of surface water as it percolates through the soil and rock. Unlike surface water, most groundwater in the county can be used for drinking water without additional treatment. Lastly, the groundwater subbasins provide water storage, allowing water to be carried over water from the wet season to the dry season and even from wet years to dry years.

Protecting groundwater resources is a key District mission as shown by District Board Supply Objective 2.1.1: “Aggressively protect groundwater from the threat of contamination and maintain and develop groundwater to optimize reliability and to minimize land subsidence and salt water intrusion.”

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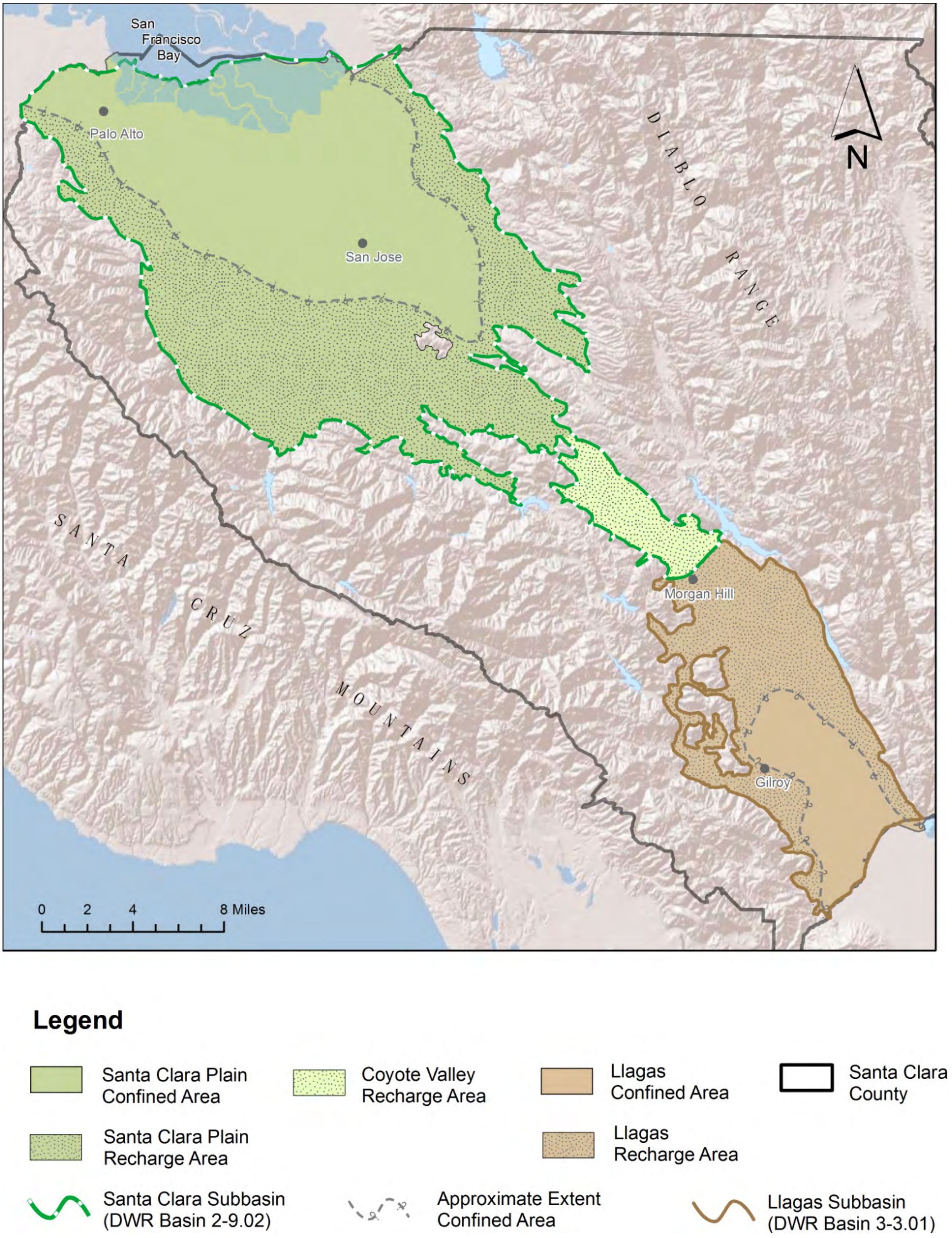
[2] Santa Clara Valley Water District, Saltwater Intrusion Investigation, September 1980.

[3] California History Center & Foundation, Water in the Santa Clara Valley: A History, 2005.

[4] California Department of Water Resources, Bulletin 118, 2003.

Figure ES-2 Santa Clara County Groundwater Subbasins



2012 GROUNDWATER MANAGEMENT PLAN

The District's prior Groundwater Management Plan was published in July 2001 and documented ongoing groundwater management programs. Since that time, SB 1938 and other legislation have amended the requirements for groundwater management plans[5]. Many of these requirements are not applicable for agencies such as the District which have the authority to manage groundwater pursuant to other provisions of law[6]. However, to maintain eligibility for state funding for projects relating to groundwater, certain requirements must be met, including the development of basin management objectives and components relating to the monitoring and management of groundwater and land subsidence.

This 2012 Groundwater Management Plan is prepared under existing groundwater management authority granted by the District Act. The purpose of the 2012 GWMP is to characterize the District's groundwater activities in terms of basin management objectives, strategies, and outcome measures. The 2012 GWMP describes existing and potential management actions to achieve the basin management objectives. Clear documentation of these actions will help the District respond to risks and uncertainties that may impact the quality or quantity of groundwater supplies. These challenges include, but are not limited to, increased demand, regulatory changes, constituents of emerging concern, recharge limitations due to dam restrictions, reduced availability of imported water or other supplies, climate change, and intensified land development. According to the District's 2010 Urban Water Management Plan (UWMP), multiple dry years pose the greatest challenge to the District's water supply as storage reserves (including groundwater storage) are depleted.

The District plans to review the GWMP and update as needed every five years. This schedule will ensure that current information on local groundwater management is available to support the five-year updates of Urban Water Management Plans required by state law. As the next UWMP is scheduled to be completed in 2015, the next review and update of the GWMP will be completed in 2014.

Basin Management Objectives and Strategies

Using the District's overall water supply management objectives, the following basin management objectives (BMOs) were developed:

BMO 1: Groundwater supplies are managed to optimize water supply reliability and minimize land subsidence.

BMO 2: Groundwater is protected from existing and potential contamination, including salt water intrusion.

These BMOs describe the overall goals of the District's groundwater management program. The basin management strategies are the methods that will be used to meet the BMOs. Many of these strategies have overlapping benefits to groundwater resources, acting to improve water supply reliability, minimize subsidence, and protect or improve groundwater quality. The strategies are listed below and are also described in detail in Chapter 3 of this report.

1. Manage groundwater in conjunction with surface water through direct and in-lieu recharge programs to sustain groundwater supplies and to minimize salt water intrusion and land subsidence.
2. Implement programs to protect or promote groundwater quality to support beneficial uses.
3. Maintain and develop adequate groundwater models and monitoring systems.
4. Work with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.

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[5] California Water Code §10753.

[6] California Water Code §1750.2(b)

Basin Management Programs and Activities

The District and local partners have implemented numerous programs to protect groundwater resources that support the basin management objectives and strategies as shown in Tables ES-1 and ES-2 below.

Monitoring Programs

The assessment of groundwater conditions and performance of outcome measures relies on timely, accurate, and representative data. The District has established comprehensive monitoring programs related to groundwater levels, land subsidence, groundwater quality, recharge water quality, and surface water flow, which are described in detail in Chapter 5 of this plan.

Outcome Measures

The District has developed the following outcome measures to gauge performance in meeting the basin management objectives:

1. Projected end of year groundwater storage is greater than 278,000 AF in the Santa Clara Plain, 5,000 in Coyote Valley, and 17,000 AF in the Llagas Subbasin.
2. Groundwater levels are above subsidence thresholds at the subsidence index wells.
3. At least 95% of countywide water supply wells meet primary drinking water standards and at least 90% of South County wells meet Basin Plan agricultural objectives.
4. At least 90% of wells in both the shallow and principal aquifer zones have stable or decreasing concentrations of nitrate, chloride, and total dissolved solids (TDS).

These measures will be assessed annually, based on data for the previous year. The basis for these outcome measures and a description of how they will be measured is presented in Chapter 6 of this plan. If evaluation of the outcome measures indicates poor performance toward meeting a basin management objective, the District will first evaluate potential changes to existing programs and activities prior to considering significant groundwater management changes. Any significant policy or investment decisions would be developed and evaluated in consultation with local stakeholders, as the District does in current planning and budgeting processes as described in Chapter 7 of this plan.

Table ES-1: Relation of Programs and Activities to Basin Management Objectives

Program/Activity	**BMO 1: Water Supply Reliability and Minimization of Land Subsidence**	**BMO 2: Groundwater Quality Protection**
Managed recharge • Reservoirs and diversions (P) • In-stream and off-stream managed recharge (P) • Treated water pilot injection (P) • Treated groundwater reinjection program (P, C)	X	X
In-lieu recharge • Treated water operations (P) • Water conservation (P, C) • Water recycling (P, C, T)	X	X
Protection of natural recharge (P, C, T)	X	
Groundwater production management • Production measurement (P) • Retailer coordination on source shifts and drought response (P, C) • Groundwater charges and zones (P) • Pricing policies (P)	X	
Groundwater level and storage assessment • Operations planning to meet near-term needs (P) • Contingency planning (P) • Long-term water supply planning (P, C)	X	X
Groundwater for emergency backup supply (P, C)	X	
Asset management (P)	X	X
Water system quality requirements (C)		X
Well ordinance program (P)		X
South County private well testing (P)		X
Vulnerability assessment • Groundwater vulnerability studies (P, C) • Drinking Water Source Assessment and Protection (C, T)		X
Coordination with land use agencies • Land use reviews (C, T) • Septic systems (C, T)	X	X
Coordination with regulatory agencies • Contamination release sites (C, T) • Hazardous materials handling and storage oversight (C, T)		X
Public outreach • Outreach materials (P) • School program (P, C) • Groundwater Guardian (P)	X	X
Salt and nutrient management • Salt and Nutrient Management Plans (P, C) • Recycled water irrigation evaluation (P, C)	X	X
Stormwater management (C, T)		X
Salt water intrusion prevention (P)	X	X
Water accounting (P)	X	X
Watershed management (P, C)	X	X

(P) Indicates that the District has primary jurisdiction and/or responsibility; (C) for cooperation or coordination with others; and (T) for providing technical information and/or serving as advocate

Table ES-2: Relation of Programs and Activities to Basin Management Strategies

Program/Activity	Strategy			
	1	2	3	4
Managed recharge • Reservoirs and diversions (P) • In-stream and off-stream managed recharge (P) • Treated water pilot injection (P) • Treated groundwater reinjection program (P, C)	X	X	X	
In-lieu recharge • Treated water operations (P) • Water conservation (P, C) • Water recycling (P, C, T)	X		X	
Protection of natural recharge (P, C, T)			X	X
Groundwater production management • Production measurement (P) • Retailer coordination on source shifts and drought response (P, C) • Groundwater charges and zones (P) • Pricing policies (P)	X	X	X	
Groundwater level and storage assessment • Operations planning to meet near-term needs (P) • Contingency planning (P) • Long-term water supply planning (P, C)	X		X	
Groundwater for emergency backup supply (P, C)	X		X	
Asset management (P)	X	X	X	
Water system quality requirements (C)		X	X	
Well ordinance program (P)		X		X
South County private well testing (P)		X	X	X
Vulnerability assessment • Groundwater vulnerability studies (P, C) • Drinking Water Source Assessment and Protection (C, T)		X	X	X
Coordination with land use agencies • Land use reviews (C, T) • Septic systems (C, T)	X	X		X
Coordination with regulatory agencies • Contamination release sites (C, T) • Hazardous materials handling and storage oversight (C, T)		X		X
Public outreach • Outreach materials (P) • School program (P, C) • Groundwater Guardian (P)	X	X	X	X
Salt and nutrient management • Salt and Nutrient Management Plans (P, C) • Recycled water irrigation evaluation (P, C)		X	X	X
Stormwater management (C, T)	X	X		X
Salt water intrusion prevention (P)	X	X	X	X
Water accounting (P)	X		X	
Watershed management (P, C)		X		X

(P) Indicates that the District has primary jurisdiction and/or responsibility; (C) for cooperation or coordination with others; and (T) for providing technical information and/or serving as advocate

Strategy 1:	Manage groundwater in conjunction with surface water through direct and in-lieu recharge programs to sustain groundwater supplies and to minimize salt water intrusion and land subsidence.
Strategy 2:	Implement programs to protect or promote groundwater quality to support beneficial uses.
Strategy 3:	Maintain and develop adequate groundwater models and monitoring systems.
Strategy 4:	Work with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.

RECOMMENDATIONS

The District’s proactive groundwater management programs and activities have helped to maintain groundwater levels, minimized land subsidence, and improved groundwater protection. To maintain the long-term viability of groundwater resources, the following specific actions are recommended:

1. Maintain existing conjunctive use programs and evaluate opportunities for enhancement or increased efficiency.
2. Continue to aggressively protect groundwater quality through District programs and collaboration with land use agencies, regulatory agencies, and basin stakeholders.
3. Finalize key Water Utility plans.
4. Maintain adequate monitoring programs.
5. Continue and enhance groundwater management partnerships with water retailers and land use agencies.

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1 2012 GROUNDWATER MANAGEMENT PLAN

Introduction

The Santa Clara Valley Water District (District) is the groundwater management agency for the Santa Clara and Llagas Subbasins in Santa Clara County. The District is also the primary water wholesaler, flood manager, and watershed steward for the county. Presently, nearly half of the water used in the county is pumped from groundwater, with some communities relying solely on groundwater. The purpose of this 2012 Groundwater Management Plan (GWMP) is to describe basin management objectives and strategies, programs and activities that support those objectives, and outcome measures to gauge performance.

This chapter provides an overview of the District and the GWMP. It also describes other partners in groundwater management and stakeholder participation in the GWMP.

1.1 DISTRICT OVERVIEW

The mission of the District is to provide for a healthy, safe, and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective, and environmentally-sensitive manner for current and future generations. A sustainable, high-quality water supply is vital for a prosperous economy, the environment, and quality of life in the county.

The District's service area includes all of Santa Clara County, which is located at the southern end of the San Francisco Bay (Figure 1-1). The county encompasses approximately 1,300 square miles, making it the largest of the nine Bay Area counties. The county supports a population of over 1.8 million, although that is projected to increase to over 2.4 million by 2035. The county also provides almost 30% of the Bay Area's jobs[1].

Major topographical features include the Santa Clara Valley, the Diablo Range to the east, Santa Cruz Mountains to the west, San Francisco Bay to the north, and the Pajaro River to the south. The northern part of the valley is extensively urbanized, housing over 90 percent of the county's residents and 13 of the 15 cities. Agriculture is all but gone in the northern valley, with only pockets remaining where there once were numerous orchards. South County remains agricultural and rural, with the exception of the cities of Morgan Hill and Gilroy.

The District manages water resources and wholesales treated water to water retailers within Santa Clara County. For maximum flexibility, the District utilizes a variety of water supply sources including groundwater, local surface water, water imported from the Sacramento-San Joaquin Delta, and recycled water. Water users in the county also rely on Hetch-Hetchy water supplied by the City of San Francisco and sold directly to several water retailers as well as surface water rights held by Stanford University and the San Jose Water Company.

The District manages 10 local reservoirs and water conveyance and distribution facilities. The District also operates three drinking water treatment plants and sells treated water to 7 of the 13 local water retailers that serve communities via their own distribution systems. These activities help sustain groundwater, which provides nearly half the water used in the county each year.

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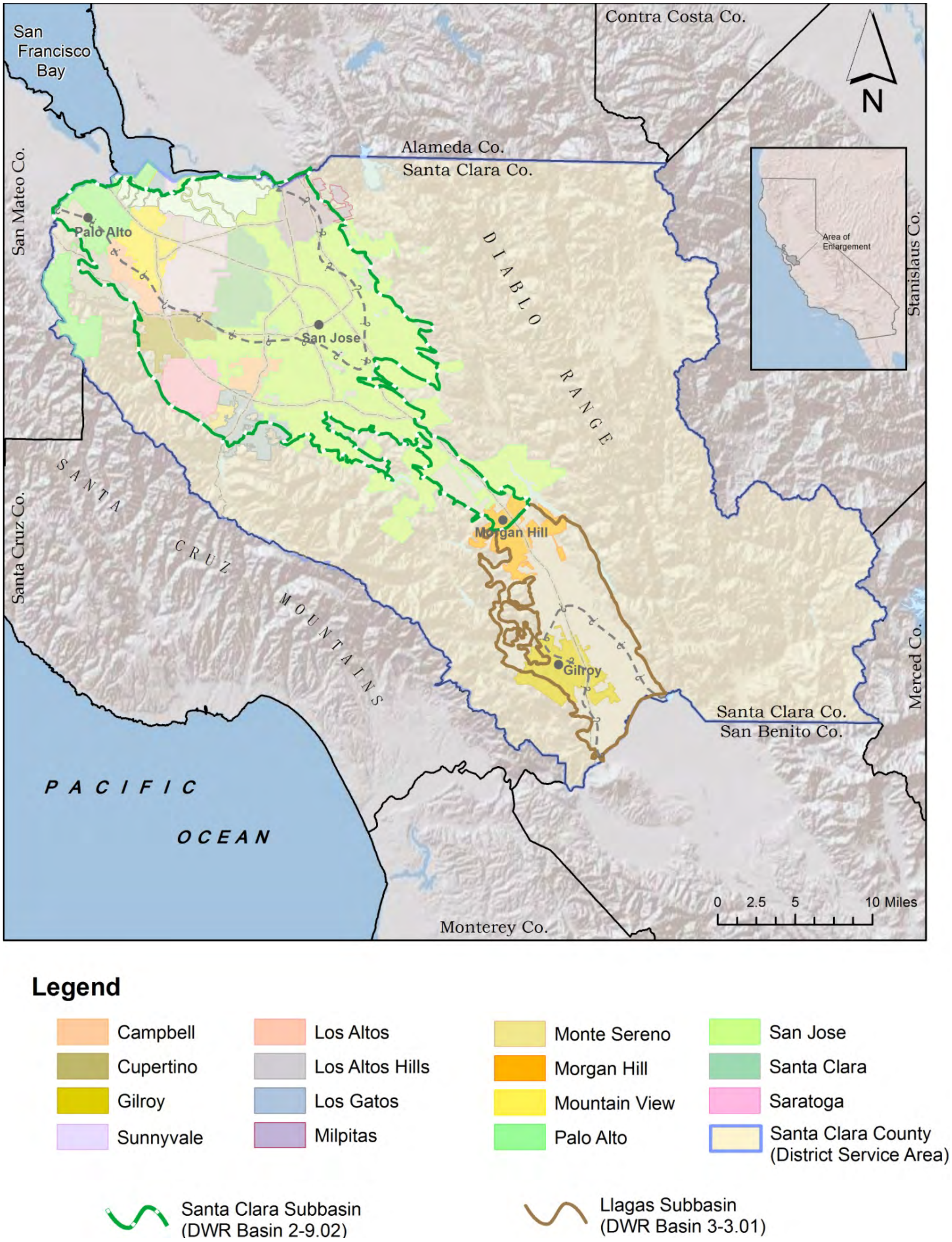
[1] Santa Clara Valley Water District, Urban Water Management Plan, 2010.

Figure 1-1 Santa Clara County Location Map



1.2 DISTRICT HISTORY AND AUTHORITY

Local communities have relied on groundwater since the 1850s, when the first wells were drilled to supply water to residents, agriculture, and businesses. By the 1920s, far more water was being pumped than nature could replenish. This groundwater overdraft resulted in declining groundwater levels and land subsidence, the broad sagging of the land surface over many miles. Mountain View, Sunnyvale, Santa Clara, and north San Jose experienced permanent land subsidence, with the ground surface in downtown San Jose dropping about 13 feet over time. The Santa Clara Valley Water Conservation District, the precursor of today's District, was formed in 1929 by an act of the California legislature, with the mission of managing water resources to stop groundwater overdraft and land subsidence.

The District has been a leader in conjunctive use (the coordinated use of surface water and groundwater) since the 1930s. Initially, the District supplemented natural groundwater recharge through the managed recharge of local supplies. As the county continued to grow, so did the variety of managed groundwater recharge sources and methods. When local surface water supplies could no longer meet the growing county's needs, the District turned to imported water for recharge, then to in-lieu recharge through treated water deliveries. More recently, the District has implemented water conservation programs and is working to expand water recycling as part of its integrated water resources management approach.

In addition to working to secure adequate water supplies for the county, the District also has a long history of protecting groundwater resources, beginning with efforts to address salt water intrusion adjacent to San Francisco Bay in the late 1950s[2]. In the 1980s, groundwater contamination from leaking chemical storage tanks at the IBM and Fairchild sites brought groundwater quality issues to the forefront. District efforts to aggressively protect groundwater quality have included close coordination with regulatory agencies overseeing cleanup, the implementation of numerous programs including efforts to seal abandoned wells and reduce nitrate loading, the oversight of fuel leak cases, the regulation of wells, and efforts to influence statewide policy from threats such as MTBE, an additive formerly used in gasoline[3]. A more detailed history related to the District and groundwater is presented in Appendix A.

The District was formed by the Santa Clara Valley Water District Act[4] (District Act) for the primary purpose of providing comprehensive management for all beneficial uses and protection from flooding within Santa Clara County. Per Sections 4 and 5 of the District Act, the District's objectives and authority related to groundwater management are to recharge groundwater basins, conserve, manage and store water for beneficial and useful purposes, increase water supply, protect surface and groundwater from contamination, prevent waste or diminution of the District's water supply, and do any and every lawful act necessary to ensure sufficient water is available for present and future beneficial uses.

The District Act gives the District's Board of Directors (Board) the authority to adopt ordinances to carry out the District's authority under the District Act, including its authority to protect the county's groundwater resources. One such ordinance regulates the construction and destruction of wells and other deep excavations[5]. The District Act also provides the District with the authority to levy groundwater charges and to use those revenues to pay for the cost of constructing, maintaining and operating facilities that import water into the county, the costs of imported water, and the cost of constructing, maintaining and operating facilities which will conserve or distribute water within

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[2] Santa Clara Valley Water District, Saltwater Intrusion Investigation, September 1980.

[3] California History Center & Foundation, Water in the Santa Clara Valley: A History, 2005.

[4] Santa Clara Valley Water District Act, Water Code Appendix, Chapter 60.

[5] Santa Clara Valley Water District Ordinance 90-1.

groundwater zones, including facilities for groundwater recharge, surface distribution, and the purification and treatment of such water.

1.3 PARTNERS IN GROUNDWATER MANAGEMENT

Although the District is the groundwater management agency in Santa Clara County per the District Act, many other agencies have significant roles, including local water retailers, land use agencies, and regulatory agencies.

Local water retailers maintain facilities to distribute water directly to their customers and are responsible for meeting applicable regulatory standards established by the U.S. Environmental Protection Agency (USEPA) and California Department of Public Health (CDPH). In addition to groundwater, local retailers may also serve treated water purchased from the District or potable water supplied by the City of San Francisco. Several retailers also maintain local surface water rights and distribute recycled water for non-potable uses. The maintenance of these supplies is critical to maintaining overall water supply reliability in the county. Every five years, the District and local water retailers coordinate to develop individual agencies' Urban Water Management Plans that evaluate water supply reliability over a 20 year period. For water retailers using groundwater, these plans show a continued reliance on groundwater in the future.

Land use agencies, including Santa Clara County and local cities, provide land use planning and permitting functions that play a role in water demand and land use decisions which may impact groundwater quality and recharge. General Plans adopted by land use agencies reflect each agency's policy with regard to future development and many of these plans contain goals to address water supply reliability and the protection of water resources, including groundwater. Land use agencies also permit and inspect hazardous material and waste storage and handling facilities through the fire departments. The Santa Clara County Department of Environmental Health also oversees the leaking underground fuel tank cleanup program, issues permits for septic systems, and regulates drinking water systems with 5 to 14 connections. Local land use agencies also administer stormwater management programs in compliance with National Pollutant Discharge Elimination System (NPDES) requirements.

The District relies on partnerships with regulatory agencies to protect groundwater resources. Agencies including the State Water Resources Control Board, the Department of Toxic Substances Control (DTSC), and the USEPA regulate the cleanup of contaminants in groundwater. Regional Water Quality Control Boards (Water Boards) also define the beneficial uses and water quality objectives for groundwater basins. Two Water Boards have regulatory jurisdiction over water resources in Santa Clara County, the San Francisco Regional Water Board and the Central Coast Water Board.

Figure 1-2 shows the general authorities, roles, and functions of these various agencies with regard to groundwater resources. It should be noted that this figure is intended to provide a general overview rather than a comprehensive list of individual agencies and functions.

Private well owners and the public are also important partners in protecting groundwater supplies. Private well owners are responsible for constructing, maintaining, and properly destroying wells so they do not act as vertical pathways for contaminants. The community also has a role in protecting groundwater supplies by using water wisely and helping reduce the introduction of contaminants from activities at the land surface.

There are also numerous statewide and national organizations engaged in issues related to groundwater, including the Association of California Water Agencies and the California Urban Water Agencies. The District works with these agencies and others on various proposals to protect groundwater resources.

Figure 1-2 Overview of Groundwater Management Roles

U.S. Environmental Protection Agency

Safe Drinking Water Act** | **Comprehensive Environmental Response, Compensation and Liability Act

- Establishes federal drinking water standards for public water systems
- Regulates cleanup of Superfund sites

California Environmental Protection Agency

Includes: Department of Toxic Substances Control | State Water Resources Control Board | Regional Water Quality Control Boards

California Water Code** | **Resource Conservation and Recovery Act** | **California Health and Safety Code

- Develops and implements environmental protection laws that ensure clean air, clean water, clean soil, safe pesticides and waste recycling and reduction
- Allocates water rights and adjudicates water right disputes
- Develops statewide water protection plans and establishes water quality standards
- Regulates facilities that treat, store, and dispose of hazardous waste
- Regulates cleanup of contaminated sites

California Department of Water Resources

California Water Code

- Guides development and management of water resources
- Operates the State Water Project
- Supports local and regional water management through technical and financial assistance.

California Department of Public Health

California Code of Regulations

- Establishes state drinking water standards and regulates public drinking water systems
- Permits recycled water projects

Santa Clara Valley Water District

Santa Clara Valley Water District Act

- Manages the Santa Clara and Llagas Subbasins in Santa Clara County
- Implements programs to protect and augment groundwater
- Conducts managed recharge and in-lieu recharge programs to offset groundwater pumping
- Permits wells and other deep excavations
- Operates and maintains water storage, treatment, distribution, and recharge facilities

Land Use Agencies

City Charters and Other Authorities

- Develop General Plans
- Permit land use and administer stormwater management programs
- Permit hazardous material storage and handling facilities
- Oversee the cleanup of leaking underground tanks (County)
- Regulates septic systems and small water systems (County)

Water Retailers

- Maintain facilities to deliver water to customers
- Ensure compliance with drinking water standards
- May maintain surface water rights or other sources of supply

Well Owners and the Community

- Responsible for maintaining, constructing, and properly destroying wells (well owners)
- Help protect groundwater by using water wisely and minimizing the introduction of contaminants

1.4 REPORT CONTENT AND ORGANIZATION

This 2012 GWMP brings together important information on groundwater management objectives, strategies, and related activities in Santa Clara County. The GWMP is intended to present information that will be useful to water retailers, land use planning agencies, cities, and community members interested in groundwater in Santa Clara County. The 2012 GWMP includes the following chapters:

Chapter 2 Water Supply System: This chapter provides an overview of the county's water supply system and groundwater subbasins.

Chapter 3 Basin Management Objectives and Strategies: This chapter describes the basin management objectives and strategies as well as their relationship to District policy.

Chapter 4 Basin Management Programs and Activities: This chapter describes District programs and activities that support the basin management objectives and strategies.

Chapter 5 Monitoring Programs and Protocols: This chapter summarizes District programs to monitor changes in groundwater levels, groundwater quality, land subsidence, and surface water.

Chapter 6 Outcome Measures: This chapter identifies specific outcomes to measure the effectiveness of basin management strategies and related programs in meeting the basin management objectives.

Chapter 7 Next Steps: This chapter describes future reporting related to the GWMP and discusses potential approaches to consider if the outcome measures indicate improvement is needed or to address future risks and changing conditions. It also includes recommendations for further work.

1.5 2012 GROUNDWATER MANAGEMENT PLAN

The District's prior Groundwater Management Plan was published in July 2001 and documented ongoing groundwater management programs. Since that time, SB 1938 and other legislation have amended the requirements for groundwater management plans[6]. Many of these requirements are not applicable for agencies such as the District which have the authority to manage groundwater pursuant to other provisions of law[7]. However, to maintain eligibility for state funding for projects relating to groundwater, certain requirements must be met, including the development of basin management objectives and components relating to the monitoring and management of groundwater and land subsidence.

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[6] California Water Code §10753.

[7] California Water Code §10750.2(b)

This 2012 Groundwater Management Plan is prepared under existing groundwater management authority granted by the District Act. The purpose of the 2012 GWMP is to characterize the District's groundwater activities in terms of basin management objectives, strategies, and outcome measures. Benefits of preparing the 2012 GWMP include the:

- Development of clear basin management objectives that support the District mission and policies
- Documentation of the benefits of existing groundwater management programs and how they support basin management objectives and strategies
- Identification of potential actions that may be needed to achieve those objectives or respond to risks and changing conditions
- Ability to prioritize existing and future activities based on outcome measures
- Continued eligibility for funds administered by the California Department of Water Resources (DWR) for groundwater projects

The 2012 GWMP will describe existing and potential management actions to achieve basin management objectives. Clear documentation of these actions will help the District respond to risks and uncertainties that may impact the quality or quantity of groundwater supplies. These challenges include, but are not limited to, droughts, increased water demand, regulatory changes, contaminants of emerging concern, groundwater recharge limitations due to dam restrictions, reduced availability of imported water or other supplies, climate change, and intensified land development.

Basin Management Objectives

District Board of Directors Policy with regard to groundwater is reflected in Board Water Supply Objective 2.1.1: "Aggressively protect groundwater from the threat of contamination and maintain and develop groundwater to optimize reliability and to minimize land subsidence and salt water intrusion." In accordance with the District Act and this policy, the District has identified the following basin management objectives (BMO):

BMO 1: Groundwater supplies are managed to optimize water supply reliability and minimize land subsidence.

BMO 2: Groundwater is protected from existing and potential contamination, including salt water intrusion.

These basin management objectives, as well as the strategies to achieve them are described in detail in Chapter 3 of this report. Related programs and activities, monitoring, and outcome measures are described in Chapters 4 through 6.

Relation to Other District Studies

The 2012 GWMP provides information on basin conditions and operational considerations and documents groundwater management objectives, strategies and related activities. This information supports other District planning efforts including annual operations plans and other District efforts including the:

- Annual Protection and Augmentation of Water Supplies Report, which provides information on present and future water supply requirements and availability, discusses programs needed to sustain reliability, and presents the basis for recommended groundwater production charges in accordance with the District Act
- Urban Water Management Plan (UWMP) that evaluates water supply reliability over a 25-year period

- Salt and Nutrient Management Plan that assesses the loading of salt and nutrients to groundwater and identifies related management strategies
- Water Supply and Infrastructure Master Plan (Water Master Plan) that documents the District's strategy for ensuring long-term water supply reliability by specifying the needed water supplies to ensure a reliable water supply, identifying future infrastructure capacity needs, and defining operating strategies
- Planning to address specific water management issues, such as the San Luis Low Point Improvement Project and emergency operations planning in the Infrastructure Reliability Project, which could affect future groundwater management

The District plans to update the Groundwater Management Plan every five years, prior to updates of the Urban Water Management Plan, which is also on a five-year update cycle. The GWMP provides information on groundwater conditions and operational considerations, which are critical inputs to the UWMP in the evaluation of future water supply conditions. The Water Master Plan, which is also on a five-year update cycle, builds on the information in the both the GWMP and UWMP to update the District's long-term water supply strategy.

Water Code Components

In September 2002, SB 1938 was signed into law, modifying Section 10753 of the Water Code. Section 10753 states any local agency overlying all or part of a groundwater basin may by ordinance or resolution adopt and implement a groundwater management plan, unless the groundwater basin is being managed pursuant to other provisions of law or a court order, judgment, or decree. The District is the groundwater management agency for the Santa Clara and Llagas Subbasins as established by the District Act and the 2012 GWMP is prepared pursuant to its authority under the District Act. Therefore, many of the requirements of Water Code Section 10753 do not apply to the District's GWMP. However, to continue to be eligible for funds administered by DWR for groundwater projects, the District will adhere to certain portions of California Water Code Section 10753.7 that describe the mandatory components of a groundwater management plan that are required to maintain eligibility for state funding. Water Code Section 10753.8 also identifies several optional components for groundwater management plans. Table 1-1 below presents the mandatory and voluntary plan components and identifies where they can be found in the 2012 GWMP.

Table 1-1 Required and Voluntary Groundwater Management Plan Components

GWMP Required Components (Water Code Section 10753.7)	2012 GWMP Section
Prepare and implement basin management objectives	3, 6, 7
Include components relating to the monitoring and management of groundwater levels, groundwater quality degradation, inelastic land surface subsidence, and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping	4, 5, 6
Include a description of how recharge areas identified in the plan substantially contribute to the replenishment of the groundwater basin	2.1, 2.3
Prepare a plan that enables the local agency to work cooperatively with other public entities	1.6, 4
Prepare a map that details the area of the groundwater basin, as defined in DWR Bulletin 118, and the area of the local agency, as well as the boundaries of other local agencies that overlie the basin in which the agency is developing a groundwater management plan	1.1, 2.3
Include a map identifying the recharge areas for the groundwater basin and provide this map to appropriate local planning agencies after adoption of the plan	2.3
Adopt monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence, and surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin	5
If located outside the groundwater basins as delineated in Bulletin 118, shall use geologic and hydrologic principles appropriate to those areas	NA

GWMP Voluntary Components (Water Code Section 10753.8)	2012 GWMP Section
Control of saline water intrusion	2.3, 4.3, 3
Identification and management of wellhead protection areas and recharge areas	2.3, 4.2
Regulation of the migration of contaminated groundwater	1.5, 4.2
The administration of a well abandonment and well destruction program	4.2, 4.3
Mitigation of conditions of overdraft	2, 4.1, 3, 7
Replenishment of groundwater extracted by water producers	2.2, 4.1, 3, 7
Monitoring of groundwater levels and storage	4.1, 5, 6, 7
Facilitating conjunctive use operations	2, 3, 4.1, 6, 7
Identification of well construction policies	4.2.2
Construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects	2, 4
The development of relationships with state and federal regulatory agencies	1.5, 1.6, 4, 7
Review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination	1.6, 4.2, 4.3

1.6 PUBLIC OUTREACH FOR THE 2012 GWMP

The California Water Code describes the process for development and adoption of a groundwater management plan that includes public participation. A public hearing on the 2012 GWMP was held at a regularly-scheduled Board meeting and public notice for this hearing included advertisements in local newspapers and the posting of the draft 2012 GWMP on the District website. This publicly-noticed hearing and posted website information provided opportunities for public participation in the development and adoption of the 2012 GWMP. Notices, environmental documentation, and the Board resolution related to the 2012 GWMP are included in Appendix B.

In addition to the publicly-noticed hearing, the District presented information on the development of the GWMP at several meetings of the Water Retailers Groundwater Subcommittee, which includes representatives from local water retailers that depend on groundwater. The GWMP was included as an agenda item for discussion in March 2009, January 2012, and April 2012. Members of the Groundwater Subcommittee were also provided with a copy of the draft GWMP and were given an opportunity to provide feedback prior to finalizing the report.

A map showing the location of groundwater recharge areas will be provided to local land use agencies following adoption of the GWMP. The District will continue to work closely with local partners and the public using the following methods:

- Regularly scheduled meetings, including the Water Retailer Groundwater Subcommittee and publicly-noticed Board meetings
- Review and coordination with land use agencies on land use and development proposals as well as the development of guidelines related to specific issues (e.g., stormwater infiltration, graywater, septic systems)
- Technical coordination with regulatory agencies on contaminant release sites and policies related to groundwater
- Coordination with basin stakeholders and regulatory agencies on long-term resource planning efforts such as the Salt and Nutrient Management Plan
- Outreach including the development of fact sheets and web information and interaction with the public at open houses and other events

2 2012 GROUNDWATER MANAGEMENT PLAN
Water Supply Overview

The District carefully manages groundwater as part of a comprehensive water management network that includes various supplies and management tools. Groundwater management is not an isolated activity, but rather an integrated part of the District's overall water resources management system.

This chapter provides an overview of the county's water supply system and management, and describes the Santa Clara and Llagas Subbasins. The overview presented in this chapter provides important information to understand the basin management objectives, strategies, and related programs that are presented in later chapters.

2.1 WATER SUPPLY SOURCES

In order to meet the county's water needs while maintaining maximum efficiency and flexibility, the District utilizes a variety of water supply sources. The District's water supply system is comprised of storage, conveyance, recharge, treatment, and distribution facilities that include local reservoirs, groundwater subbasins, out-of-county groundwater banking, groundwater recharge facilities, treatment plants, imported supply, and raw and treated water conveyance facilities. Santa Clara County's diverse water supplies include locally developed and managed water, imported water, and recycled water.

Local Supplies

The District captures rainfall and runoff in 10 local reservoirs and has numerous water rights to divert and store local surface water from creeks and streams. Captured local surface water is used to replenish the groundwater subbasins through an actively managed recharge program and provides supply for the District's drinking water treatment plants. Appendix C contains more detailed information on District reservoirs and recharge facilities. Several water retailers also maintain local surface water rights.

Local groundwater subbasins provide some water supply from the deep infiltration of rainfall, but the amount of groundwater pumped far exceeds this natural groundwater yield. The county's groundwater subbasins serve several important functions in that they transmit, filter, and store water. Water from the District's managed recharge program and rainfall enters the subbasins through recharge areas and undergoes natural filtration as it is transmitted into deeper aquifers. This recharge replaces water pumped by groundwater users and helps avoid land subsidence. Storing surplus water in the groundwater subbasins enables part of the county's supply to be carried over from wet years to dry years. Because the groundwater subbasins are able to store the largest amount of local reserves, the District depends on maintaining adequate groundwater to get through extended dry periods or other outages[1].

A small, but important and growing source of water is recycled water, which is used for non-potable uses including irrigation, industry, and agriculture. Using recycled water helps conserve drinking water supplies, provides a drought-proof, locally-controlled water supply and reduces dependency on imported water and groundwater. The District has established partnerships with the four recycled water producers in the county to expand recycled water use.

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[1] Santa Clara Valley Water District, Urban Water Management Plan, 2010.

Imported Supplies

Half of the county's water supply comes from hundreds of miles away - first as snow or rain in the Sierra Nevada range, then as water in rivers that flow into the Sacramento-San Joaquin Delta or directly to water conveyance systems. Imported water is brought into the county through the complex infrastructure of the State Water Project (SWP), the federal Central Valley Project (CVP), and San Francisco's Hetch Hetchy system. The District purchases water under long-term contracts, short-term water transfers, and water exchanges. The most significant imported water contracts include those with the SWP and CVP. The District also has a long-term agreement with the Semitropic Groundwater Storage Program to store water in the Kern County groundwater basin for future use. This out-of-county banking provides the District with additional flexibility to divert some of its imported supplies in wet years for use in years when it is needed, such as during multi-year droughts or other supply shortages. The Semitropic Water Bank is an exchange program, meaning that the District does not take groundwater directly from the groundwater basin at Semitropic. Rather, the District receives its water by exchanging its banked water with other SWP water pumped from the Delta. Imported water is sent to the District's three water treatment plants, directly to the recharge ponds or creeks, or to local reservoirs for later release to supplement groundwater recharge.

Eight local water retailers in the northern portions of the county receive imported water directly from the San Francisco Public Utility Commission (SFPUC) Hetch Hetchy system: Milpitas, San Jose Municipal Water System, Santa Clara, Sunnyvale, Palo Alto, Mountain View, Stanford, and the Purissima Hills Water District (serving Los Altos Hills). The District and SFPUC have also constructed an intertie that allows for the exchange of water between the two systems in the event of a facility failure or outage in either system, either planned or unplanned.

Average water supply use and supplies for both North County and South County are shown below in Figures 2-1 and 2-2, respectively. As shown in Figure 2-1, Hetch Hetchy imports account for nearly 20 percent of the water supply in North County. Water imported by the District through the SWP and CVP and used for groundwater recharge provides 36% of North County groundwater used. The District's imported water supplies also provide 86% of the water used at water treatment plants. In South County, the District's imported supplies provide 26% of the groundwater water used. An interruption or outage of Hetch Hetchy or other imported supplies could have significant impacts on the county's water supply reliability.

2.2 CONJUNCTIVE USE

Nearly half of the water used in Santa Clara County is pumped from groundwater, one of the county's greatest natural resources. The District was initially formed to stop groundwater overdraft and land subsidence and preventing the recurrence of these conditions remains a key driver for water supply management. Since the 1930s, the District's water supply strategy has been to maximize conjunctive use, the coordinated management of surface and groundwater supplies, to enhance water supply reliability. Local groundwater resources make up the foundation of the county's water supply, but they need to be augmented by the District's comprehensive water supply management activities in order to reliably meet the needs of county residents, businesses, agriculture and the environment. These activities include the managed recharge of imported and local supplies, in-lieu groundwater recharge through the provision of treated surface water and acquisition of supplemental water supplies, and programs to protect, manage and sustain water resources.

Managed Recharge

The District's managed recharge program uses both runoff captured in local reservoirs and imported water delivered by the raw water conveyance system to recharge groundwater through more than 390 acres of recharge ponds and over 90 miles of local creeks. Between 2009 and 2011, the District recharged an average of 100,000 AF of local and imported water each year[2]. As shown in Figures 2-1 and 2-2, the managed recharge of District imported water and water stored in local reservoirs accounts for the majority of groundwater used in the county. The District's managed recharge facilities are shown in Figure 2-3 and a more detailed description of the District's managed recharge facilities can be found in Appendix C.

Recharge capacity can be viewed as processing capacity, meaning that surface water recharged through surface spreading is filtered by the soils and distributed to groundwater extraction facilities through the groundwater subbasins; much like water is treated by water treatment plants and distributed to the retailers through the District's distribution pipelines.

Maintaining the District's active managed recharge program requires ongoing operational planning for the distribution of local and imported water to recharge facilities; maintenance and operation of reservoirs, diversion facilities, distribution systems, and recharge ponds; and the maintenance of water supply contracts, water rights, and relevant environmental permits.

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[2] Santa Clara Valley Water District, Protection and Augmentation of Water Supplies Report, February 2012.

Figure 2-1 North County Water Supply and Use (2006-2010)

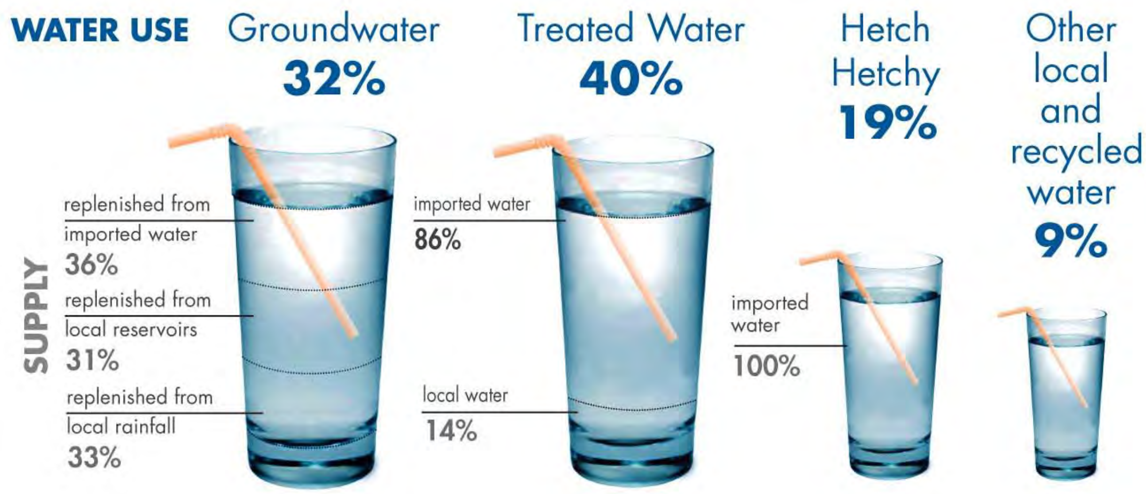


Figure 2-2 South County Water Supply and Use (2006-2010)

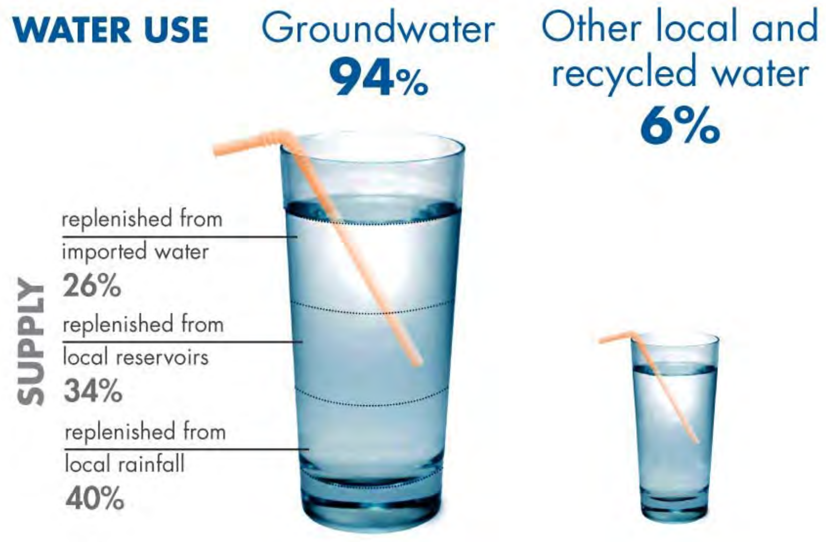
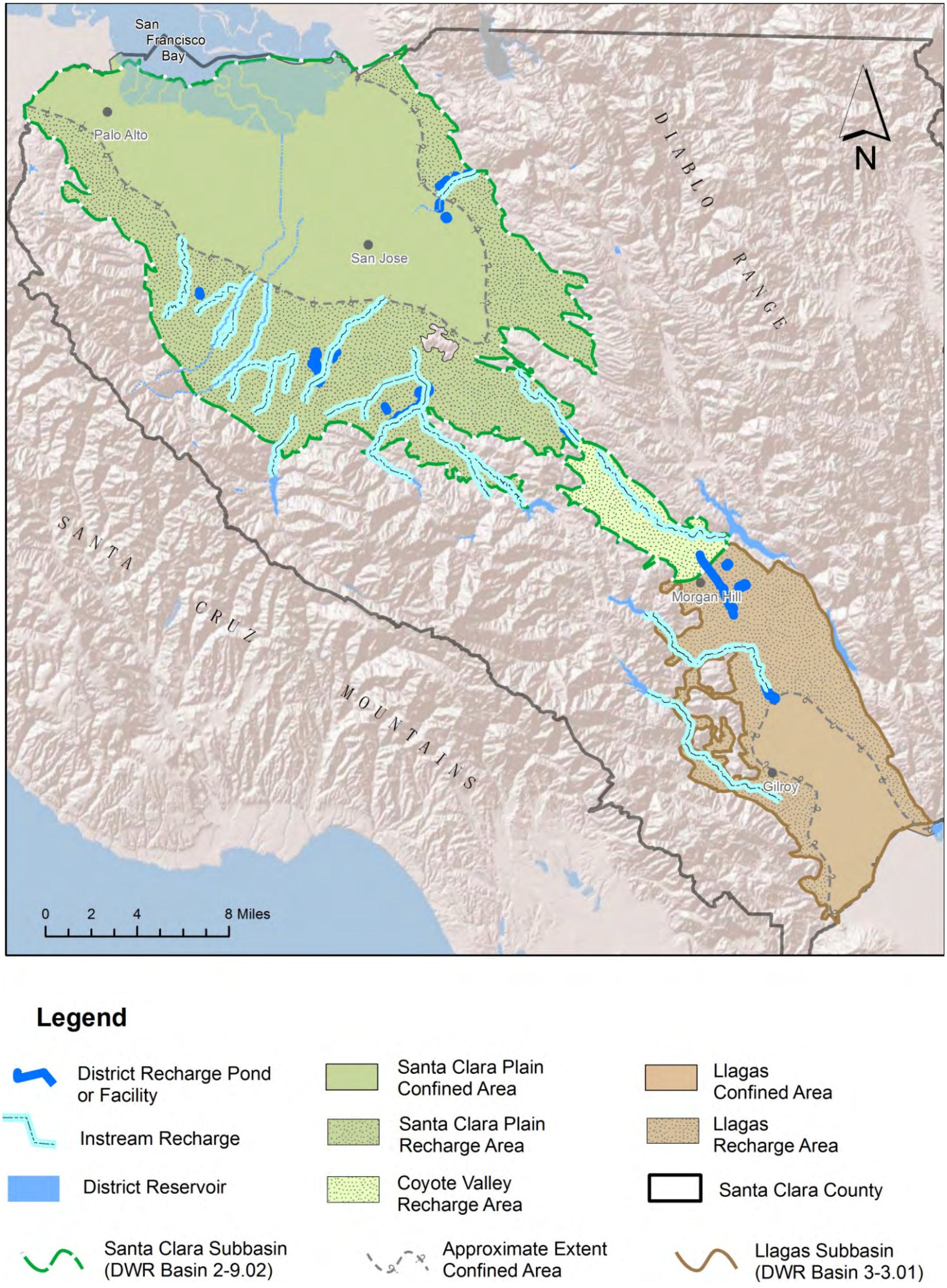


Figure 2-3 District Managed Recharge Facilities



In-Lieu Recharge

Just as important as managed recharge are the District's in-lieu recharge programs, including treated water deliveries, water recycling, and water conservation. These activities indirectly help keep groundwater supplies from diminishing and the land from subsiding by reducing demands on the groundwater subbasins. By meeting demands that would otherwise be met by groundwater, these programs provide in-lieu recharge as if the groundwater subbasins had been recharged by that amount.

The District owns and operates three water treatment plants and distributes the treated surface and imported water to 7 of the 13 water retailers through the District's treated water distribution system. These treatment plants have a combined treatment processing rate of over 200 million gallons per day, reducing groundwater pumping needs in the northern Santa Clara Valley.

The District encourages recycled water development in the county through partnerships with the local wastewater agencies and through financial incentives and technical assistance. An estimated 15,000 AF of recycled water was used in 2011, offsetting demands that might otherwise have been met through other potable supplies such as additional groundwater pumping. Similarly, in fiscal year 2011, the District's water conservation program saved an estimated 52,500 AF of water.

Benefits of Conjunctive Use Programs

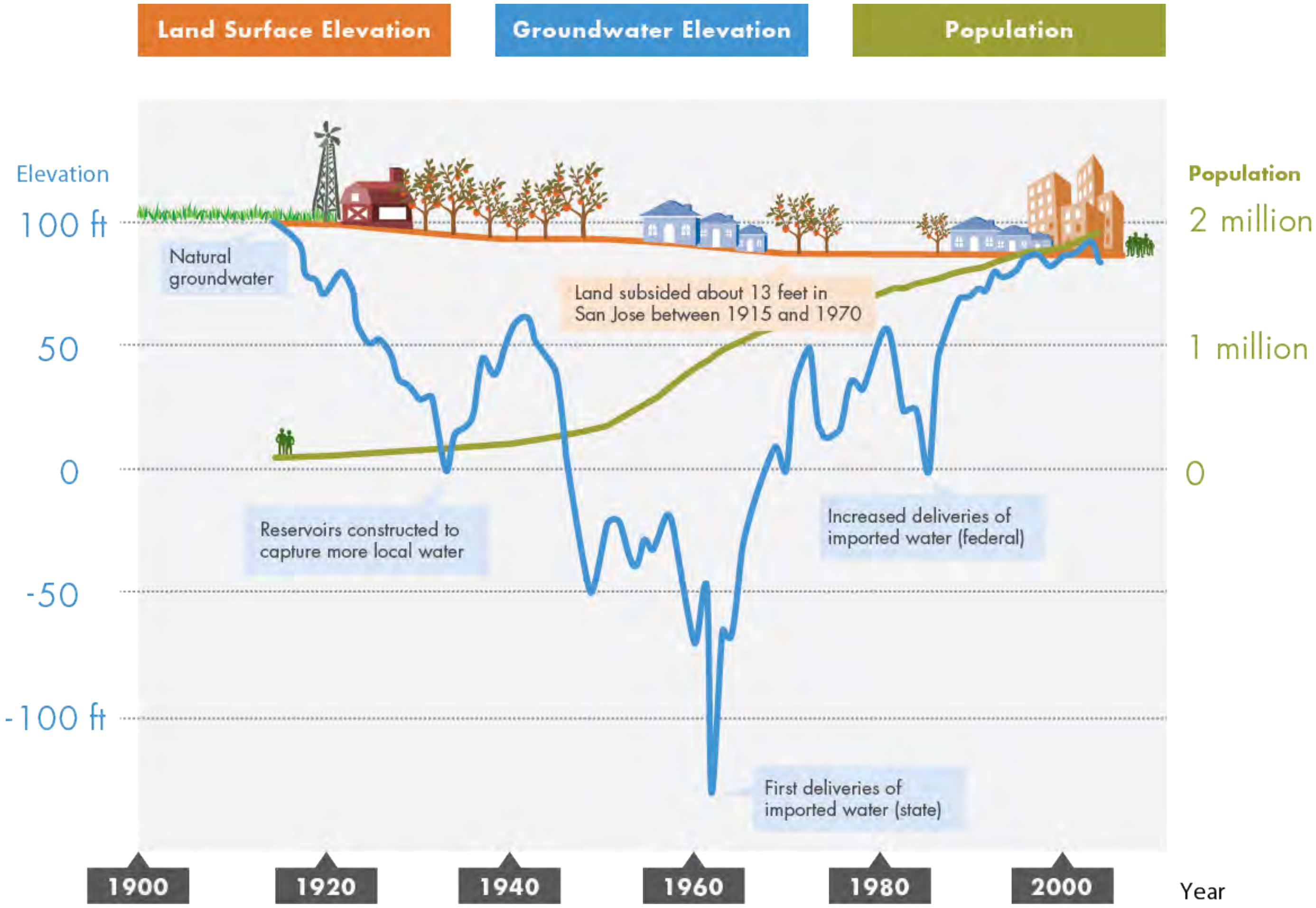
Without the District's conjunctive use programs, groundwater elevations would be considerably lower than they are today, reducing water supply reliability and increasing the risks of continued land subsidence and salt water intrusion. Figure 2-4 illustrates the history of groundwater elevations and land subsidence in Santa Clara County and the role of District water management programs in maintaining groundwater elevations and reducing the rate of land subsidence. This figure shows several time periods with steep declines in groundwater levels due to significant increases in population and overreliance on groundwater. However, the construction of reservoirs for groundwater recharge and the importation of water resulted in the significant recovery of groundwater levels following these actions. The figure also depicts the long-term and permanent effects of land subsidence.

2.3 GROUNDWATER SUBBASINS

This section provides an overview of the Santa Clara and Llagas Subbasins. A more detailed description can be found in Appendix D.

The groundwater subbasins provide multiple benefits to residents and businesses in Santa Clara County. As shown in Figures 2-1 and 2-2, most of the groundwater pumped is a result of District recharge programs using imported water and water stored in District reservoirs. The subbasins also provide some groundwater supply resulting from the percolation of rainfall in the recharge areas and natural seepage through local creeks and streams. In addition, the groundwater subbasins serve as an extensive conveyance network, allowing water to move from the recharge areas to individual groundwater wells. The groundwater subbasins also provide some natural filtration of surface water as it percolates through the soil and rock. Unlike surface water, most groundwater in the county can be used for drinking water without additional treatment. Lastly, the groundwater subbasins provide water storage, allowing water to be carried over from the wet season to the dry season and even from wet years to dry years.

Figure 2-4 History of Groundwater Elevations and Land Subsidence in Santa Clara County



Santa Clara County includes portions of two groundwater basins as defined by the California Department of Water Resources (DWR)[3]: the Santa Clara Valley Basin (Basin 2-9) and the Gilroy-Hollister Valley Basin (Basin 3-3). This plan covers only the groundwater subbasins within Santa Clara County managed by the District: the Santa Clara Subbasin (Subbasin 2-9.02) and the Llagas Subbasin (Subbasin 3-3.01), which cover a surface area of approximately 385 square miles (Figure 2-5). Due to different land use and management characteristics, the District further delineates the Santa Clara Subbasin into two management areas: the Santa Clara Plain and the Coyote Valley. As shown in Figure 2-5, there are some minor discrepancies in the subbasin boundaries as shown by DWR and the District. District staff is working with DWR to resolve these minor differences and update the subbasin boundaries for the county to reflect the most current knowledge of the subbasins.

Both the Santa Clara and Llagas Subbasins are divided into confined and recharge areas. Within confined areas, laterally extensive low permeability clays and silts (confining units or aquitards) divide upper and lower aquifers. The District refers to these as the shallow and principal aquifers, with the latter defined as aquifer materials greater than 150 feet below ground surface. Confining units impede the vertical flow of groundwater, causing principal aquifers to be under pressure. By restricting the movement of contaminants, confining units also provide some natural protection to principal aquifers. Recharge areas are primarily comprised of high permeability aquifer materials like sands and gravels that allow surface water to infiltrate into the aquifers. Most groundwater recharge occurs in these areas through the infiltration of precipitation and the District's managed recharge to augment groundwater supplies.

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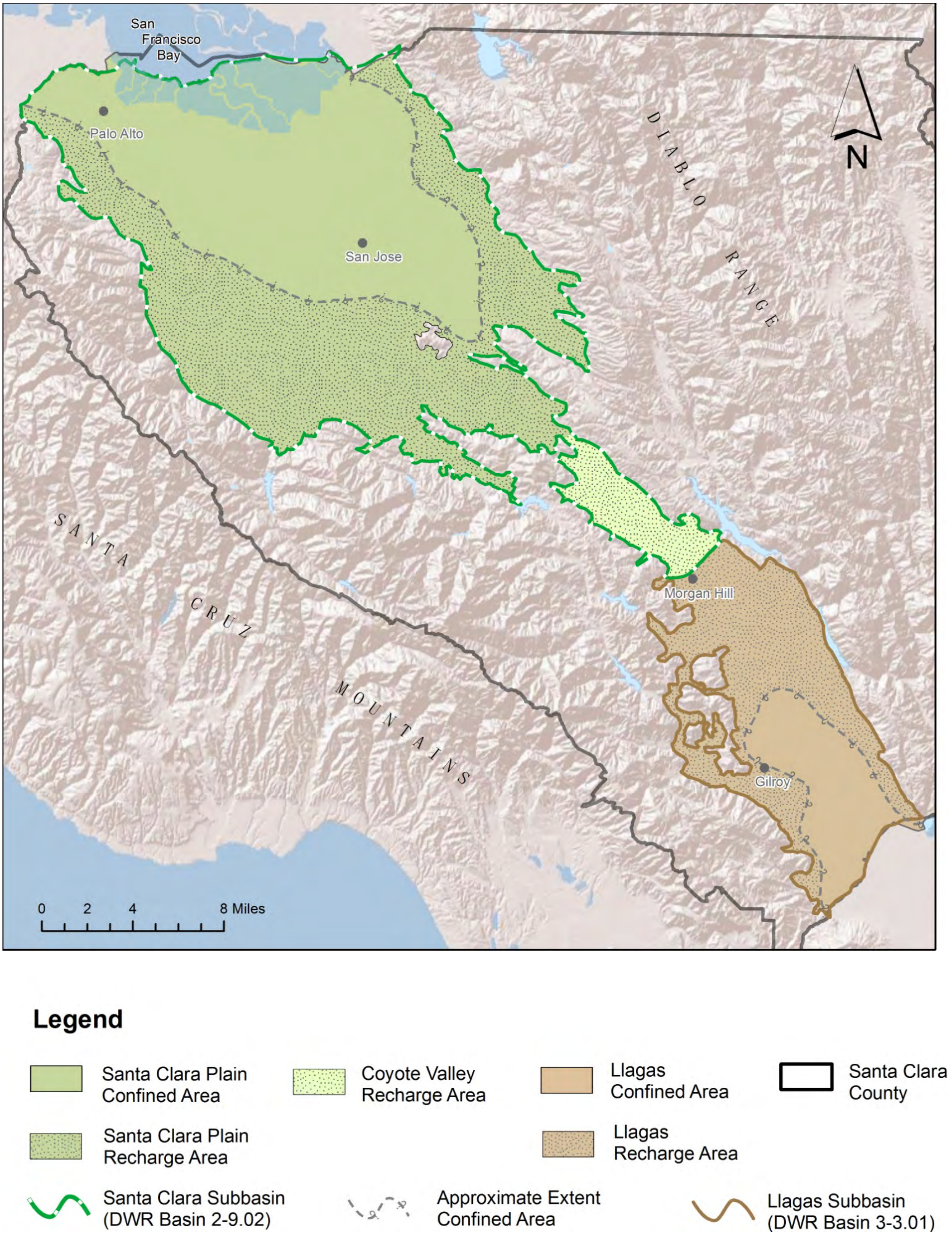
[3] California Department of Water Resources, Bulletin 118, 2003.

Figure 2-5 Santa Clara County Groundwater Subbasins



2.3.1 Santa Clara Subbasin

The Santa Clara Subbasin (Basin 2-9.02) extends from the southern edge of San Francisco Bay through the Coyote Valley, with the subbasin boundary approximately located at Cochrane Road in Morgan Hill. The thickness of the aquifer materials ranges from about 150 feet near the Coyote Narrows to more than 1,500 feet in the interior of the subbasin. Groundwater movement generally follows surface water patterns, flowing towards the interior of the subbasin and northerly towards San Francisco Bay. As mentioned previously, the District further delineates the Santa Clara Subbasin into two management areas: the Santa Clara Plain and the Coyote Valley.

Santa Clara Plain Hydrogeology

The Santa Clara Plain is the northern portion of the Santa Clara Subbasin (Basin 2-9.02) and extends from southern San Francisco Bay to the Coyote Narrows, near Metcalf Road. The Santa Clara Plain is divided into confined and recharge areas. The confined area is located in the northern and central portion while the recharge area occurs along the edges of the subbasin adjacent to the foothills. Except during periods of extended drought and significantly lowered water levels in the principal aquifer, the vertical gradient in much of the confined area is upward. The gradient in the recharge area and near the edge of the confined area/recharge area boundary is downward.

The Santa Clara Plain is vulnerable to land subsidence, with approximately 13 feet of inelastic (permanent) subsidence observed in San Jose between 1915 and 1969 due to groundwater overdraft. As a result of overdraft, fluid pressure in the aquifers was reduced, resulting in the compression of clay layers and a sinking of the land surface. The land surface subsided by 3 to 6 feet in a larger area which encompasses north San Jose, Santa Clara, Sunnyvale, and Mountain View. Serious problems developed as a result of subsidence including flooding of lands adjacent to San Francisco Bay, decreased ability of local streams to carry away winter flood waters, and damage to well casings. It is estimated that subsidence resulted in at least $30 to $40 million in damage (in 1982 dollars)[4]. This necessitated the construction of additional dikes, levees, and flood control facilities to protect properties from flooding. Figure 2-6 shows historical land subsidence between 1934 and 1967.

Significant inelastic subsidence was essentially halted by about 1970 through the District's expanded conjunctive use programs, which allowed artesian heads to recover substantially. Even with the managed recharge of local and imported water, groundwater alone cannot support this heavily urbanized area, and programs that reduce or offset groundwater pumping (like treated water deliveries and water conservation) are critical to avoid overdraft, additional permanent land subsidence, and salt water intrusion.

Due to high groundwater pumping and land subsidence after World War II, salt water intrusion was observed in the shallow aquifer of the Santa Clara Plain in an area bounded on the south by Highway 101 and Interstate 880. This was mainly caused by the inland migration of saline water through tidal creeks and subsequent transport to groundwater through streambed percolation and downward vertical gradients between shallow and principal zones. Although salt water intrusion has occurred in shallow aquifers near the Bay, significant effects have not been observed in the principal aquifer and many wells monitored are showing decreases in chloride[5].

The operational storage capacity of the Santa Clara Plain has previously been estimated to be 350,000 AF[6]. The operational storage capacity is less than total storage capacity as it accounts for the avoidance of adverse impacts such as inelastic land subsidence and salt water intrusion. The District is currently working to refine the operational storage capacity estimate based on historically observed data.

[4] USGS, Land Subsidence in the Santa Clara Valley, California as of 1982, Professional Paper 497-F, 1988.

[5] Santa Clara Valley Water District, 2010 Groundwater Quality Report, June 2011.

[6] Santa Clara Valley Water District, 2001 Groundwater Management Plan, July 2001.

Groundwater levels in the Santa Clara Plain are currently above subsidence thresholds and the risk of inelastic land surface subsidence is low. Predominantly upward vertical gradients in the confined zone minimize the risk of salt water intrusion. A typical hydrograph for the Santa Clara Plain is shown below in Figure 2-7. Groundwater quality in the Santa Clara Plain is typically very good. In 2010, three principal aquifer zone wells out of 166 tested contained contaminants above the Maximum Contaminant Level (MCL) for aluminum or nitrate[4]. This includes testing at both private domestic wells and public water supply wells (which must meet drinking water standards and may blend or treat the water prior to delivery).

Santa Clara Plain Pumping

In 2010, groundwater pumping in the Santa Clara Plain was approximately 81,100 AF. As shown on Figure 2-8, 96% of the water pumped was for municipal and industrial uses, with minor amounts used for agriculture and domestic purposes. Figure 2-8 also shows the number of wells reporting groundwater pumped for each of these uses in 2010. It should be noted that a single well may be used for more than one purpose. Water retailer pumping accounted for nearly 90% of the groundwater pumped from the Santa Clara Plain in 2010. Although there is some variation from year to year, this represents typical recent pumping patterns for the Santa Clara Plain.

Figure 2-6 Historical Land Subsidence in the Santa Clara Plain

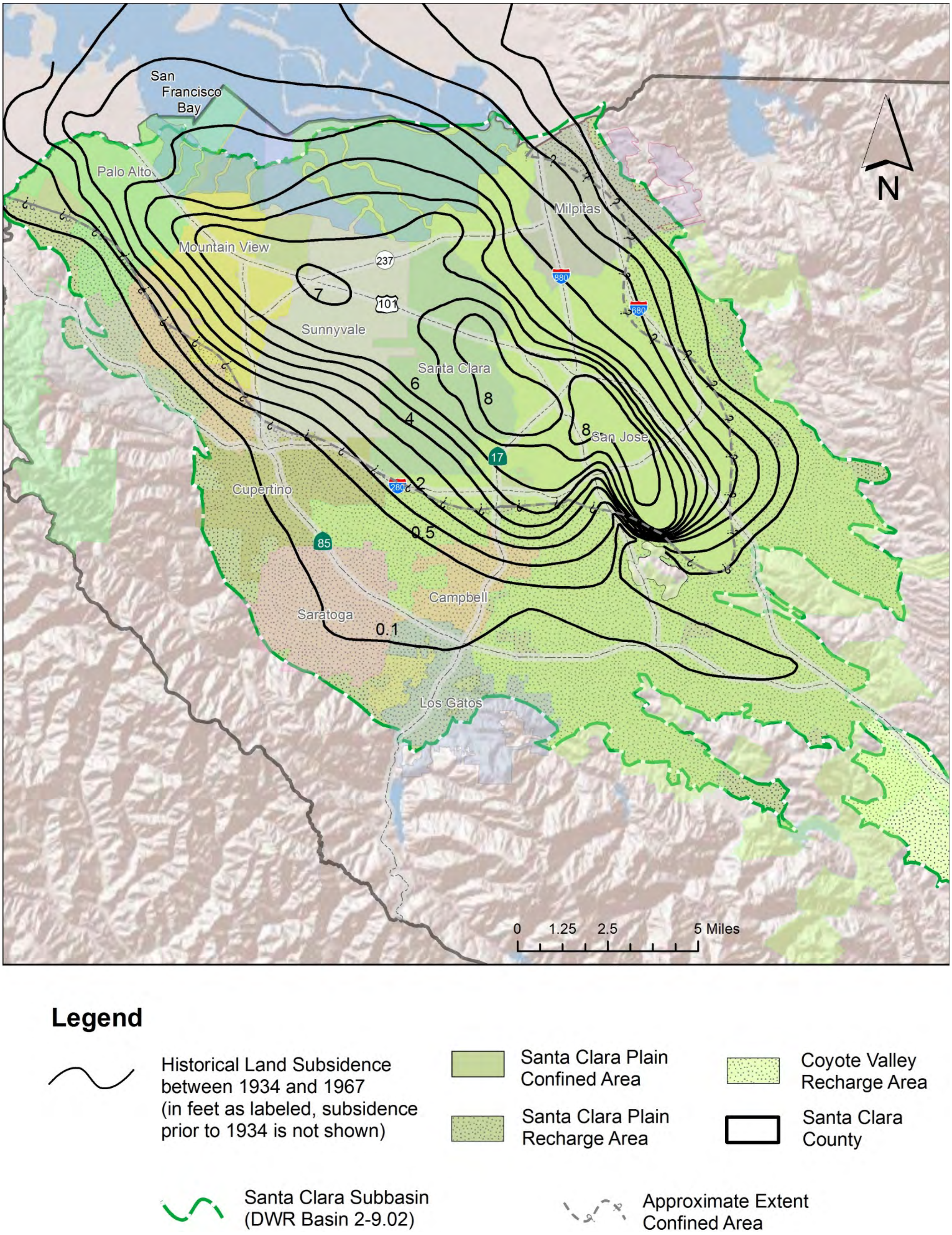


Figure 2-7 Groundwater Level at Santa Clara Plain Well 07S01W25L001

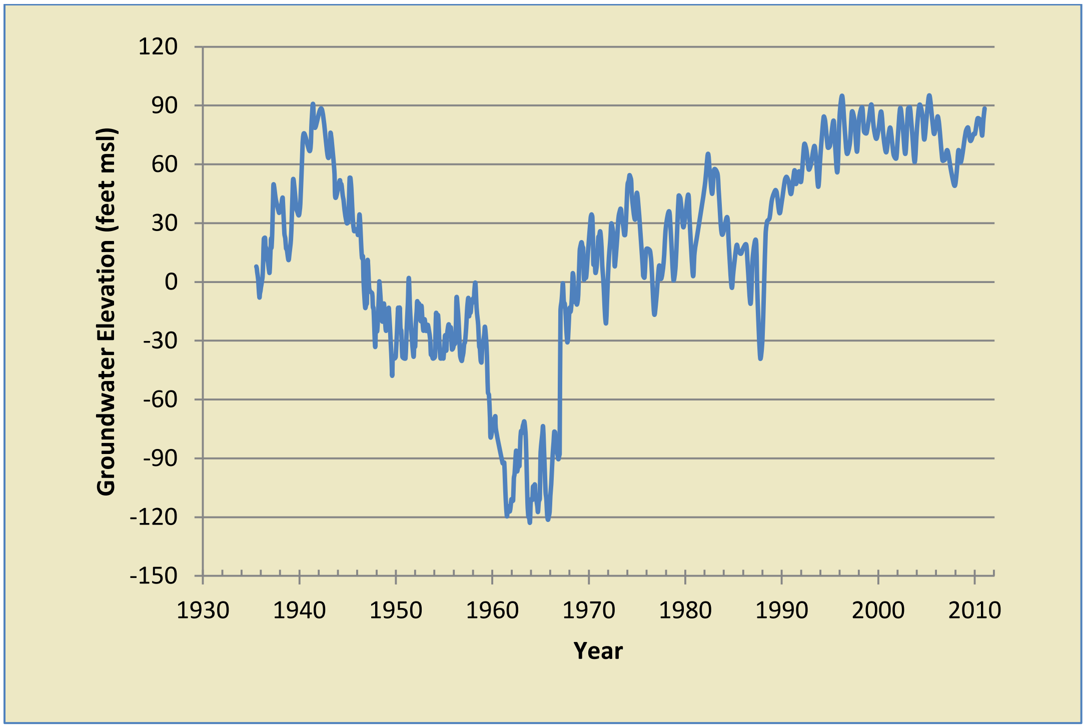
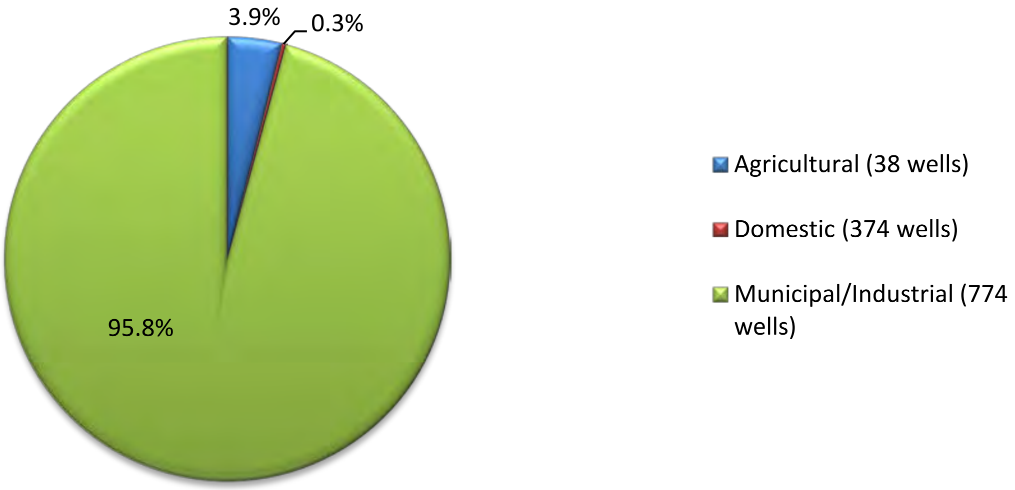


Figure 2-8 Santa Clara Plain 2010 Groundwater Use



Santa Clara Plain Water Budget

As shown in Figure 2-9, long-term groundwater pumping for the Santa Clara Plain averages about 95,000 AF per year based on data from 2002 to 2011. Historical pumping has been as high as 180,000 AF per year, although not without adverse impacts including inelastic land subsidence. The subsurface outflow from the Santa Clara Plain, which includes outflow to San Francisco Bay, was 6,000 AF. Average recharge to the Santa Clara Plain is estimated to be about 94,000 AF per year and sources include the District's managed recharge of local and imported water, the deep percolation of rainfall, natural seepage from creeks, and subsurface inflow from surrounding hills (mountain front recharge). On average, about two-thirds of recharge to the Santa Clara Plain comes from the District's managed recharge program. Subsurface inflow from adjacent aquifer systems including the Coyote Valley is estimated to be about 8,000 AF per year. The average annual change in groundwater storage between 2002 and 2011 is approximately 1,000 AF.

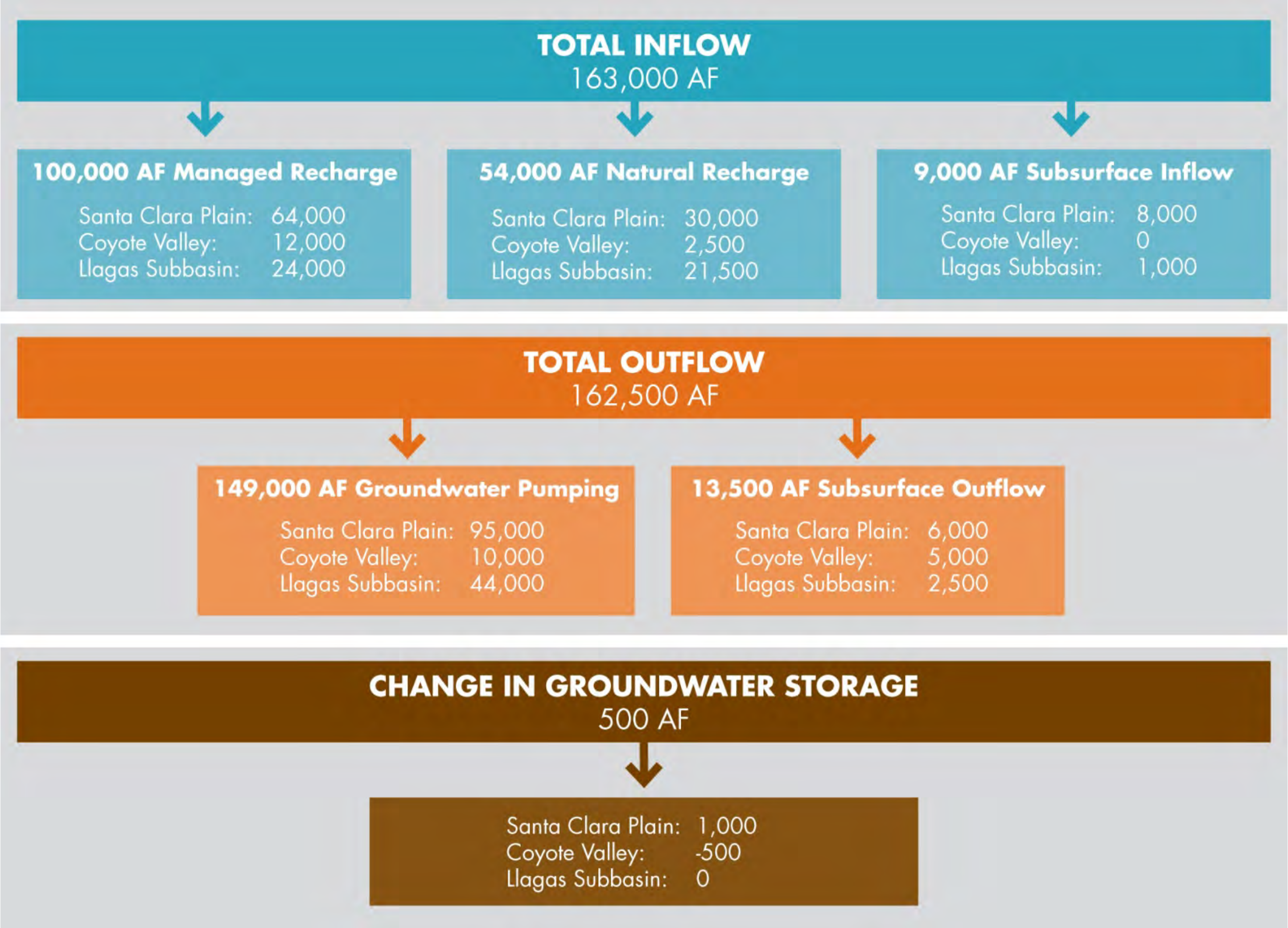
Santa Clara Plain Challenges

Many water retailers overlying the Santa Clara Plain identify groundwater pumping as an emergency backup supply in case of outage or shortage in their other supplies, so it is critical that these other supplies are maintained and that groundwater pumping levels are monitored to ensure that subsidence is not reinitiated. Other challenges include uncertainties in surface water supplies, including constraints and risks related to Delta exports, Hetch Hetchy interruptible contract terms, and climate change. Significant changes in groundwater pumping due to these challenges will increase the risk of renewed land subsidence and salt water intrusion.

In many ways, the Santa Clara Plain has the greatest water supply management flexibility. This area receives recharge water through a number of recharge facilities, using both local and imported water (both the CVP and SWP). It also has the greatest variety of in-lieu recharge programs available, with District treated water sales and Hetch Hetchy deliveries to the area's water retailers, as well as recycled water programs from three wastewater plants.

With a few notable exceptions, including the IBM and Fairchild Superfund sites, drinking water impacts from contamination have been relatively minor, considering the intensity of urbanization and the number of contaminant release sites in the area. However, intensified land use, salt loading, emerging contaminants, expanded recycled water use in recharge areas, and more stringent water quality regulations present significant challenges to groundwater protection. In addition to natural protection provided to the principal aquifer by clay layers in the confined zone, the District's well construction and destruction programs, coordination with land use and regulatory agencies, and the upward pressures and dilution resulting from the District's managed recharge program have helped reduce the migration of pollution into deeper drinking water aquifers. These programs, as well as groundwater monitoring to detect adverse trends, should be continued to help address risks related to groundwater quality.

Figure 2-9 2002 to 2011 Average Groundwater Budget for the Santa Clara Plain, Coyote Valley, and Llagas Subbasin



Notes:

1. Managed recharge represents direct replenishment by the District using local and imported water.
2. Natural recharge includes all uncontrolled recharge, including the deep percolation of rainfall, septic system and/or irrigation return flows, and natural seepage through creeks.
3. Subsurface inflow represents inflow from adjacent aquifer systems. In the Santa Clara Plain, this includes inflow from the Coyote Valley. In the Llagas Subbasin, it represents inflow from the Bolsa Subbasin in San Benito County.
4. Groundwater pumping is based on pumping reported by water supply well owners.
5. Subsurface outflow represents outflow to adjacent aquifer systems. In the Santa Clara Plain, this includes outflows to San Francisco Bay. In Coyote Valley, this includes outflow to the Santa Clara Plain, and in the Llagas Subbasin, this includes outflows to the Bolsa Subbasin in San Benito County.

Coyote Valley Hydrogeology

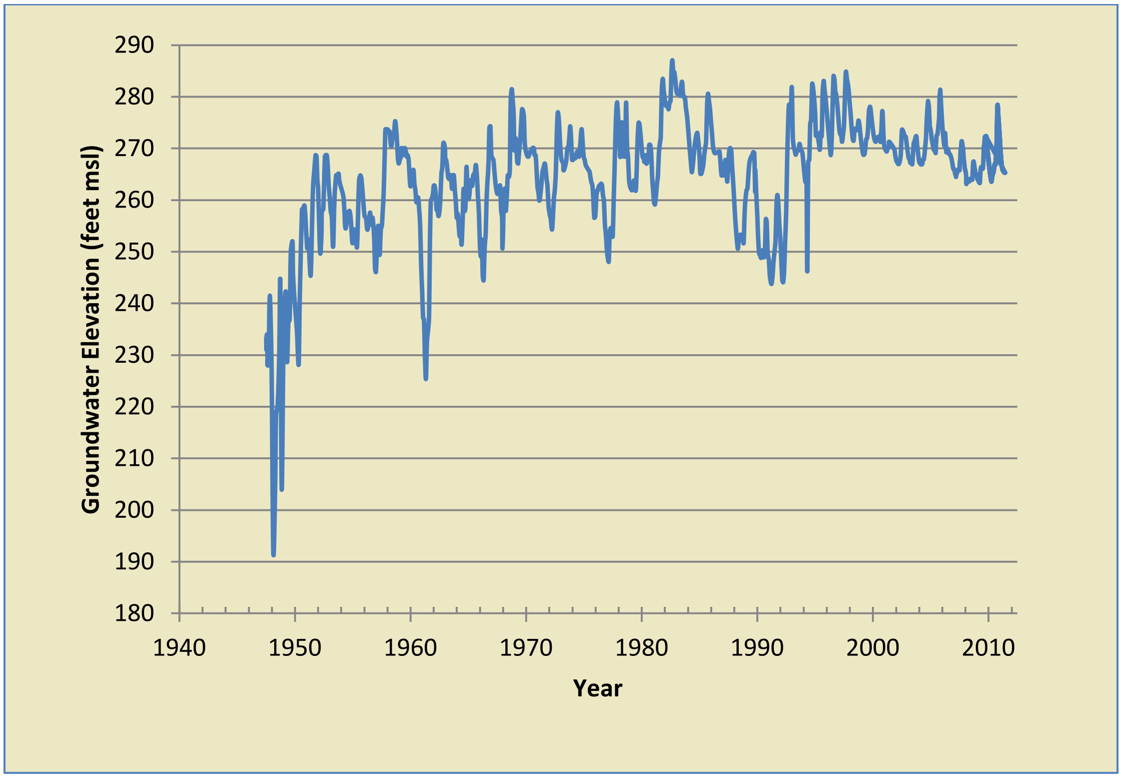
The Coyote Valley, the southern portion of the Santa Clara Subbasin, extends from the Coyote Narrows in the north to Cochrane Road in the south, where it borders the Llagas Subbasin. Unlike the Santa Clara Plain, no significant laterally extensive silt or clay layers exist, and groundwater occurs under unconfined conditions. The Coyote Valley is not vulnerable to land subsidence.

Groundwater is often quite shallow and is typically found between 5 and 40 feet below ground surface, generally flowing northwest and draining into the Santa Clara Plain. Groundwater is the only source of water for water users in the area and most residents rely on private wells. Groundwater levels in the Coyote Valley respond rapidly to changes in hydrology and pumping. Local groundwater moves toward areas of intense pumping, especially at the southeastern and northern parts of the subbasin where retailer groundwater production wells are located.

The operational storage capacity of the Coyote Valley has previously been estimated to range between 23,000 and 33,000 AF[7]. The operational storage capacity is less than total storage capacity as it accounts for the avoidance of adverse impacts. The District is currently working to refine the operational storage capacity estimate based on historically observed data.

Typical groundwater levels for the Coyote Valley are shown below in Figure 2-10. Groundwater quality in the Coyote Valley is generally good. In 2010, 3 wells tested contained contaminants above the MCL for aluminum or nitrate[8]. This includes testing at both private domestic wells and public water supply wells (which must meet drinking water standards and may blend or treat the water prior to delivery).

Figure 2-10 Groundwater Level at Coyote Valley Well 09S02E02J002



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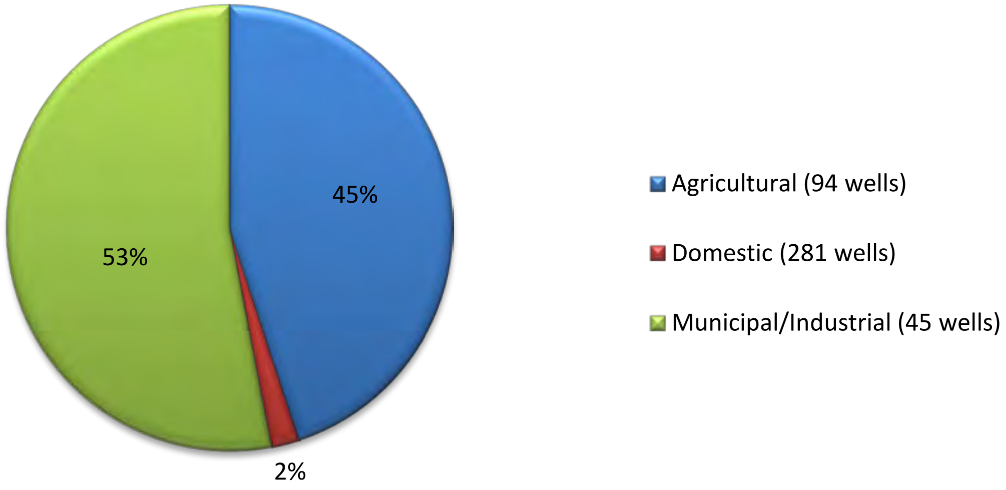
[7] Santa Clara Valley Water District, Operational Storage Capacity of the Coyote and Llagas Groundwater Subbasins, April 2002.

[8] Santa Clara Valley Water District, 2010 Groundwater Quality Report, June 2011.

Coyote Valley Pumping

In 2010, groundwater pumping in the Coyote Valley was approximately 12,300 AF. As shown on Figure 2-11, over half (53%) of groundwater pumped was for municipal and industrial uses (M&I) and 45% of groundwater pumped was used for agriculture. Only 2% of groundwater pumping was for domestic use, although more wells reported domestic use than M&I or agriculture. It should be noted that a single well may be used for more than one purpose. Pumping by water retailers accounted for over 60% of pumping in the Coyote Valley in 2010. Although there is some variation from year to year, this figure represents typical recent pumping patterns for the Coyote Valley.

Figure 2-11 Coyote Valley 2010 Groundwater Use



Coyote Valley Water Budget

The average groundwater pumping between 2002 and 2011 is about 10,000 AF per year as shown in Figure 2-9. The subsurface outflow, which includes flows to the Santa Clara Plain, is estimated to be about 5,000 AF per year. Annual recharge is estimated to be about 14,500 AF per year, with approximately 80 percent of that coming from the District's managed recharge. Natural sources of recharge include the deep percolation of rainfall, subsurface inflow from surrounding hills (mountain front recharge), natural seepage from creeks, and return flows from septic systems and irrigation. Coyote Valley is dependent on Coyote Creek for its water supply, which is predominately fed by District releases from the Anderson-Coyote reservoir system and CVP imported water. The average annual change in storage between 2002 and 2011 is approximately -500 AF.

Coyote Valley Groundwater Challenges

The Coyote Valley is on the threshold of change. Although it has been largely rural with very little increase in water demand over many years, groundwater pumping has increased dramatically since 2006 with the addition of water retailer wells extracting groundwater for use in other areas. Because water supply reliability in the Coyote Valley is dependent on managed recharge, this area has similar water supply uncertainties as the Santa Clara Plain, including constraints and risks related to Delta exports and seismic operating restrictions on local reservoirs. In addition, the area is within the Sphere of Influence of the City of San Jose, which has considered the area for significant future urban development. Significant changes in groundwater pumping due to these challenges will increase the risk of groundwater overdraft. As an unconfined aquifer with little separation between the land surface and groundwater surface, this area is highly sensitive to potential groundwater contamination.

Currently, water supply management flexibility in the Coyote Valley is limited. Historically, low-lying areas in the north and western portions of the valley have experienced drainage difficulties, including high groundwater conditions. Maintaining groundwater supplies while avoiding nuisance high-groundwater conditions is a challenge made more difficult by the important fishery and habitat needs supported by stream flows in Coyote Creek.

2.3.2 Llagas Subbasin

The Llagas Subbasin (Basin 3-3.01) lies to the south of the Santa Clara Subbasin. The Llagas Subbasin extends from a groundwater divide in the north at Cochrane Road to the Pajaro River in the south.

Llagas Subbasin Hydrogeology

The subbasin consists of a number of discontinuous layers of gravel and sand (aquifer materials) and clay and silt (confining units) at various depths beneath the ground surface. Similar to the Santa Clara Plain, the Llagas Subbasin is divided into confined and recharge areas. The recharge area occurs in the northern portion of the subbasin and along the edges of the subbasin adjacent to the foothills. Groundwater occurs under unconfined conditions in the recharge area. In the southern portion of the subbasin, clays and silts become more vertically and laterally extensive, forming a confined area. Within the confined area, laterally-extensive clays and silts divide aquifer materials into shallow and principal zones. Studies conducted using satellite images to measure changes in land surface elevation do not indicate evidence of land subsidence in the Llagas Subbasin[9]. Groundwater movement generally follows surface water patterns, draining south toward the Pajaro River.

The operational storage capacity of the Llagas Subbasin has previously been estimated to range between 152,000 and 165,000 AF[10]. The operational storage capacity is less than total storage capacity as it accounts for the avoidance of adverse impacts. The District is currently working to refine the operational storage capacity estimate based on historically observed data.

Typical groundwater levels for the Llagas Subbasin are shown below in Figure 2-12. Groundwater quality in the Llagas Subbasin is good, with the exception of nitrate and perchlorate. In 2010, the number of wells in principal aquifer zone containing nitrate or perchlorate above the MCL was 9 and 2, respectively, out of 69 wells tested[11]. This includes testing at both private domestic wells and public water supply wells (which must meet drinking water standards and may blend or treat the water prior to delivery).

Llagas Subbasin Pumping

In 2010, groundwater pumping in the Llagas Subbasin was approximately 40,000 AF. As shown on Figure 2-13, nearly half (49%) of groundwater pumped was for agricultural uses while 46% was for municipal and industrial uses. Similar to the Coyote Valley, a small amount of groundwater pumping was for domestic use (5%), although that small use represents over 2,300 individual wells. It should be noted that a single well may be used for more than one purpose. Pumping by water retailers accounted for over 60% of pumping in the Llagas Subbasin in 2010.

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[9] Burgmann, R. and Johanson, I. for Santa Clara Valley Water District, South County Subsidence Study, 2005.

[10] Santa Clara Valley Water District, Operational Storage Capacity of the Coyote and Llagas Groundwater Subbasins, April 2002.

[11] Santa Clara Valley Water District, 2010 Groundwater Quality Report, June 2011.

Although there is some variation from year to year, this figure represents typical recent pumping patterns for the Llagas Subbasin.

Figure 2-12 Groundwater Level at Llagas Subbasin Well 10S03E13D003

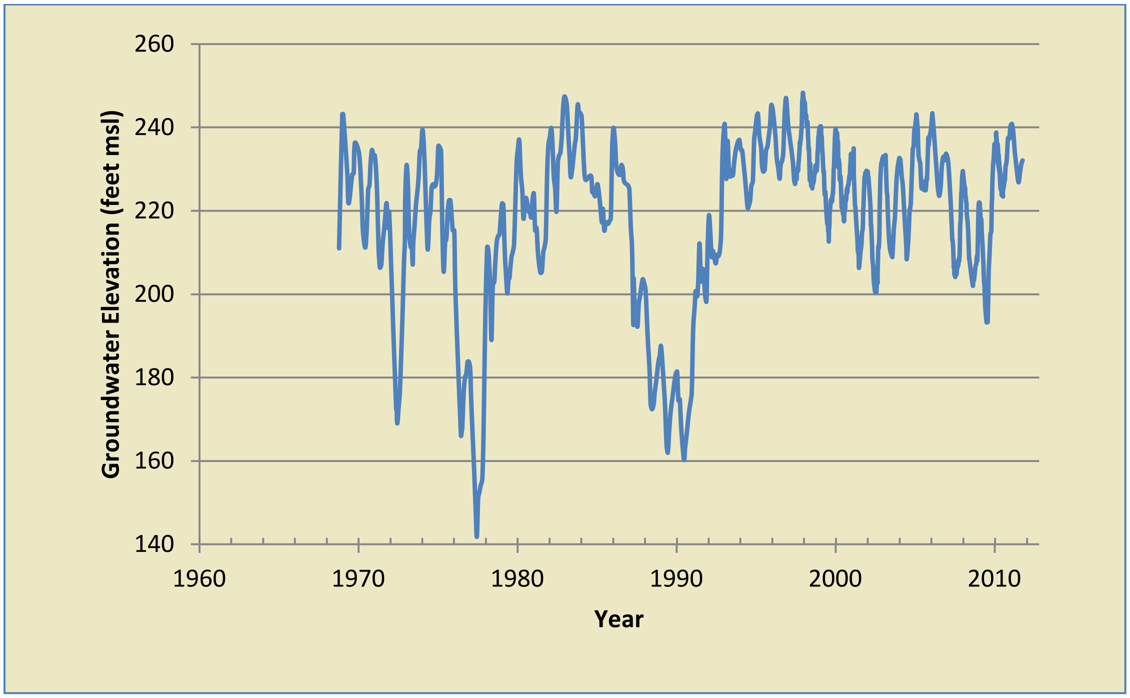
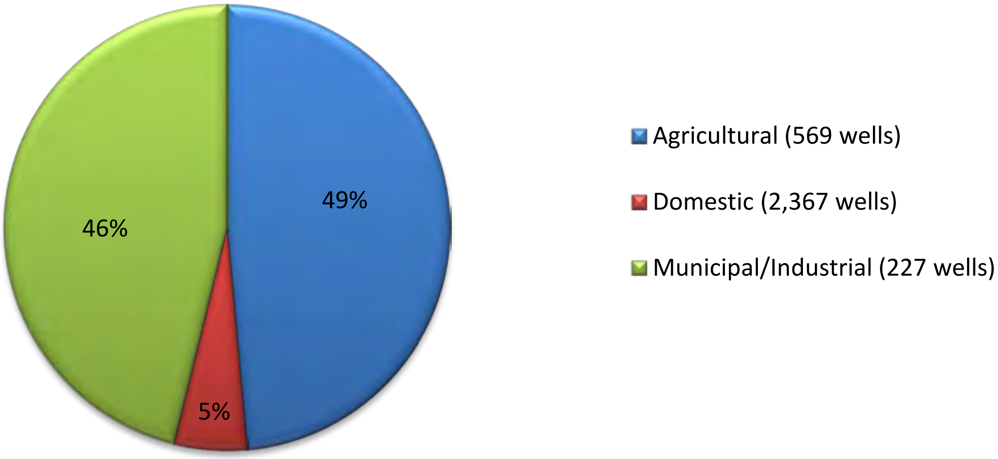


Figure 2-13 Llagas Subbasin 2010 Groundwater Use



Llagas Subbasin Water Budget

Groundwater pumping from the Llagas Subbasin averages about 44,000 AF per year (Figure 2-9). The subsurface outflow, which includes flows to the Bolsa Subbasin in San Benito County, is estimated to be about 2,500 AF per year. Recharge is estimated to be 45,500 AF per year, with about half coming from the District's managed recharge of local and imported water. Both imported (CVP) and locally captured surface water can be recharged in the Llagas Subbasin. Natural sources of recharge include the deep percolation of rainfall, natural seepage from creeks, subsurface inflow from surrounding hills (mountain front recharge), and return flows from septic systems and irrigation. The average annual change in storage between 2002 and 2011 is approximately 0 AF, indicating inflows and outflows are generally balanced over the ten year period evaluated.

Llagas Subbasin Challenges

The Llagas Subbasin, serving the cities of Morgan Hill and Gilroy, is not as urbanized as the Santa Clara Subbasin and areas like San Martin retain the region's rural and agricultural roots. Water supply facilities and operations in South County are not as flexible as in the Santa Clara Plain, with less ability to move water around and no treated surface water or Hetch-Hetchy water available. Water supply management is complicated by the fact that the aquifer materials in the northern extent, where the City of Morgan Hill pumps its water supply, are much thinner than the southern portion of the basin where the City of Gilroy draws its water. This results in the City of Morgan Hill being more susceptible to water supply impacts in the event of drought. Like the Santa Clara Plain and Coyote Valley, the water supply uncertainties in the Llagas Subbasin include constraints and risks related to Delta exports and seismic operating restrictions on local reservoirs, which could have significant effects on the District's managed recharge.

Nitrate from agricultural practices and septic systems is an ongoing groundwater quality concern in the Llagas Subbasin, with many wells approaching or above the 45 milligram per liter MCL established by the California Department of Public Health. There are thousands of private domestic well owners in the Llagas Subbasin that are not required to conduct regular testing of their water, and as such, may be unaware that they may be consuming water with elevated contaminants. The District has implemented numerous programs to try to reduce nitrate loading and customer exposure to nitrate, and continues to work with land use agencies, regulatory agencies, and other basin stakeholders to address elevated nitrate.

In 2003, perchlorate was discovered at the Olin facility in Morgan Hill and over a wide area in the Llagas Subbasin, impacting several hundred private wells and several municipal wells. However, perchlorate concentrations are declining. In 2004, there were 188 domestic wells with perchlorate above the MCL of 6 micrograms per liter (µg/L). In July 2011, there were only 8 domestic wells with perchlorate above the MCL. The District continues to advocate for the timely restoration of groundwater and works closely with the Central Coast Regional Water Quality Control Board who has regulatory jurisdiction over the case.

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3 2012 GROUNDWATER MANAGEMENT PLAN
Basin Management Objectives and Strategies

This chapter summarizes the basin management objectives and strategies. These objectives and strategies were developed within the broader context established by the District Act and District Board policies.

3.1 DISTRICT BOARD POLICY

The District is an independent special district formed by the California legislature under the Santa Clara Valley Water District Act for the primary purpose of providing comprehensive management for all beneficial uses and protection from flooding within Santa Clara County. As stated in the District Act, the District’s objectives and authority related to groundwater management are to recharge the groundwater basins, conserve, manage and store water for beneficial and useful purposes, increase water supply, protect surface water and groundwater from contamination, prevent waste or diminution of the District's water supply, and do any and every lawful act necessary to ensure sufficient water is available for present and future beneficial uses.

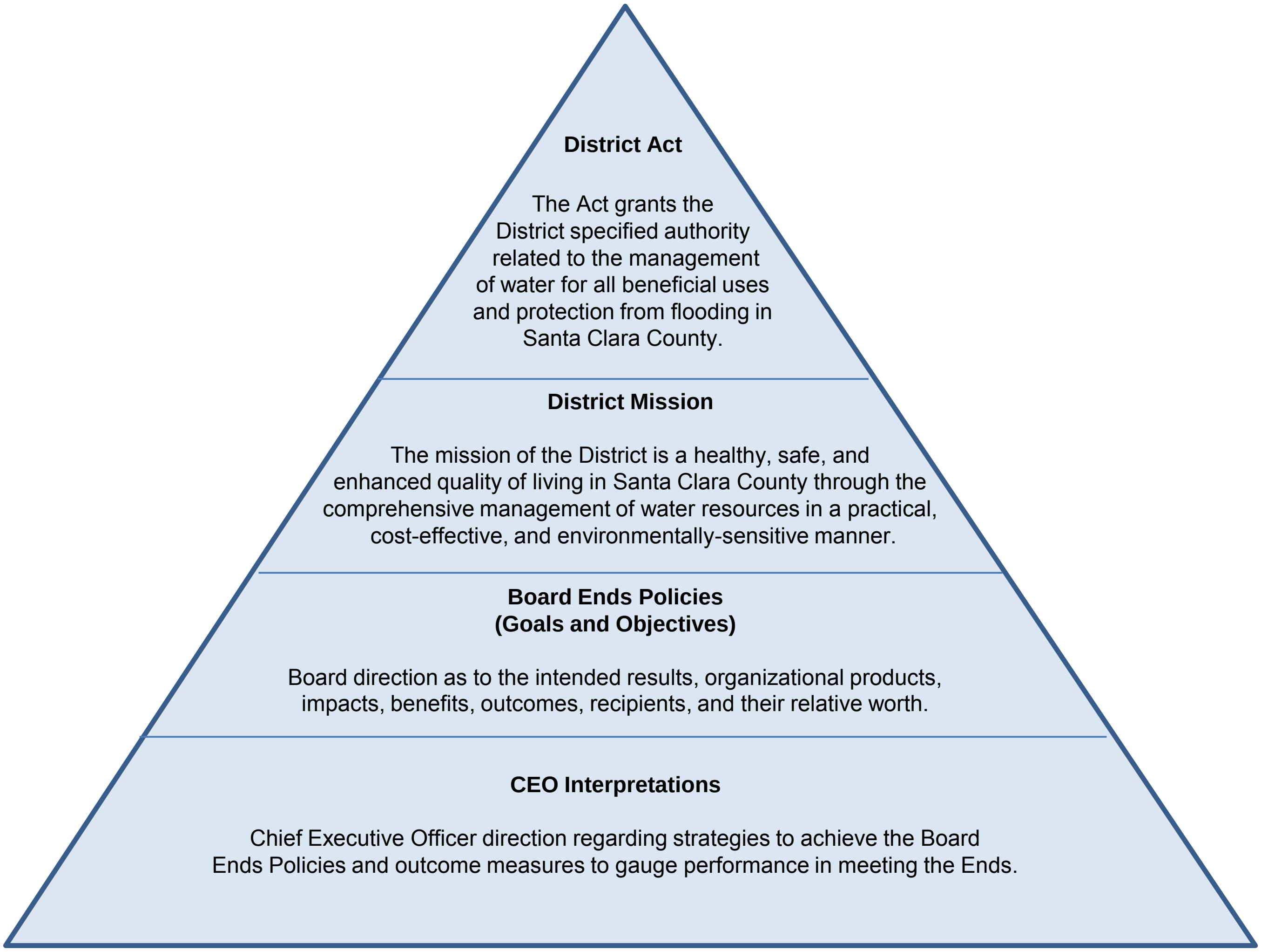
The District manages the Santa Clara and Llagas Subbasins as an integrated component of the overall water supply, and as such the objectives and strategies for groundwater management are based on the existing District Board of Directors Ends Policies listed below.

- Board Water Supply Goal 2.1: Current and future water supply for municipalities, industries, agriculture, and the environment is reliable.
- Board Water Supply Objective 2.1.1: Aggressively protect groundwater from the threat of contamination and maintain and develop groundwater to optimize reliability and to minimize land subsidence and salt water intrusion.

District programs and activities are developed in accordance with the District Act objectives and based on policy guidance from the Board of Directors. The Chief Executive Officer (CEO) has also developed CEO Interpretations, which include direction, strategies, and outcome measures. Outcome measures are specific, measurable goals to gauge performance toward meeting the Board Ends Policies. The relationship of the District Act, Board policies, and CEO Interpretations is shown below in Figure 3-1.

The basin management objectives and strategies in this 2012 GMWP are developed within this policy framework and share a parallel structure. The relationship between the District Act, District Policies, the basin management objectives (BMOs), and District groundwater programs are shown in Figure 3-2, with each level taking direction from the level above. The basin management objectives and strategies are described below. Programs supporting those objectives and strategies are presented in Chapter 4, with monitoring and performance measurement discussed in Chapters 5 and 6, respectively.

Figure 3-1 District Board Policy Framework



District Act

The Act grants the District specified authority related to the management of water for all beneficial uses and protection from flooding in Santa Clara County.

District Mission

The mission of the District is a healthy, safe, and enhanced quality of living in Santa Clara County through the comprehensive management of water resources in a practical, cost-effective, and environmentally-sensitive manner.

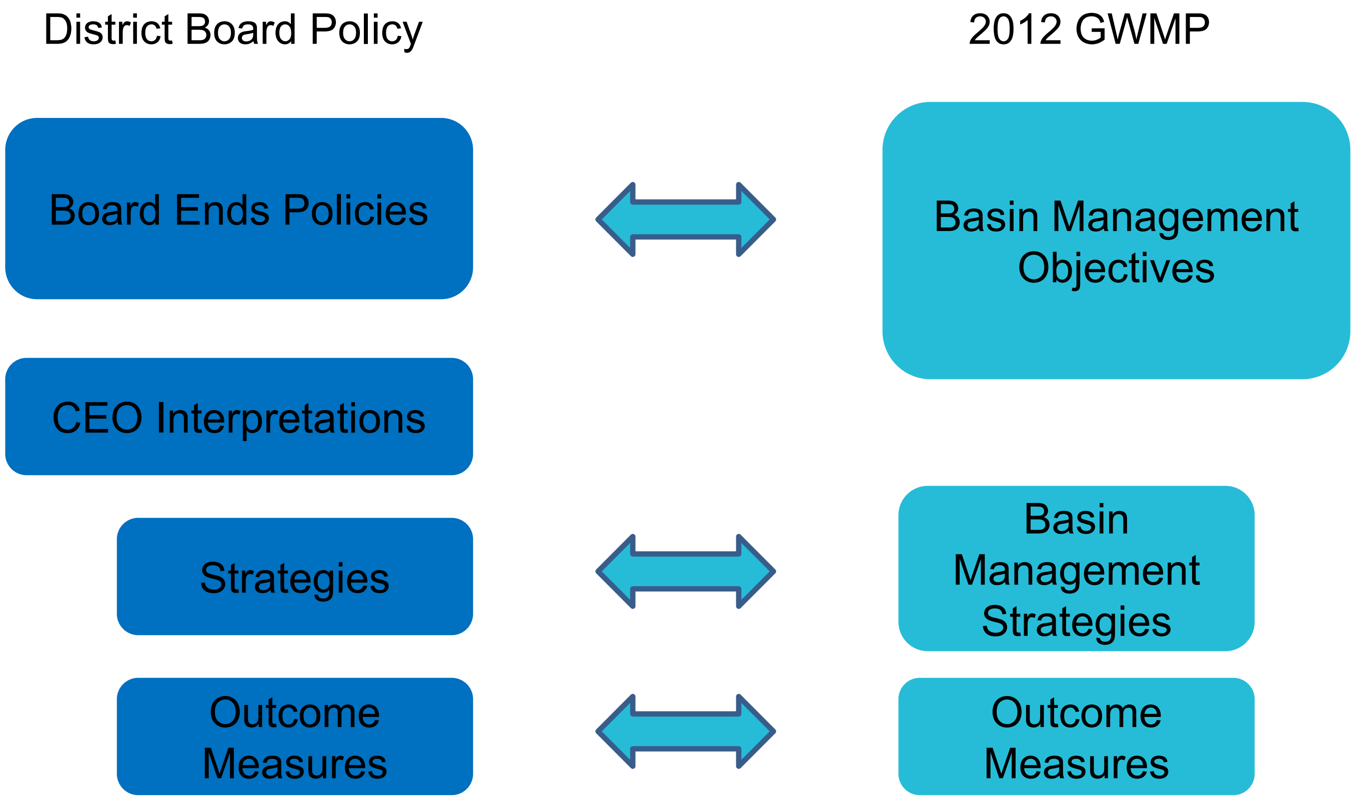
Board Ends Policies
(Goals and Objectives)

Board direction as to the intended results, organizational products, impacts, benefits, outcomes, recipients, and their relative worth.

CEO Interpretations

Chief Executive Officer direction regarding strategies to achieve the Board Ends Policies and outcome measures to gauge performance in meeting the Ends.

Figure 3-2 Relation Between District Policy and 2012 GWMP



3.2 BASIN MANAGEMENT OBJECTIVES

Using the District's overall water supply management objectives, the following basin management objectives (BMOs) were developed:

BMO 1: Groundwater supplies are managed to optimize water supply reliability and minimize land subsidence.

BMO 2: Groundwater is protected from existing and potential contamination, including salt water intrusion.

These BMOs describe the overall goals of the District's groundwater management program. The rationale and meaning of these objectives, as well as their relationship to District policies, are discussed below.

Water Supply Reliability and Minimization of Land Subsidence (BMO 1)

BMO 1: Groundwater supplies are managed to optimize water supply reliability and minimize land subsidence.

The District relies on groundwater for a significant portion of the county's water supply, particularly in South County where groundwater provides more than 95% of supply for all beneficial uses and 100% of the drinking water supply. Local groundwater resources make up the foundation of the county's water supply, but they need to be augmented by the District's comprehensive water supply management activities in order to reliably meet the needs of county residents, businesses, agriculture and the environment. The District relies on the conjunctive use of groundwater and surface water to meet the county's water demands now and in the future.

The District's goal of minimizing land subsidence is combined with the water supply reliability goal since the actions taken to address one also addresses the other. Significant historical land subsidence due to groundwater overdraft was essentially halted by about 1970 through the District's expanded conjunctive use programs, which allowed groundwater levels to recover substantially. The avoidance of inelastic (or permanent) land subsidence has been a major driver for the District over its history given the extremely high costs associated with reduced carrying capacity of flood control structures, damage to infrastructure, and salt water intrusion.

BMO 1 reflects the District's integrated approach to water supply reliability and commitment to minimizing land subsidence and is consistent with the following Board policies:

- Board Water Supply Goal 2.1: Current and future water supply for municipalities, industries, agriculture, and the environment is reliable.
- Board Water Supply Objective 2.1.1: Aggressively protect groundwater from the threat of contamination and maintain and develop groundwater to optimize reliability and to minimize land subsidence and salt water intrusion.

Groundwater Quality Protection (BMO 2)

BMO 2: Groundwater is protected from existing and potential contamination, including salt water intrusion.

While surface water goes through significant treatment processes before being served as drinking water, groundwater in this county typically does not require wellhead treatment before being served. Although the District does not serve groundwater directly to consumers, as the local groundwater management agency the District works to help ensure that the groundwater used by the residents and businesses of Santa Clara County is of reliably high quality.

In highly urbanized areas such as the Bay Area, there are numerous threats to groundwater quality including urban runoff, industrial chemicals, and underground storage tanks. Residential and agricultural use of pesticides and nitrogen-based fertilizers can also impact groundwater quality. Although the process of moving through soil layers provides some filtration of water, this natural process is not effective for all contaminants.

Groundwater degradation may lead to costly treatment or even make groundwater unusable, resulting in the need for additional supplies. Preventing groundwater contamination is more cost effective than cleaning up polluted groundwater, a process that can take many decades or longer depending on the nature and extent of the contamination. Notable contamination sites in the county requiring significant groundwater cleanup include large solvent releases at the IBM and Fairchild sites in south San Jose in the 1980s and the Olin perchlorate release in Morgan Hill, which was discovered in the early 2000s.

Historically, salt water intrusion has been observed in the shallow aquifer adjacent to San Francisco Bay during periods of higher groundwater pumping and land subsidence. Significant increases in groundwater pumping or sea level rise due to climate change could potentially lead to renewed salt water intrusion.

The goal of the District's groundwater quality protection programs is to ensure that groundwater is a viable water supply for current and future beneficial uses. In addition to the primary deep drinking water aquifers, the District works to protect the quality of all aquifers in the local subbasins, including shallow groundwater, as these are potential future sources for drinking water or other beneficial use.

Section 5 of the District Act authorizes the District to prevent the pollution and contamination of District surface water and groundwater supplies. BMO 2 is consistent with the District Act and with Board Water Supply Objective 2.1.1: Aggressively protect groundwater from the threat of contamination and maintain and develop groundwater to optimize reliability and to minimize land subsidence and salt water intrusion.

3.3 Basin Management Strategies

The basin management strategies are the methods that will be used to meet the BMOs. Many of these strategies have overlapping benefits to groundwater resources, acting to improve water supply reliability, minimize subsidence, and protect groundwater quality. The strategies are listed below and are also described in detail in this section.

1. Manage groundwater in conjunction with surface water through direct and in-lieu recharge programs to sustain groundwater supplies and to minimize salt water intrusion and land subsidence.
2. Implement programs to protect or promote groundwater quality to support beneficial uses.
3. Maintain and develop adequate groundwater models and monitoring systems.
4. Work with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.

Strategy 1: Manage groundwater in conjunction with surface water through direct and in-lieu recharge programs to sustain groundwater supplies and to minimize salt water intrusion and land subsidence.

The District relies on local groundwater subbasins to help meet water demands, naturally transmit water over a wide area, and provide critical storage reserves for emergencies such as droughts or other outages. Because groundwater pumping far exceeds what is replenished naturally, the District manages groundwater and surface water in conjunction to ensure the groundwater subbasins remain an important component in meeting current and future water demands.

Maintaining the District's comprehensive managed recharge program using both local and imported waters is critical to sustaining groundwater supplies. This requires maintaining water supply sources and existing recharge facilities as well as developing additional recharge facilities to help support future needs as identified in the District's Water Supply and Infrastructure Master Plan. Currently, several of the District reservoirs have restricted storage capacity due to limitations imposed by Division of Safety of Dam (DSOD). Resolving dam safety issues that currently restrict reservoir storage is also an important component of this strategy.

Just as important as direct recharge are the availability of SFPUC supplies to the county, the District's treated water deliveries, water conservation and water recycling programs, which serve as in-lieu recharge by reducing groundwater demands. Together these programs help to maintain adequate groundwater storage, keep groundwater levels above subsidence thresholds, and maintain flow gradients toward San Francisco Bay. This, in turn, supports groundwater pumping and minimizes risks related to land subsidence and salt water intrusion.

The District's managed recharge and in-lieu programs are described in detail in Chapter 4 and specific outcome measures related to groundwater levels and storage are discussed in Chapter 6.

Strategy 2: Implement programs to protect or promote groundwater quality to support beneficial uses.

Groundwater in Santa Clara County is generally of very high quality, with few public water systems requiring wellhead treatment prior to delivery to customers. The District evaluates groundwater quality and potential threats so that changes in groundwater quality can be detected and appropriate action can be taken to protect the quality of groundwater resources. This includes assessing regional conditions and trends, evaluating threats to groundwater quality including emerging contaminants, conducting technical studies such as vulnerability assessments, and implementing strategies to protect groundwater from contaminant sources.

Groundwater protection programs are described in detail in Chapter 4 and specific outcome measures related to groundwater quality are presented in Chapter 6.

Strategy 3: Maintain and develop adequate groundwater models and monitoring systems.

Comprehensive monitoring programs provide critical data to understand groundwater conditions and support operational decisions, including the timing and location of managed recharge. The District has implemented programs to regularly monitor groundwater levels, groundwater quality (including monitoring near recycled water irrigation sites), recharge water quality, surface water flow, and land subsidence. Local water retailers also collect groundwater quality data for compliance with California Department of Public Health regulations and monitor groundwater levels. Data from these programs is essential to evaluating current conditions, preventing groundwater overdraft and subsidence, and measuring the effectiveness of basin management programs and activities. These monitoring programs and related monitoring protocols are described in Chapter 5.

The District has also developed models to support operational decisions and long-term planning. These include operational and water supply system models, as well as models specific to groundwater. The District has developed calibrated flow models for the Santa Clara Plain, Coyote Valley, and Llagas Subbasins, which are used to evaluate groundwater storage and levels under various operational and hydrologic conditions. These models are used to support ongoing water supply operational decisions as well as long-term planning efforts. Maintaining calibrated models that can reasonably forecast groundwater conditions is critical to the District's comprehensive groundwater management strategy.

Strategy 4: Work with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.

Since the 1950s, land use in the Santa Clara Plain has changed from largely rural and agricultural to a highly developed urban area. The increased amount of land covered by impervious materials has increased runoff and reduced natural recharge. Although not as urbanized as the Santa Clara Plain, the Llagas Subbasin serves the growing cities of Morgan Hill and Gilroy, and significant development has been considered in the Coyote Valley. This strategy calls for working with land use agencies to maximize natural recharge by protecting groundwater recharge areas and supporting the use of low-impact development.

Increased urbanization also increases the risk of contamination, particularly in groundwater recharge areas which are more vulnerable due to the presence of highly permeable sediments. The District coordinates with land use agencies with regard to potentially contaminating land use activities and resource protection. Regulatory agencies also play a critical role in groundwater protection with regard to the establishment of water quality objectives and the cleanup of contaminated sites. The District will continue to work with these agencies and identify opportunities for enhanced cooperation to minimize impacts from existing contamination and prevent additional contamination from occurring. This includes the development of technical studies, participation in policy development, and coordination on proposed development.

The relationship between the basin management objectives, strategies, and related programs and activities is shown below in Figure 3-3.

Figure 3-3 Relation Between Basin Management Objectives, Strategies, and Programs

Basin Management Objectives

BMO 1: Groundwater supplies are managed to optimize water supply reliability and minimize land subsidence.

BMO 2: Groundwater is protected from existing and potential contamination, including salt water intrusion.

Basin Management Strategies

1. Manage groundwater in conjunction with surface water through direct and in-lieu recharge programs to sustain groundwater supplies and to minimize salt water intrusion and land subsidence.
2. Implement programs to protect or promote groundwater quality to support beneficial uses.
3. Maintain and develop adequate groundwater models and monitoring systems.
4. Work with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.

Programs and Activities (Chapter 4)

Programs to maintain water supply reliability and minimize land subsidence

Programs to protect groundwater quality

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4 2012 GROUNDWATER MANAGEMENT PLAN

Basin Management Programs and Activities

District programs to protect and augment water supplies are implemented under powers granted by the District Act[1], which authorizes the District to provide comprehensive water management for all beneficial uses within Santa Clara County. The District Act authorizes the District to take action to protect and augment water supplies and includes the following actions:

- Conserve and manage water for beneficial and purposes, including spreading, storing, retaining, and groundwater recharge.
- Protect, save, store, recycle, distribute, transfer, exchange, manage, and conserve water.
- Increase and prevent the waste or diminution of the water supply.
- Obtain, retain, protect, and recycle water for beneficial uses.
- To do any and every lawful act necessary to be done that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants within the district.

The District has a number of programs and activities that support the groundwater subbasins, and other agencies also implement programs to protect groundwater resources. This chapter describes programs that help maintain a reliable water supply, prevent inelastic (permanent) land subsidence, and protect groundwater quality, both now and in the future. Monitoring programs are described in Chapter 5.

In addition to the programs described in this chapter, the District monitors emerging policy and regulatory trends; collaborates with key decision makers and stakeholders to affect policy change; cultivates relationship building and advocacy opportunities; and works with federal, state, and local government representatives on pending legislation or regulatory standards related to the protection of groundwater resources. The purpose of these activities is to ensure that District interests are communicated and considered in legislative and regulatory processes.

This chapter focuses on operations projects or ongoing basin management activities implemented by the District and other agencies. The District also implements capital projects as needed to support groundwater resources. These projects are described in the District's Capital Improvement Program[2].

4.1 PROGRAMS TO MAINTAIN WATER SUPPLY RELIABILITY AND MINIMIZE LAND SUBSIDENCE

The groundwater subbasins are one part, albeit a critical part, of the overall water supply of the District. The District manages water resources, including groundwater and imported water, and wholesales treated water to water retailers in Santa Clara County to achieve overall water supply reliability. By helping maintain groundwater levels and storage, these programs help avoid groundwater overdraft and prevent the resumption of inelastic land subsidence. Programs and activities supporting BMO 1 (Groundwater supplies are managed to optimize water supply reliability and minimize land subsidence) are described in detail below.

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[1] Santa Clara Valley Water District Act, Water Code Appendix Chapter 60.

[2] Santa Clara Valley Water District, 5-Year Capital Improvement Program, 2012-2016.

4.1.1 Managed Recharge

To offset groundwater withdrawals and ensure the long-term sustainability of groundwater resources, the District conducts a conjunctive use program whereby local and imported surface waters are used to replenish the groundwater subbasins through District recharge facilities. This section focuses on managed recharge operations, however it should be noted that many other District programs are needed to carry out the managed recharge program, including programs related to dam maintenance, the administration and management of imported water contracts, local water rights management, groundwater analysis, and maintenance of the raw water conveyance system.

By releasing locally conserved and imported waters from local reservoirs or the District's raw water distribution system, the District significantly increases groundwater recharge. On average, the District's managed recharge program replenishes twice the amount of water replenished naturally. District recharge facilities are designed for high and rapid infiltration based on their permeability and hydraulic characteristics. Through the District's managed recharge operations, approximately 95,200 AF[3] of water recharged the groundwater subbasins in 2011. This water came from a variety of sources, including the yields of the 10 local reservoirs and water imported from both the State Water and Central Valley Projects.

Recharge facilities are closely monitored by operations center personnel using a computerized control system and in the field by technicians. The raw water control system provides for remote operation of water distribution facilities and real-time system performance data. Operations technicians perform daily inspection of recharge facilities and record flows and water levels. Operations include daily monitoring of forecasts, inflows, and storage levels to plan releases for water supply operations, dam safety and bank stability, habitat management, and flood potential reduction.

Reservoirs and Diversions

The District constructed 10 reservoirs and 5 stream diversions to enable appropriation of water supplies under the District's water rights. The primary function of the District's surface water reservoirs is to store local and imported water for groundwater recharge. Dams are operated under certificates of approval from the State Division of Safety of Dams and reservoirs and diversions are operated in accordance with the California Fish and Game Code. Total storage capacity of the District's reservoirs is 169,000 acre-feet. Most of the stored water released from the reservoirs is delivered to streams below the dams. As the water flows downstream, some of it percolates through the streambed and recharges the groundwater subbasins. Some water may be diverted downstream for recharge in off-stream recharge facilities[4]. The District also operates and maintains several diversions to divert water to recharge facilities and enhance recharge. Additional detail on District reservoirs and recharge facilities is in Appendix C.

District recharge operations along streams have been modified in recent years to reflect environmental regulations and concerns, including the protection of native fisheries. In 1996, a complaint was filed with the State Water Resources Control Board (State Board) regarding District water rights licenses on Coyote Creek, Guadalupe River, and Stevens Creek. A cooperative effort between the District, the Complainant, wildlife agencies and stakeholders, the Fish and Aquatic Habitat Collaborative Effort (FAHCE), was convened. FAHCE undertook field investigations and other environmental studies resulting in the development of a draft settlement agreement (Settlement Agreement), which was initialed in May of 2003 by the District, the complainant, and the wildlife agencies, including the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (DFG).

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[3] Santa Clara Valley Water District, Protection and Augmentation of Water Supplies Report, February 2012.

[4] Santa Clara Valley Water District, FY 2012-2016 Water Utility Enterprise Operations Plan.

While the Settlement Agreement was not executed, it serves as a roadmap for future dam releases by the District and is intended to lead to resolution of water rights before the State Board. The Settlement Agreement specifies actions by the District to balance fisheries habitat and stream flow needs of the District such as groundwater recharge. The Settlement Agreement contains several conditions, including the receipt of incidental take permits from NMFS and DFG if required, and the preparation of a habitat conservation plan (HCP) for obtaining such permits. The District is preparing an HCP and will issue an Environmental Impact Statement and an Environmental Impact Report that will cover the HCP and the regulatory actions required to resolve the complaint.

When the Settlement Agreement is implemented, there may be impacts to groundwater recharge because the extent of wetted channel in three North County watersheds (Guadalupe River, Coyote Creek, and Stevens Creek) may change in order to ensure that the in-stream flow needs are met for steelhead trout and other aquatic species and habitat.

The District is currently assessing the seismic stability of its reservoirs and several reservoirs are currently subject to operating restrictions that reduce reservoir storage limits. These operating restrictions may impact groundwater recharge for facilities that depend on local water supplies since the amount of local water that can be captured is reduced.

In-Stream Managed Recharge

The District conducts in-stream managed recharge operations along approximately 110 miles of stream channel in over 30 creeks[2]. About two-thirds of the District's managed recharge occurs through in-stream recharge facilities, with over 60,000 AF recharged as a result of District releases into creeks in most years. As described previously, operation of the managed recharge system involves ongoing planning, monitoring, and inspection of facilities. The District also coordinates operations for flashboard dams and spreader dams under agreements with the California Department of Fish and Game.

Off-Stream Managed Recharge

The District conducts off-stream managed recharge operations in over 70 recharge ponds that range in size from less than 1 acre to more than 20 acres. Recharge through off-stream ponds accounts for about a third of the District's managed recharge, with over 30,000 AF of water delivered to recharge ponds in most years. As with in-stream recharge, water supply system operators continuously coordinate with program engineers, operations planning, and distribution system operators. Ongoing maintenance of off-stream ponds is conducted by removing accumulated fine sediments to maintain optimal recharge rates.

Treated Water Injection Pilot Project

The District's San Tomas Injection Well is a full-scale pilot direct injection facility, with a capacity of 750 AF per year. This facility is able to receive treated water for injection from the District's Rinconada Water Treatment Plant via the District's Campbell Distributary. The injection well is not currently in operation. However, it does provide another element of flexibility to the District's conjunctive use program.

Treated Groundwater Reinjection Program

Over the years, hundreds of thousands of acre-feet of groundwater have been extracted in Santa Clara County to control or mitigate contamination plumes caused by spills or leaks of hazardous materials. To facilitate the cleanup of contamination sites, protect groundwater resources, and minimize the discharge of local waters to storm drains or sanitary sewers, the District adopted Resolution 94-84 to encourage the reuse or recharge of treated groundwater from groundwater contamination cleanup projects. This program includes the review of applications against specific criteria to ensure that groundwater quality is protected and provides a financial incentive for qualifying projects.

4.1.2 In-Lieu Recharge

Although not as obvious a connection as the managed recharge program, the District's treated water sales and water conservation and recycling programs play a critical role in maintaining the groundwater basin storage by meeting water demand that would otherwise be met by groundwater.

Treated Water Operations

The District operates three drinking water treatment plants in the county, which operate 24 hours a day, 7 days a week and provide in-lieu recharge by reducing groundwater demands. The Rinconada Water Treatment Plant, which was constructed in 1967, has a maximum flow rate of 80 million gallons per day (MGD). The Penitencia Water Treatment Plant was constructed in 1974 and has a maximum flow rate of 40 MGD. The Santa Teresa Water Treatment Plant can process 100 MGD[5] and has been on line since 1989. In 2011, approximately 122,000 AF of treated water was delivered to retailers by the District[6].

Water Conservation

The District's water conservation programs for residents, businesses, and agriculture within the county include rebates, giveaways, surveys, direct installation programs, and outreach. These programs help the District to meet long-term water reliability goals as well as short-term demands placed on the water supply system during critical dry periods and/or regulatory drought. They reduce wastewater flows to Bay Area treatment plants, avoiding or deferring facility expansions while protecting the Bay's salt marsh habitat. Water conservation saves energy, reduces greenhouse gas emissions, and helps reduce the occurrence of demand reduction requirements placed on water retailers. The District's water conservation program[4] saved an estimated 52,500 AF of water in 2011[4].

Water Recycling

The District has also been providing financial incentives to recycled water producers since 1995 for recycled water used to displace potable water demand, and has entered partnership agreements with the South County Regional Wastewater Authority and South Bay Water Recycling to further promote recycled water use. Approximately 15,000 AF of recycled water was used 2011[4]. The District is currently constructing the Silicon Valley Advanced Water Purification Center, an advanced water treatment facility to be completed in early 2013 that will produce up to 10 million gallons per day. This near distilled-quality water will be blended into existing recycled water provided by South Bay Water Recycling, which will improve overall recycled water quality for irrigation and industrial purposes.

Longer term, the District anticipates using advanced treated recycled water for replenishment of groundwater basins, similar to the highly successful groundwater replenishment system that has been operated by the Orange County Water District for over 30 years. However, additional stakeholder and community input, technology testing, and research are necessary prior to beginning project-specific planning work.

4.1.3 Protection of Natural Recharge

The District's managed recharge program augments natural recharge, which is insufficient to meet groundwater demands. However, protecting natural recharge capacity is also important. Natural recharge is defined here as any type of recharge not controlled by the District, including: rainfall, subsurface seepage from surrounding hills, net irrigation return flows, net leakage from pipelines and septic systems, and net seepage into the groundwater basin. In 2011, natural recharge was estimated to be 40,000 AF[4].

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[5] Santa Clara Valley Water District, Urban Water Management Plan, 2010.

[6] Santa Clara Valley Water District, Protection and Augmentation of Water Supplies Report, February 2012.

District staff reviews land use plans for local cities and the county, encouraging the preservation of natural infiltration and reduction of impervious surfaces in the areas that contribute groundwater recharge to the principal aquifers.

4.1.4 Groundwater Production Management

The subbasins in Santa Clara County are not adjudicated and the District does not control the operation of groundwater wells or the amount of groundwater that wells can produce. The groundwater recharge program, treated water sales, recycled water partnerships and aggressive water conservation programs all offset demand on groundwater resources. Although the District does not restrict groundwater production, it utilizes several tools to influence it.

Groundwater Production Measurement

The amount of groundwater pumped from the groundwater subbasins is recorded in accordance with the District Act, which requires owners to register all wells within the District's groundwater management zones and to file production statements with the District on either an annual, semi-annual or monthly basis depending on the amount of water produced. Although approximately half of the wells within the county are not metered, metered wells extract the vast majority of the groundwater used. Where meters are not used, crop factors are used to determine agricultural water use and average values are used to estimate domestic use.

By District Board Resolution, meters are only installed at those sites determined to be economically feasible according to approved criteria or as required to facilitate the complete and accurate collection of groundwater production revenue. In the Santa Clara Plain, meters are required for facilities producing more than 4 AF of agricultural water or more than 1 AF of non-agricultural water annually. Within the Coyote Valley or Llagas Subbasin, meters are required for facilities producing more than 20 AF of agricultural water or more than 2 AF of non-agricultural water[7].

The District also tracks surface water, treated water and recycled water production within the county, and charges users volumetric rates. Water meter testing and maintenance are performed on a regular basis to ensure meters are performing accurately. When problems are discovered, meters are repaired or replaced. Meters are also replaced on a regular basis for testing and rebuilding.

Retailer Cooperation on Source Shifts and Drought Response

A very critical component of the water supply reliability performance depends on the cooperation of the District's water retailers, particularly in the implementation of programs that offset groundwater pumping such as water use efficiency and treated water deliveries. This cooperation has been critical during times of shortage.

In March 2009, the District Board of Directors adopted Resolution 09-25 calling for 15 percent mandatory water use reduction in response to a third consecutive dry year, court ordered pumping restrictions in the Delta, operational uncertainty, and declining local reserves. In July 2010, the Board extended the call for mandatory water use reduction for three months and decreased the quantity of water use reduction from 15 percent to 10 percent. In September 2010, the Board asked for 10 percent voluntary water use reduction through June 2011. The community responded well to the District's call for water use reductions and exceeded the goal by reducing water use by 19 percent from March 2009 through June of 2011. The steep reduction in water use was probably a result of the combined effects of a lingering economic recession, a wet spring in 2010 and 2011, and success of the District's water conservation outreach and coordination efforts with cities, retailers and the media[8].

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[7] Santa Clara Valley Water District, Board of Directors Resolution 91-53.

[8] Santa Clara Valley Water District, Protection and Augmentation of Water Supplies Report, February 2012.

Groundwater Zones and Groundwater Charges

The District has the authority to establish a zone or zones within which it can levy charges for all groundwater-producing facilities within the zone(s). The purpose of these charges is to fund District activities that protect and augment the water supplies for users within the zones. Creation or modification of charge zones can allow different levels of service within the District's service area, with water users in each zone paying appropriately for the services received. Per the District Act, groundwater charges can be used to pay for costs associated with for the following activities, as well as the principal or interest related to these costs:

- Constructing, maintaining and operating facilities to import water.
- Purchasing water for importation.
- Constructing, maintaining and operating facilities to conserve or distribute water, including facilities for groundwater recharge, surface distribution, and the purification and treatment of water.

Pricing Policies

In creating zones and setting water rates, the District utilizes several concepts as presented in Resolution 99-21, including water pooling and water resource management strategies. Under the District's pooling approach, water is considered a single commodity irrespective of the water's source or costs since all users benefit from the availability of multiple sources of water. The costs of the treated water facilities are pooled with all other costs within the zone of benefit, and recouped primarily through the basic user charge assessed to all water pumped from the groundwater subbasins or provided by District treated water deliveries. The treated water surcharge, paid by treated water users in addition to the basic user charge, is set by the District so as to influence its retailers in the choice between treated water purchases and groundwater extraction. For example, the District may offer treated water above contract delivery amounts at a discount to encourage retailers to offset groundwater pumping if water supply and groundwater storage conditions warrant it. This approach allows the greatest flexibility in water resources management, to the overall benefit of all water users in the county, even those that do not receive treated water.

4.1.5 Groundwater Level and Storage Assessment

District staff evaluates current groundwater levels and storage, and projects future groundwater supply conditions under various water supply scenarios to ensure the long-term viability of groundwater resources and the prevention of additional inelastic land subsidence. This analysis supports the District's conjunctive use programs, water supply operations, and water supply planning efforts. Specific activities include the use and maintenance of groundwater models as well as groundwater level and subsidence databases.

District programs that monitor, track, and evaluate rainfall, surface flows, recharge, and reservoir operations allow the preparation of a detailed surface water balance, which in turn provides data used by groundwater models including stage and flow data from stream flow stations, managed recharge estimates, and rainfall data. Along with groundwater pumping data, these data allow the District to project groundwater elevations and storage under different operations scenarios.

On a monthly basis, groundwater storage is calculated and groundwater levels at key locations are compared to subsidence thresholds. These thresholds are the groundwater levels that must be maintained to ensure a low risk of unacceptable land subsidence. This information is presented on a monthly basis in the District's Water Tracker Report, which is available on the District website.

Operations Planning to Meet Near-Term Needs

Each fall, the District initiates an annual operations planning process. Imported and local supplies are estimated and operations scenarios are developed for the following calendar year, using a number of different hydrologic projections. As the water year progresses and more information becomes available, the operations plans are revised accordingly. During the process, imported water deliveries, out-of-county water bank withdrawals or deposits, managed recharge operations, and local water releases to streams and the Bay are projected. If it appears that groundwater reserves will be drawn down below operational targets, then managed recharge operations may be increased where needed or treated water deliveries may be encouraged to offset groundwater pumping needs. In past droughts, the District has also worked with its water retailers to set demand reduction targets and increase conservation promotions to help protect the groundwater subbasins from overdraft.

Contingency Planning

The District's Urban Water Management Plan (UWMP)[9] includes water shortage contingency planning that recognizes groundwater carryover storage as a critical consideration in water supply reliability. An important component of meaningful shortage response is the ability to recognize a pending shortage before it occurs, early enough so that multiple options remain available and before supplies that may be crucial later have been depleted. Given the operational priorities of the District, projected end of the year groundwater carryover storage serves as the best single indicator of possible impending water shortages. The UWMP proposes guidelines for shortage response, based on groundwater storage. If the projected end of year total groundwater storage is anticipated to drop below 300,000 AF, then shortage response is called for, such as short-term water demand reduction programs. These short-term water demand reduction programs are in addition to on-going water conservation programs. The focus of the UWMP is not to define operating targets, but rather to identify at what point demand cutbacks or other response measures may be needed. Chapter 6 of this GWMP includes a breakdown of the 300,000 AF storage target by subbasin.

Planning to Meet Future Needs

The District's water supply plans, the UWMP and the Water Supply and Infrastructure Master Plan, evaluate water supply reliability and subsidence risk under future scenarios. Projections of future groundwater levels and storage are also performed to support other District planning efforts, including the evaluation of the feasibility of indirect potable reuse and wetland projects.

Every five years, urban water suppliers must prepare an UWMP assessing their water demands, supplies, and potential shortfalls over the next 20 years. The 2010 UWMPs show a continued reliance on groundwater in the future, with the Cities of San Jose and Santa Clara projecting large increases in groundwater use. Several retailers that do not typically use groundwater, including Palo Alto and Milpitas, also identify the potential use of wells for emergency backup supplies[10]. The District has increased its efforts to coordinate the water supply projections of its retailers, trying to reconcile the individual projections into a combined water supply future that meets the District's countywide water reliability goals. Water retailers deliver over 85% of the total water used in the county and nearly 95% of the water used in the Santa Clara Plain in northern Santa Clara County. The District's UWMP evaluates whether the projected groundwater use can be sustained over a 25-year planning horizon without risking subsidence or failing to meet water supply reliability targets. The District's UWMP highlights the importance of groundwater reserves, which are key in meeting demands in dry years. Multiple dry years pose the greatest challenge to the District's water supply, as storage reserves become depleted.

The purpose of the District's Water Supply and Infrastructure Master Plan (Water Master Plan) is to identify and plan the new water supply projects and programs that will be needed to ensure future water supply reliability over a 25-year planning horizon. Preparing the Water Master Plan includes developing objectives based on Board policy; performing a baseline system analysis to determine water supply and infrastructure needs; developing a

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[9] Santa Clara Valley Water District, Urban Water Management Plan, 2010.

[10] Per individual 2010 Urban Water Management Plans for water retailers in Santa Clara County.

recommended portfolio of projects and programs to meet those needs; conducting appropriate environmental analysis; engaging stakeholders in plan development; and preparing a schedule and budget for implementing the recommended portfolio. The Water Master Plan will be updated at least every five years to reflect current conditions.

District staff also reviews certain Environmental Impact Reports and other environmental documents from land use agencies for water supply impacts. With the passage of SB 610 amending the Urban Water Management Planning Act[11] in 2001, coordination has become more critical and is required for development decisions that meet certain thresholds. This amendment and other later amendments have strengthened the provisions requiring that a reliable water supply be secured before new development projects are approved. The District has been working closely with retailers and cities to address these water supply assessments and other issues.

4.1.6 Groundwater for Emergency Backup Supply

Groundwater reserves are the county’s best protection against droughts or other outages. As described above, several local water retailers address the potential use of groundwater as a backup supply for other water sources in their Urban Water Management Plans. The District does not currently operate groundwater wells and is not able to substitute groundwater for surface water. However, the District is pursuing well fields that will tie directly to the treated water distribution system for increased operational flexibility and system reliability. In 2005, the District completed a study to evaluate the reliability of the treated water distribution system during earthquakes or other disasters[12]. The study recommended a portfolio of projects, including the construction of well fields to provide backup supply to the treated water distribution system. An implementation plan was developed in 2009 in coordination with many water retailers. The District and retailers are considering potential options to reduce costs, including the potential use of existing water retailer wells to backup the District’s treated water system. A pilot facility, the Campbell Well Field, is currently being constructed by the District.

4.1.7 Asset Management

Maintaining the integrity of the District’s existing infrastructure is essential to securing the reliability of the District’s water supply. This includes maintaining the existing capacity of recharge facilities and ensuring that other facilities, such as reservoirs, treatment plants, and conveyance and distribution infrastructure are safeguarded. The District maintains a rigorous asset management framework to reduce unplanned disruptions of services and assure reliability of water supply infrastructure. The program helps to minimize operating and capital costs associated with owning assets, enable accurate financial planning to sustainably deliver services, and capture and transfer knowledge and experience to effectively plan for succession[13].

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[11] California Water Code Section 10610.

[12] Santa Clara Valley Water District, Water Infrastructure Reliability Report, May 2005.

[13] Santa Clara Valley Water District, FY 2012-2016 Water Utility Enterprise Operations Plan.

4.2 PROGRAMS TO PROTECT GROUNDWATER QUALITY

This section presents a description of the activities performed by the District and other entities that address groundwater quality protection in Santa Clara County. In addition, the District monitors emerging policy and regulatory trends; collaborates with key decision makers and stakeholders to effect policy change; and works with Federal, State, and Local government representatives on pending legislation or regulatory standards related to the protection of groundwater quality. The purpose of these activities is to ensure that District interests are communicated and considered in legislative and regulatory processes.

4.2.1 Water System Quality Requirements

Local water retailers deliver the majority of groundwater used within the county to consumers. In order to ensure that tap water is safe to drink, the USEPA and CDPH prescribe regulations that limit the amount of certain constituents in water provided by public water systems. Water retailers perform numerous water quality tests throughout their distribution systems to ensure that the water they serve is healthful and of high quality. Water retailers provide these results to consumers in annual water quality reports.

To evaluate regional groundwater quality conditions, the District assesses annual monitoring data collected by water retailers and by the District. Monitoring results are compared against drinking water standards and agricultural objectives and are evaluated for potentially adverse trends so that appropriate action can be taken to protect groundwater quality. This information is presented in the District's annual Groundwater Quality Report, which is available on the District website.

4.2.2 Well Ordinance Program

The District Act authorizes the District to prevent the contamination, pollution, or otherwise rendering unfit for beneficial use the surface or subsurface water used or useful in the county[14]. As part of its efforts in exercising this authority, the District developed a well ordinance to protect groundwater resources from contamination. The objective of the Well Ordinance Program is to ensure that wells and other deep excavations are properly constructed, maintained and destroyed so that they will not allow the vertical transport of waters of poor quality into deeper aquifers used for drinking water. Abandoned and unused wells are required to be sealed in accordance with the District Well Ordinance. The District is authorized to take civil action to abate a public nuisance caused by wells creating a water contamination hazard.

Each year, the District permits and inspects approximately 1,500 exploratory borings, well destructions, and water supply and monitoring well installations under the Well Ordinance Program[15]. Through this program, the District:

- Develops standards for the proper construction, maintenance, and destruction of wells and other deep excavations.
- Informs the public, including contractors, consultants and other government agencies about the Well Ordinance and the well standards.
- Verifies that wells are properly constructed, maintained and destroyed using a permitting and inspection mechanism.
- Takes enforcement action against violators of the Well Ordinance.
- Maintains a database and well mapping system to document information about well permitting, well construction and destruction details, a well's location, and well status.

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[14] Santa Clara Valley Water District Act, Water Code Appendix, Chapter 60, Section 5(5)

[15] Santa Clara Valley Water District, FY 2012-2016 Water Utility Enterprise Operations Plan.

4.2.3 South County Private Well Testing

Although public water supply systems are required to regularly test their wells for compliance with CDPH regulations, no such regulation exists for private domestic wells. Elevated nitrate is an ongoing groundwater protection challenge due to historic and ongoing sources including fertilizers, septic systems, and animal waste. To better understand the occurrence of nitrate and to help well owners better understand their water quality, the District has implemented several limited duration programs offering free nitrate testing for private well owners in the Coyote Valley and Llagas Subbasin (South County).

In 1998, the District sampled over 600 private wells to obtain data on nitrate and found that over half of the wells tested exceeded the CDPH Maximum Contaminant Level of 45 milligrams per liter[16]. In 2011, the District budget included the South County Water Quality Testing Program that expanded upon the previous nitrate testing program to also include other basic water quality parameters including electrical conductivity, hardness, and bacteria. The program benefits the District by providing more localized information on nitrate and other constituents to supplement regional groundwater monitoring data for better evaluation of hot spots and trends. This pilot testing program also provides basic water quality information to domestic well owners who may be exposed to elevated nitrate or harmful bacteria.

4.2.4 Vulnerability Assessment

Groundwater Vulnerability Studies

In 1985, the San Francisco Regional Board completed a vulnerability study[17], which rated 105 hazardous materials release sites in terms of groundwater pollution potential based on the distance to wells and depth to water as well as the severity of the contamination. The study focused on existing contamination sites and did not consider potentially contaminating activities.

In 1999, the District completed an evaluation of the sensitivity of the groundwater subbasins based on its intrinsic or hydrogeologic characteristics using the USEPA DRASTIC methodology[18]. The DRASTIC evaluation resulted in a Geographic Information System (GIS) coverage which presents the relative sensitivity of different parts of the subbasins to contamination[19].

In October 2010, the District completed a comprehensive groundwater vulnerability study[20] to assess the vulnerability of groundwater subbasins to land use activities. This study updated the previous sensitivity study, incorporating recent hydrogeologic data and a statistical (rather than subjective) weighting approach. It also evaluated the vulnerability of the subbasins to different land uses. The study findings and related GIS tool have been used to help prioritize District work (including the review of high-threat contamination sites) and optimize the groundwater quality monitoring network. The District has also met with several land use and regulatory agencies to discuss the potential use of the GIS tool to assist in their groundwater protection efforts.

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[16] Santa Clara Valley Water District, Private Well Water Testing Nitrate Data Report, December 1998.

[17] San Francisco Water Board, Sanitary Engineering and Environmental Health Research Laboratory, University of Berkeley, and Santa Clara Valley Water District, Assessment of Contamination from Leaks of Hazardous Materials in Santa Clara Groundwater Basin, 205j Report, June 1985.

[18] U.S. EPA, DRASTIC: A Standardized System for Evaluating Ground Water Pollution Potential Using Hydrogeologic Settings, 1987.

[19] Santa Clara Valley Water District, an Analysis of the Sensitivity to Contamination of the Santa Clara Valley Groundwater Aquifers Based on the USEPA DRASTIC Methodology, 1999.

[20] Todd Engineers and Kennedy/Jenks Consultants for Santa Clara Valley Water District, Revised Final Groundwater Vulnerability Study, Santa Clara County, California, October 2010.

Drinking Water Source Assessment and Protection Program (DWSAP)

The goals of the state's DWSAP required under the 1996 reauthorization of the federal Safe Drinking Water Act are as follows:

- Protect public water systems
- Improve drinking water quality and support effective water resources management
- Inform public and drinking water systems of contaminants and potential contaminating activities that have the potential to affect drinking water
- Promote a proactive approach to protecting drinking water quality and enable communities and drinking water systems to protect water quality
- Refine and focus drinking water source monitoring requirements
- Focus pollution prevention and clean-up on areas that are subject to more serious threats

The District assisted many of the local water retailers in their initial compliance with the state's DWSAP requirements in 2002 and 2003. The assessments included delineating the protection area, inventorying possible contaminating activities and analyzing the vulnerability of the source. The District developed a GIS based application, which was used to delineate protection areas in accordance with state guidelines. In addition, the District shared the application with the state DWSAP data advisory committee. Local water retailers are responsible for completing the DWSAP for any newly installed wells.

4.2.5 Coordination with Land Use Agencies

Land Use Review

As land uses intensify, so can the potential for contaminating the underlying groundwater resource. In highly urbanized areas such as the Bay Area, there are numerous threats to groundwater resulting from commercial, industrial, and residential development including urban runoff, industrial chemicals, and underground storage tanks. Residential and agricultural use of nitrogen based fertilizers and pesticides can also impact groundwater quality.

Land use decisions fall under the authority of the local cities and the County. These agencies, the District, and the water retailers all share an interest in maintaining the water resources that serve the current and future land uses. These agencies work together to try to ensure that groundwater is adequately protected from potentially contaminating activities. Of particular concern are potentially contaminating activities over groundwater recharge areas, which are more vulnerable to contamination due to the presence of more permeability materials and higher groundwater flow rates.

The District reviews some local land use and development plans to identify threats to groundwater and watercourses under District jurisdiction and to other District facilities. The District provides review and comment on proposed land development documents, environmental documents and city and County General Plans. The District has also worked with land use agencies to develop guidelines or model ordinances for specific issues such as the permitting of graywater systems. The District works with the project and regulatory stakeholders to try to ensure that these projects are implemented such that groundwater resources are protected.

Septic Systems

The installation of septic systems is overseen by the County Department of Environmental Health (DEH). Permits are only issued in those areas of the county where a sanitary sewer is not available within 300 feet of the property line (within 200 feet of the building in some cities). Onsite sewage disposal systems cannot be used if soil conditions, topography, high groundwater water or other factors indicate that this method of sewage disposal is unsuitable. DEH has developed sewage disposal system requirements[21] that describe the requirements for development, site evaluation, septic system siting, and installation. Various permits are required in order to install a septic system and the systems are inspected prior to approving completion of the installation.

Recently, the County has initiated the process to update the ordinance regulating onsite wastewater treatment systems. As part of this effort, the County is reviewing existing ordinances, policies, procedures, and practices. They are also evaluating the feasibility of incorporating selected types of alternative wastewater treatment systems into an updated ordinance code. The County has assembled a Wastewater Advisory Group to participate in the review and update process and the District has been an active participant in this group.

4.2.6 Coordination with Regulatory Agencies

Sites with releases of solvents, toxics, fuels or other contaminants pose a threat to groundwater quality since contamination may migrate laterally or vertically into areas or zones that were previously unaffected. If allowed to migrate, such contamination may eventually impact groundwater production wells, forcing well operators to cease operation, implement expensive wellhead treatment, or blend the affected water with other sources of water to dilute the contaminant. In addition, the degradation in water quality can limit the water’s beneficial uses and alter plans for production well siting or design.

Hazardous Material Handling and Storage Oversight

The primary causes of groundwater contamination at hazardous material release sites are the improper handling of hazardous materials or leaking storage tanks. Permitting and inspection related to the handling and storage of hazardous materials is overseen by the local or county fire department. The fire departments also oversee the installation, operation, and removal of all underground and above ground storage tanks and associated piping, and notify the DEH and/or Regional Boards in the event that contamination is discovered.

Contaminant Release Sites

There are more than 2,600 fuel leak releases and 800 sites[22] with non-fuel contamination within Santa Clara County, as summarized in Tables 4-1 and 4-2. Fuel leak cases are overseen by the County DEH while the oversight agencies for the non-fuel leak sites vary, as shown in Table 4-2.

As the county’s groundwater management agency, the District works with these agencies to protect groundwater resources. Current District interaction with regulatory agencies on point-source cases is mainly focused on the highest threat cases in the county or is in response to specific requests from the agencies.

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[21] County of Santa Clara Department of Environmental Health, Sewage Disposal System Requirements, Bulletin A, March 2010.

[22] Fuel leak case summary based on information accessed from the State Water Resources Control Board Geotracker database March 2012. Non-fuel contamination site information is based on District records.

Table 4-1 Summary of Leaking Underground Fuel Tank Sites

Open Case Status	Number of Cases	Percent of Open Cases
Site Assessment	149	56%
Assessment and Interim Remediation	9	3%
Remediation	55	21%
Verification Monitoring	55	21%
Totals		**Percent of Total Cases**
Open	268	10%
Completed – Case Closed	2,365	90%
Grand Total	2,633	

Table 4-2 Summary of Non-Fuel Contamination Sites

Oversight Agency	Status		Total
	Closed	Open	
San Francisco Bay Water Board	274	365	639
California Department of Toxic Substance Control	54	70	124
Environmental Protection Agency	1	28	29
Santa Clara County Department of Environmental Health	4	16	20
Central Coast Regional Water Quality Board	5	9	14
City of San Jose		2	2
Unknown		2	2
Integrated Waste Management Board		1	1
Santa Clara County	1		1
Santa Clara County Fire Department		1	1
Grand Total	339	494	833

4.2.7 Public Outreach

Public outreach is an important component of the District's groundwater protection efforts. Because groundwater is far removed from the public's view, it can be a challenge to make the connection that actions occurring on the land surface can impact groundwater quality. To increase public awareness of groundwater resources, the District conducts active public outreach programs, which are described in this section. Each year, the also District celebrates Groundwater Awareness Week, which is an annual observation of the importance of groundwater and is celebrated by the National Groundwater Association, the U.S. Environmental Protection Agency, and other organizations advocating groundwater protection.

Outreach Materials

The preparation of pamphlets, fact sheets, and summary reports helps to transmit key messages related to groundwater. The District's Guide for the Private Well Owner, which is provided to all new well owners, describes the basics of proper well construction, maintenance, and testing. The District also produces fact sheets to address specific issues, such as nitrate or chromium-6, or to summarize the results of groundwater studies, like the Recycled Water Irrigation and Groundwater Study.

School Program

The District believes it is never too early for children to begin understanding and appreciating their local water resources. To help promote that awareness, the district offers a full range of educational programs for both teachers and students. From puppet plays for kindergarteners to workshops for educators, school outreach projects provide effective, hands-on learning experiences that meet new state standards. Through the district's educational programs, students can tour a groundwater recharge facility, create a simulated pond or explore the plant and animal life in a creek. All activities are geared for specific grade levels, from pre-kindergarten to college.

Groundwater Guardian Program

The Groundwater Guardian Program is sponsored by the Groundwater Foundation, a not-for-profit education organization that strives to increase groundwater awareness. Groundwater Guardian is an annually earned designation for communities and affiliates that take voluntary, proactive steps toward groundwater protection. The District has been designated a Groundwater Guardian based on such activities as conducting irrigation and nutrient management seminars, creating a prototype zone of contribution delineation tool for wellhead protection areas, and conducting the school program. The District will continue to participate in the program by submitting annual work plans for groundwater protection activities and submitting reports documenting our groundwater protection efforts. The District was designated as Groundwater Guardian Affiliate in 2000 and has maintained that designation each year since then.

4.3 Programs Related to Surface Water/Groundwater Interaction

The District has been conducting managed recharge with locally captured and imported water to the aquifers for many decades. The District has been recharging local water into the aquifers since the 1920s and water imported from the Bay-Delta since the 1960s. The District's managed recharge program is an important management tool that has contributed to aquifer storage recovery, cessation of unacceptable levels of inelastic land subsidence, prevention of salt water intrusion, and improved water quality in impacted areas. A reliable water supply for the county depends on this interaction between surface water and groundwater, and as such, the District closely monitors recharge operations.

The addition of water through managed or incidental recharge can change groundwater quality. This may be for the better by diluting existing contaminants in the aquifer, or for the worse by introducing contaminants. Incidental recharge includes water applied to landscape and agriculture in excess of plant uptake (irrigation return flows), as well as infiltration from stormwater and septic systems.

District programs related to surface water/groundwater interaction are described below.

4.3.1 Salt and Nutrient Management

The most significant non-point source contaminant in Santa Clara County is nitrate. Since the 1990s, the District has implemented nitrate management activities in the Coyote Valley and Llagas Subbasins to ensure the long-term viability of groundwater as a healthful water supply. The goal of these efforts is to reduce the public's exposure to high nitrate concentrations, reduce further loading of nitrate, and monitor the occurrence of nitrate. The District's recharge operations serve to dilute existing nitrate concentrations and focused outreach materials and workshops related to rural land use and groundwater protection also support the District's nitrate management objectives.

District programs for conservation in the agricultural sector benefit salt and nutrient management efforts since improved irrigation efficiency may reduce the transport of these constituents to groundwater.

While applied irrigation water from any source may contribute salts and nutrients, recycled water generally has a higher concentration of these contaminants than groundwater or treated water. The District works to support expanded recycled water use while protecting groundwater quality through various salt and nutrient management activities described below.

Salt and Nutrient Management Plans

In 2009, the State Water Resources Control Board adopted a policy for water quality control for recycled water (Resolution 2009-0011). A major component of this policy is the requirement for regional Salt and Nutrient Management Plans (SNMPs) as “the appropriate way to address salt and nutrient issues.” The SNMPs address salt and nutrient loading to groundwater subbasins that may arise from use of recycled water, imported water, agricultural activity, and other sources, and evaluate the overall salt balance in the groundwater subbasins. The District is working with local stakeholders to develop two SNMPs, one for the Santa Clara Subbasin (in coordination with the San Francisco Bay Regional Board) and one for the Llagas Subbasin (in coordination with the Central Coast Regional Board). The plans, which are expected to be completed in 2014, will include: salt and nutrient source identification, a fate and transport analysis, salt and nutrient loading and assimilative capacity estimates, water recycling and stormwater recharge/reuse goals and objectives, implementation measures, a groundwater monitoring plan, and an anti-degradation analysis.

Recycled Water Irrigation Evaluation

Recycled water generally has a higher concentration of salts, nutrients, disinfection byproducts, and emerging contaminants than groundwater or treated water, and these contaminants may be introduced to groundwater through landscape irrigation. Recycled water used within the county undergoes tertiary treatment and is currently used only for non-potable uses like large landscape irrigation, agriculture, and industry. With the exception of the Evergreen and Edenvale areas of San Jose and portions of the Llagas Subbasin in Gilroy, all current use of recycled water is limited to the confined zones, where significant clays and silts offer a measure of natural protection to deeper drinking water aquifers.

Several groundwater monitoring efforts and studies provide data to help assess potential changes to groundwater quality resulting from the irrigation of tertiary treated recycled water. The District evaluates groundwater monitoring data collected for the South Bay Water Recycling Program, which indicates increasing trends for several inorganic constituents, including chloride and boron, following recycled water application[23].

In August 2011, the District’s completed the Recycled Water Irrigation and Groundwater Study[24] to evaluate the potential effects of recycled water used for irrigation on groundwater quality in the Santa Clara and Llagas Subbasins and to identify best management practices to protect groundwater. The study included laboratory testing of soils irrigated with recycled water and an 18-month field study at a site using recycled water for irrigation in the Santa Clara Plain. The study found no significant change in groundwater quality for most constituents monitored. However, some changes were noted, including the presence of a few constituents not previously found in shallow groundwater at the site. A common by-product of the water disinfection process, N-Nitrosodimethylamine (NDMA), was detected in groundwater 30 feet below the surface at trace levels of 3 to 4 parts per trillion (ppt) during the study. Subsequent sampling has indicated levels of up to 8.5 ppt. The study findings suggest that best management

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[23] Santa Clara Valley Water District, City of San Jose South Bay Water Recycling Groundwater Data Evaluation, May 2008.

[24] Locus Technologies for Santa Clara Valley Water District, Recycled Water Irrigation and Groundwater Study, Santa Clara and Llagas Groundwater Subbasins, Santa Clara County, California, August 2011.

practices and/or changes in recycled water treatment may be warranted when irrigating with recycled water over sensitive parts of the Santa Clara Plain or Llagas Subbasin.

As the shallow and unconfined Coyote Valley is highly vulnerable to contamination, the District has determined that all recycled water applied in that area must be advanced treated to avoid groundwater quality impacts. This determination was made during District review of the Coyote Valley Specific Plan, a large proposed development in the Coyote Valley which has since been postponed indefinitely.

4.3.2 Stormwater Management

To reduce the amount of runoff to creeks and other surface water bodies, urban runoff programs are increasingly encouraging the infiltration of runoff into on-site stormwater infiltration devices (SWIDs). Infiltration of runoff helps reduce peak flows and protect surface water quality. Stormwater can be a beneficial source of groundwater recharge in some areas, but there are potential groundwater quality impacts. Stormwater can pick up pollutants as it runs over the ground surface, which can then migrate to groundwater through infiltration.

The District is part of the Santa Clara Valley Urban Runoff Management Program, which was formed in 1990 to develop and implement efficient and uniform approaches to control non-point source pollution in stormwater runoff that flows to the South San Francisco Bay. The District has worked with the other co-permittees of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) to develop SWID guidelines that allow stormwater infiltration while being adequately protective of both surface water and groundwater resources.

Dry wells are a type of SWID that reduce or eliminate the vertical separation between the infiltration point and groundwater. Because they bypass natural filtering capacity of soils, dry wells are of special concern. Specific standards for dry wells are planned to be incorporated into the next revision to the District Well Standards. The purpose of revising the policy is to clarify permitting and construction standards for dry wells, to expand the definition of devices covered by the Well Standards so that all wells that bypass natural protection processes are subject to standards for protecting groundwater, and to simplify the process by which dry wells are permitted.

4.3.3 Salt Water Intrusion Prevention

The movement of saline water into a freshwater aquifer constitutes saltwater intrusion. This potential exists in groundwater basins adjacent to the sea or other bodies of saline water – in this case, San Francisco Bay. Once freshwater aquifers experience severe saltwater intrusion, it is extremely difficult and costly to reclaim them. Salt water intrusion is driven by groundwater gradients that reverse the normal flow of water out into the bay.

With much higher groundwater pumping and land subsidence in the decades after World War II, salt water intrusion was observed in the shallow aquifer through an area bounded on the south by Highway 101 and Interstate 880. This was mainly caused by the inland migration of saline water through tidal creeks and subsequent transport to groundwater through streambed percolation or the presence of abandoned wells due to downward vertical gradients between shallow and principal zones.

Historically, the District conducted an extensive program of locating and properly destroying abandoned wells in the northern Santa Clara Subbasin along the Bay, so that these wells would not act as conduits for salt water intrusion of the principal aquifer. The District adopted Ordinance 85-1, which gave the District authority to require owners of wells determined to be “public nuisances” to seal and destroy the wells or upgrade them to active or inactive status. The District engaged in a more comprehensive well sealing program from 1984 to 2005 to provide financial assistance to properly destroy abandoned wells near areas of known contamination to prevent contamination of drinking water supplies. Although this assistance program has ended, the District still requires abandoned or unused wells to be sealed in accordance with District and State well standards and takes action as authorized by the District Well Ordinance.

The resumption of land subsidence the greatest potential threat to aggravating saltwater intrusion, as it would further depress the land surface fronting South San Francisco Bay. This would increase the inland hydraulic gradient, exposing a larger portion of the shallow aquifer to intrusion from the greater inland incursion of tidal bay waters. A lowering of the hydraulic head in the principal confined aquifer also increases the potential for salinity intrusion. The District's managed recharge program is critical to maintaining hydraulic heads in the aquifers connected to the Bay, which helps protect the long-term viability of the aquifers from salinity intrusion. As described in Section 5, the District actively monitors land subsidence, groundwater elevations, and groundwater quality to ensure risks related to salt water intrusion are minimized.

4.3.4 Water Accounting

As described in Section 4.1.1, the District uses local and imported surface water to conduct an active managed recharge program to recharge groundwater supplies. Many other District programs are needed to support the recharge program, including programs related to dam maintenance, the administration and management of imported water contracts, local water rights management, and maintenance of the raw water conveyance system.

To reconcile all measured imported water, inflows, releases and changes in surface water storage, a periodic water balance is performed. The results of this balance become the final accounting for distribution and facility processing. The data is used for water rights reporting, accounting for usage of federal water, for facility performance measurement purposes, and for the groundwater subbasin water budget which is integral to the District's annual Protection and Augmentation of the Water Supplies Report. This report establishes the recommended water rates for the next year based on anticipated costs to meet the projected water need.

4.3.5 Watershed Management

Since the majority of surface water collected and stored in the watersheds and reservoirs drain into creeks and recharge ponds, the protection of these source waters is paramount to protecting groundwater. The protection of the watersheds' water quality is also vital to assuring a healthy environment for their inhabitants. The District seeks to balance watershed uses, such as the rights of private property owners and public recreational activities, with the protection and management of natural resources. The District recognizes that preserving beneficial watershed uses can benefit reservoir water quality, which in turn benefits water quality delivered to the District treatment plants and recharged into the groundwater subbasins.

The District works to protect the water quality and supply reliability of the District's reservoirs through regular monitoring, coordination with external agencies on source water quality issues, and efforts to protect local reservoirs from potentially contaminating activities. The District also implements projects to evaluate and prioritize actions to address pollutants affecting freshwater, such as mercury.

The District has also developed guidelines and standards for land use near streams in cooperation with local cities, the county, local businesses, agriculture, streamside property owners, and environmental interests through the Water Resources Protection Collaborative. Participation in other collaborative, stakeholder-driven efforts such as the Santa Clara Basin Watershed Management Initiative also strive to balance the objectives of water supply management, habitat protection, flood management, and protection of water quality.

Programs and activities supporting basin management objectives and strategies are shown below in Tables 4-3 and 4-4, respectively.

Table 4-3 Relation of Programs and Activities to Basin Management Objectives

Program/Activity	BMO 1: Water Supply Reliability and Minimization of Land Subsidence	BMO 2: Groundwater Quality Protection
Managed recharge • Reservoirs and diversions (P) • In-stream and off-stream managed recharge (P) • Treated water pilot injection (P) • Treated groundwater reinjection program (P, C)	X	X
In-lieu recharge • Treated water operations (P) • Water conservation (P, C) • Water recycling (P, C, T)	X	X
Protection of natural recharge (P, C, T)	X	
Groundwater production management • Production measurement (P) • Retailer coordination on source shifts and drought response (P, C) • Groundwater charges and zones (P) • Pricing policies (P)	X	
Groundwater level and storage assessment • Operations planning to meet near-term needs (P) • Contingency planning (P) • Long-term water supply planning (P, C)	X	X
Groundwater for emergency backup supply (P, C)	X	
Asset management (P)	X	X
Water system quality requirements (C)		X
Well ordinance program (P)		X
South County private well testing (P)		X
Vulnerability assessment • Groundwater vulnerability studies (P, C) • Drinking Water Source Assessment and Protection (C, T)		X
Coordination with land use agencies • Land use reviews (C, T) • Septic systems (C, T)	X	X
Coordination with regulatory agencies • Contamination release sites (C, T) • Hazardous materials handling and storage oversight (C, T)		X
Public outreach • Outreach materials (P) • School program (P, C) • Groundwater Guardian (P)	X	X
Salt and nutrient management • Salt and Nutrient Management Plans (P, C) • Recycled water irrigation evaluation (P, C)	X	X
Stormwater management (C, T)		X
Salt water intrusion prevention (P)	X	X
Water accounting (P)	X	X
Watershed management (P, C)	X	X

(P) Indicates that the District has primary jurisdiction and/or responsibility; (C) for cooperation or coordination with others; and (T) for providing technical information and/or serving as advocate

Table 4-4 Relation of Programs and Activities to Basin Management Strategies

Program/Activity	Strategy			
	1	2	3	4
Managed recharge • Reservoirs and diversions (P) • In-stream and off-stream managed recharge (P) • Treated water pilot injection (P) • Treated groundwater reinjection program (P, C)	X	X	X	
In-lieu recharge • Treated water operations (P) • Water conservation (P, C) • Water recycling (P, C, T)	X		X	
Protection of natural recharge (P, C, T)			X	X
Groundwater production management • Production measurement (P) • Retailer coordination on source shifts and drought response (P, C) • Groundwater charges and zones (P) • Pricing policies (P)	X	X	X	
Groundwater level and storage assessment • Operations planning to meet near-term needs (P) • Contingency planning (P) • Long-term water supply planning (P, C)	X		X	
Groundwater for emergency backup supply (P, C)	X		X	
Asset management (P)	X	X	X	
Water system quality requirements (C)		X	X	
Well ordinance program (P)		X		X
South County private well testing (P)		X	X	X
Vulnerability assessment • Groundwater vulnerability studies (P, C) • Drinking Water Source Assessment and Protection (C, T)		X	X	X
Coordination with land use agencies • Land use reviews (C, T) • Septic systems (C, T)	X	X		X
Coordination with regulatory agencies • Contamination release sites (C, T) • Hazardous materials handling and storage oversight (C, T)		X		X
Public outreach • Outreach materials (P) • School program (P, C) • Groundwater Guardian (P)	X	X	X	X
Salt and nutrient management • Salt and Nutrient Management Plans (P, C) • Recycled water irrigation evaluation (P, C)		X	X	X
Stormwater management (C, T)	X	X		X
Salt water intrusion prevention (P)	X	X	X	X
Water accounting (P)	X		X	
Watershed management (P, C)		X		X

(P) Indicates that the District has primary jurisdiction and/or responsibility; (C) for cooperation or coordination with others; and (T) for providing technical information and/or serving as advocate

Strategy 1: Manage groundwater in conjunction with surface water through direct and in-lieu recharge programs to sustain groundwater supplies and to minimize salt water intrusion and land subsidence.
Strategy 2: Implement programs to protect or promote groundwater quality to support beneficial uses.
Strategy 3: Maintain and develop adequate groundwater models and monitoring systems.
Strategy 4: Work with regulatory and land use agencies to protect recharge areas, promote natural recharge, and prevent groundwater contamination.

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5 2012 GROUNDWATER MANAGEMENT PLAN
Monitoring Programs and Protocols

The District conducts a wide range of activities to support water supply reliability and maintain groundwater quality, and to avoid further land subsidence. Assessing how well these activities are meeting the Basin Management Objectives requires a reliable monitoring program to ensure that the groundwater management activities are effective and efficient. This chapter describes programs to monitor groundwater levels, land subsidence, surface water and groundwater quality, as well as the availability of data collected under these programs.

5.1 Groundwater Level Monitoring

To obtain comprehensive and accurate measurements of groundwater levels, the District collects depth to water data from up to 364 wells at varying frequencies. The District regularly measures approximately 222 wells each year to obtain groundwater levels. In addition, water retailers provide water levels from approximately 142 water supply wells.

Monitoring well locations and measurement frequencies have evolved over many years in response to data requirements to support groundwater flow modeling, gauging and forecasting groundwater supply, and efforts to monitor recharge operations, areas of concentrated pumping, and land subsidence. Monitoring frequency is based on data requirements, with wells measured biweekly, monthly, quarterly, annually, or even hourly (using transducers and dataloggers).

The District's groundwater level monitoring network consists of depth-discrete monitoring wells (including multi-level or "nested" monitoring wells) and water supply wells with single or multiple perforated zones of varying lengths. The variety of monitoring well types employed by the District to measure groundwater levels ensures that the data obtained is flexible enough to serve different purposes, including assessment of regional conditions or analysis of particular aquifer zones.

In 2008, the District deployed pressure transducers and data loggers in 87 wells. At 26 locations comprising 46 wells or discrete-depth monitoring points, telemetry equipment was installed to permit remote retrieval of water level data by cellular phone contact and satellite uplink.

The specific schedule of monitoring wells and measurement frequencies is determined based on well availability, well characteristics, and program efficiency. The locations of wells used in the District's groundwater level monitoring program in 2011 for the Santa Clara and Llagas Subbasins are displayed in Figures 5-1 and 5-2.

In 2009, the Governor signed SBX7 6, which established the California Statewide Groundwater Elevation Monitoring (CASGEM) program under DWR. The law requires that statewide groundwater level monitoring be implemented to determine seasonal and long-term trends in groundwater elevations. Local agencies may take on the responsibility for data collection and reporting to DWR. As the local groundwater management agency with a well-established and robust groundwater level monitoring network, the District will serve as the designated monitoring entity for the subbasins in Santa Clara County and will regularly report water level data for 107 District-owned monitoring wells.

Figure 5-1 2011 District Groundwater Level Monitoring – Santa Clara Subbasin

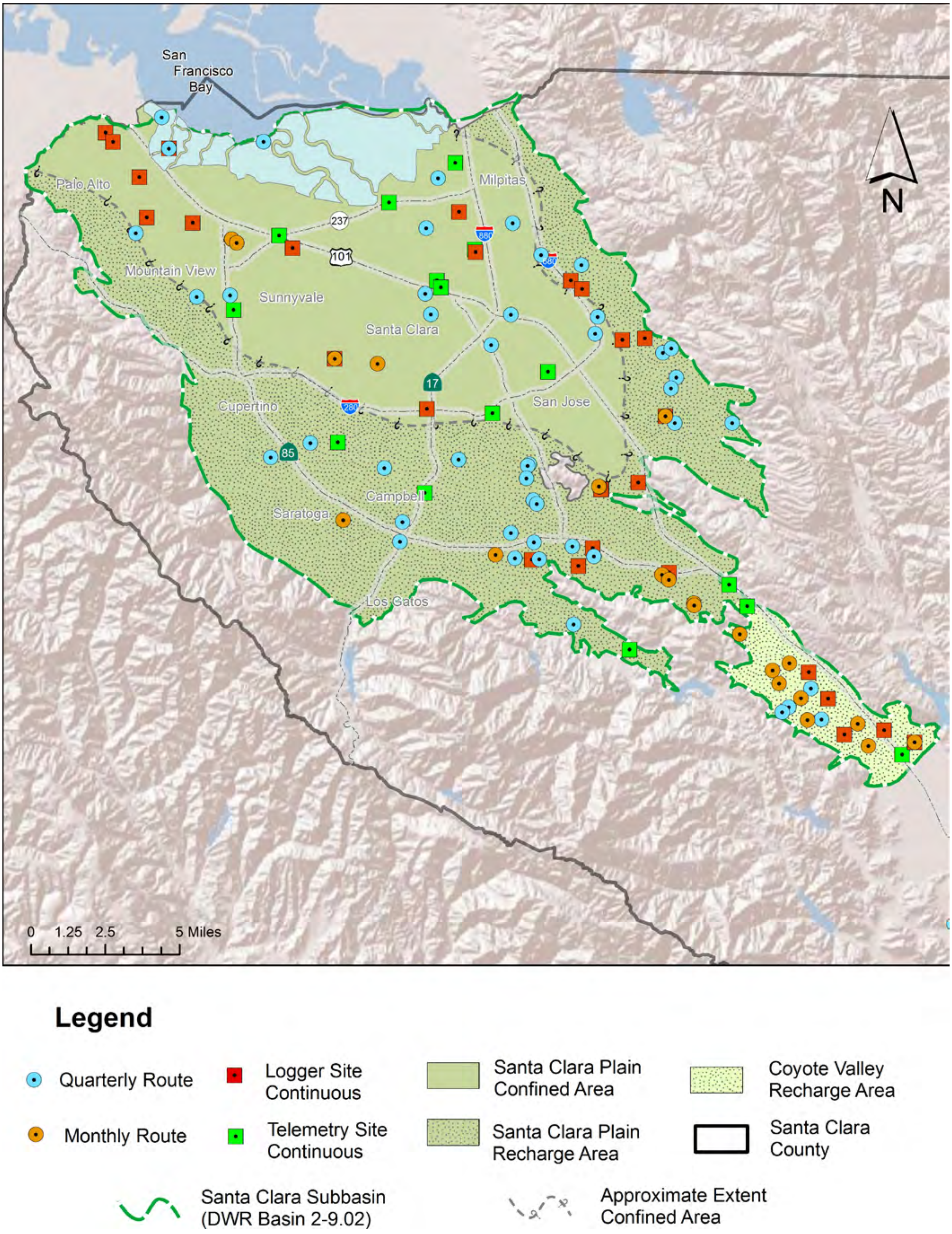
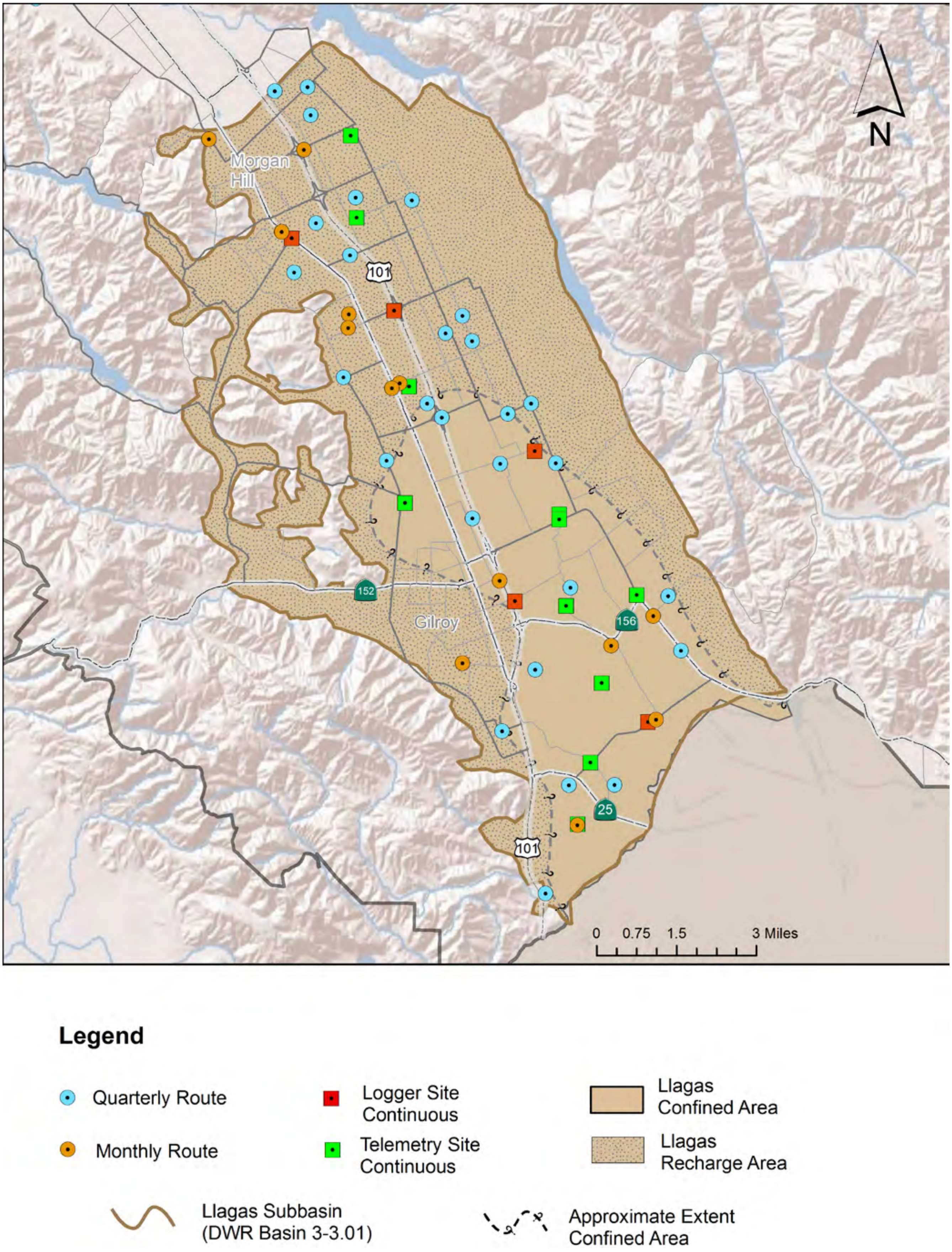


Figure 5-2 2011 District Groundwater Level Monitoring – Llagas Subbasin



5.2 Land Subsidence Monitoring

The District conducts annual monitoring of land surface elevation benchmarks and continuous monitoring of extensometers to determine if land subsidence is occurring or is threatening to exceed established subsidence thresholds. Monitoring of land subsidence is performed by annual spirit leveling of three established routes, and continuous measurement of vertical ground movement at two extensometers (also called compaction recorders).

Some amount of elastic subsidence occurs annually in response to seasonal pumping and recharge as substantiated by ground surface elevations measured with Interferometric Synthetic Aperture Radar (InSAR)[1]. The District has established an acceptable subsidence rate of no more than 0.01 feet per year on average, which has been endorsed by the Water Retailer Groundwater Subcommittee. Monitoring data indicates that this target has generally been met.

In 1991, the District evaluated the remaining land subsidence potential in order establish water level thresholds to avoid additional permanent subsidence due to groundwater overdraft[2]. Ten index wells throughout the Santa Clara Subbasin were selected as control points for subsidence calibration and prediction and the tolerable rate of 0.01 feet per year of inelastic subsidence was applied to determine threshold groundwater levels for these wells. These subsidence thresholds are the groundwater levels that must be maintained to ensure a low risk of unacceptable land subsidence. The location of the subsidence index wells is shown in Figure 5-3.

Elevation Surveys

Periodic surveys of land elevation have been conducted in Santa Clara County since 1934[3]. The District's current benchmark leveling program consists of annual surveys to determine the elevations of survey benchmarks along the three level circuits below.

- Los Altos Circuit, which runs west-east from Los Altos to Milpitas and has been measured since about 1960, with some modification
- Alum Rock Circuit, which runs west-east line from Los Gatos to Alum Rock Park in east San Jose and has been re-leveled since 1999
- Guadalupe Circuit, a north-south route that connects the Los Altos and Alum Rock Circuits and generally follows the Guadalupe River between north and south San Jose and has been re-leveled since 1989

The location of these three level circuits is shown in Figure 5-3.

Extensometer Monitoring

The USGS installed extensometers in Santa Clara County in 1960 to monitor the magnitude and the change in rate of subsidence as part of a study on subsidence. The extensometers measure vertical ground motion relative to a central, isolated pipe that is set beneath the water bearing units. The USGS terminated the field monitoring in January 1983, at which time monitoring was transferred to the District. Two 1,000 foot deep extensometer sites are currently monitored, one in Sunnyvale near Moffett Field ("Sunny") and the other near downtown San Jose ("Martha"), as shown in Figure 5-3.

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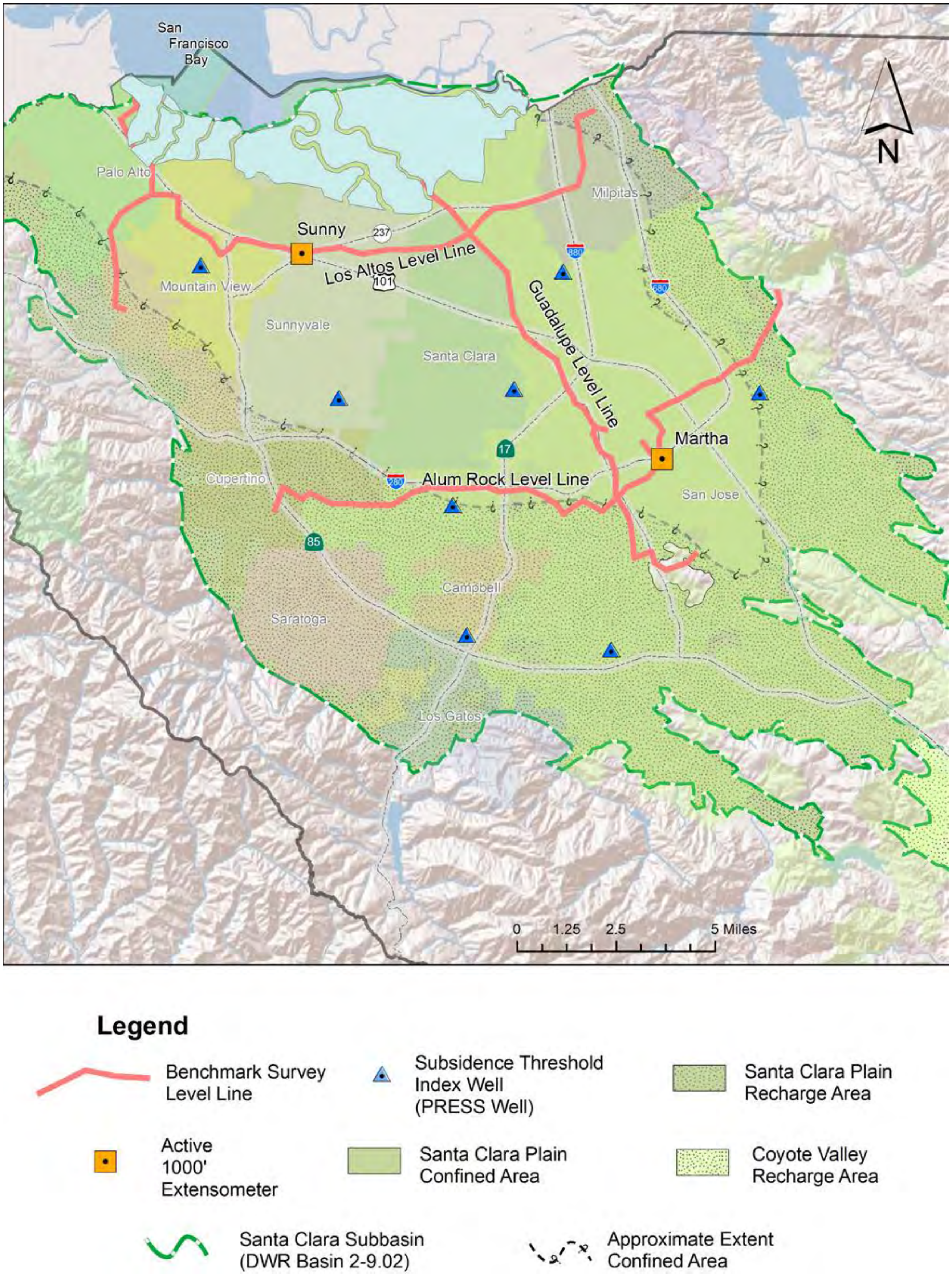
[1] Schmidt, D.A. and Burgmann, R., Time-Dependent Land Uplift and Subsidence in the Santa Clara Valley, California from a Large Interferometric Synthetic Aperture Radar Data Set, Journal of Geophysical Research, Volume 108, No. B9, 2003.

[2] Geoscience Support Services Inc. for Santa Clara Valley Water District, Subsidence Thresholds in the North County Area of Santa Clara Valley, 1991.

[3] USGS, Land Subsidence in the Santa Clara Valley, California as of 1982, Professional Paper 497-F, 1988.

Figure 5-3 Location of Subsidence Index Wells, Level Circuits, and Extensometers



5.3 Groundwater Quality Monitoring

The District conducts groundwater quality monitoring to characterize regional groundwater quality conditions, determine the severity and extent of any contamination, evaluate temporal trends in water quality, and identify any threats to groundwater to determine where further study or action is warranted to protect groundwater resources.

District Annual Groundwater Quality Monitoring

The District's annual groundwater quality monitoring program assesses regional groundwater quality conditions and includes both dedicated monitoring wells and water supply wells owned by the District, local water retailers, and private well owners. Each fall, more than 70 wells are sampled. Samples are analyzed for basic water quality parameters, major ions, total dissolved solids, and nutrients. Volatile and semi-volatile organic compounds (which are infrequently detected) and trace metals (which are commonly detected, but seldom show a significant change) are sampled on a staggered 3 year cycle.

Wells are chosen to provide adequate geographic representation throughout the Santa Clara and Llagas Subbasins while avoiding spatial bias. Monitoring includes both the shallow and principal aquifer zones, although there are currently relatively few shallow zone wells included in the District's monitoring network. The District's annual Groundwater Quality Report is posted on the District website[4] and describes groundwater quality results for wells sampled the previous calendar year. Wells monitored in 2011 are shown in Figures 5-4 and 5-5.

District Focused Groundwater Quality Monitoring

The District also monitors about 50 additional wells at 30 locations on a three-year cycle. These "focus wells" are intended to address specific concerns and allow characterization of water quality in particular zones and areas. Focus wells are monitored every three years and include wells located near San Francisco Bay to monitor salt water intrusion and depth-discrete wells with short screened intervals that allow a vertical profile of groundwater quality to be evaluated. The District has also proposed monitoring focus wells in areas with very high groundwater vulnerability, although none are currently available. The locations of the focus wells are presented in Figure 5-6.

Water Supplier Monitoring

Local water retailers and other public water suppliers in the county perform water quality analysis of well samples in order to comply with CDPH requirements and make operational decisions. In general, compliance monitoring is completed at least once every three years following a schedule set by CDPH. Each year, the District acquires the CDPH database for all public water systems in Santa Clara County and includes that data in the annual evaluation of groundwater quality. In 2011, the District obtained CDPH water quality compliance data from 246 production wells, as shown on Figures 5-4 and 5-5.

Groundwater Ambient Monitoring and Assessment (GAMA) Program

The GAMA program was created by the Groundwater Quality Monitoring Act of 2001 (AB 599), with the goals of improving statewide groundwater monitoring and increasing the availability of groundwater data to the public. The State Water Resources Control Board program is performed by the U.S. Geological Survey and Lawrence Livermore National Laboratory. This program uses special protocol and equipment to obtain very low detection limits, allowing detections at concentrations typically 1 to 3 orders of magnitude below drinking water standards.

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[4] www.valleywater.org

The Santa Clara Subbasin was first sampled for the GAMA program in 2001 and 2002 (under the precursor California Aquifer Susceptibility program[5]) and was re-sampled in the summer of 2007[6]. The Llagas Subbasin was also first sampled in 2001 and 2002 and was sampled again in 2008[7].

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[5] Lawrence Livermore National Laboratory, California Aquifer Susceptibility, A Contamination Vulnerability Assessment for the Santa Clara and San Mateo County Groundwater Basins, 2004.

[6] USGS, Ground-water quality data in the San Francisco Bay study unit, 2007: Results from the California GAMA program: U.S. Geological Survey Data Series 396, 2009.

[7] USGS, Groundwater-quality data in the South Coast Interior Basins study unit, 2008: Results from the California GAMA program: U.S. Geological Survey Data Series 463, 2009.

Figure 5-4 2011 Groundwater Quality Monitoring – Santa Clara Subbasin

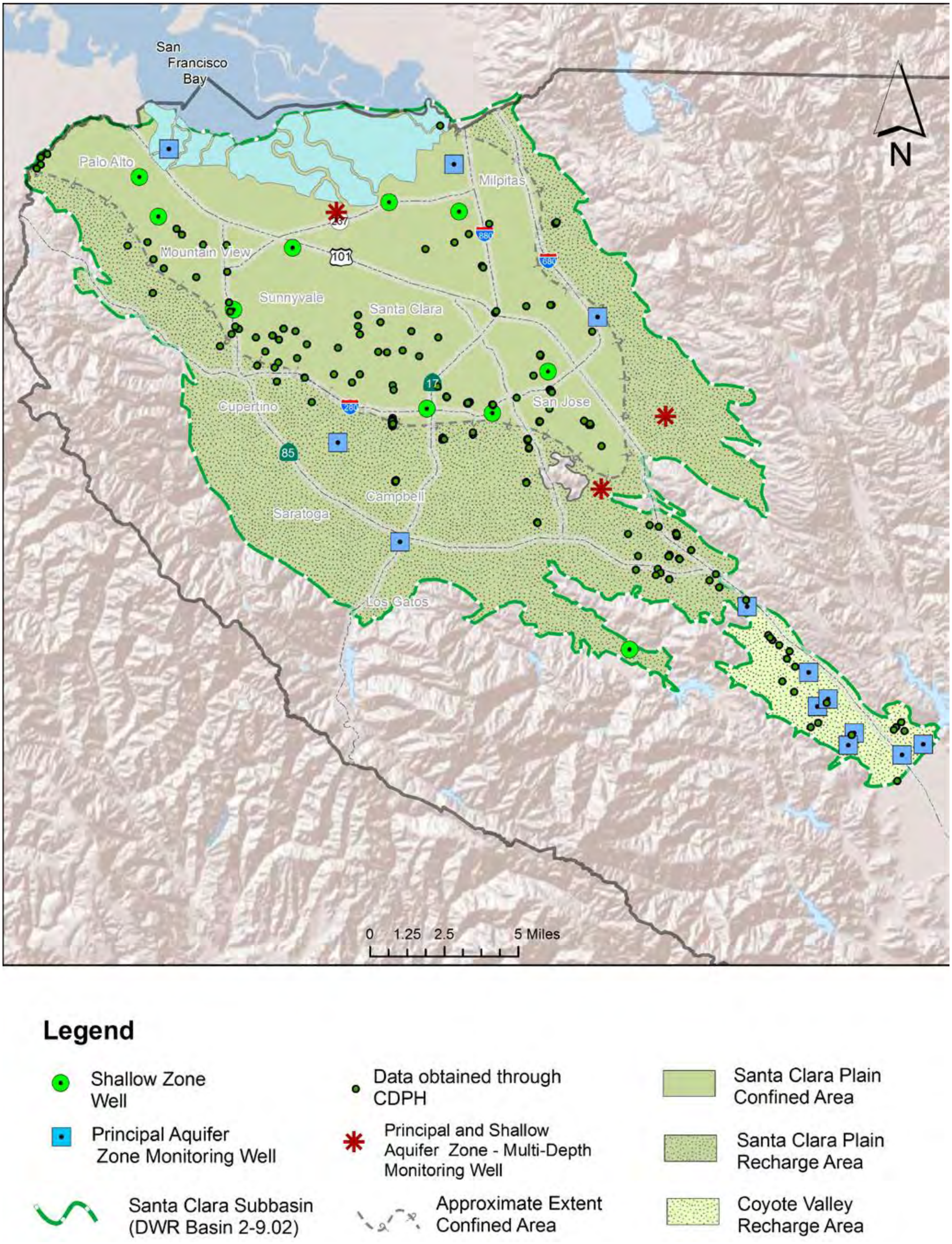


Figure 5-5 2011 Groundwater Quality Monitoring – Llagas Subbasin

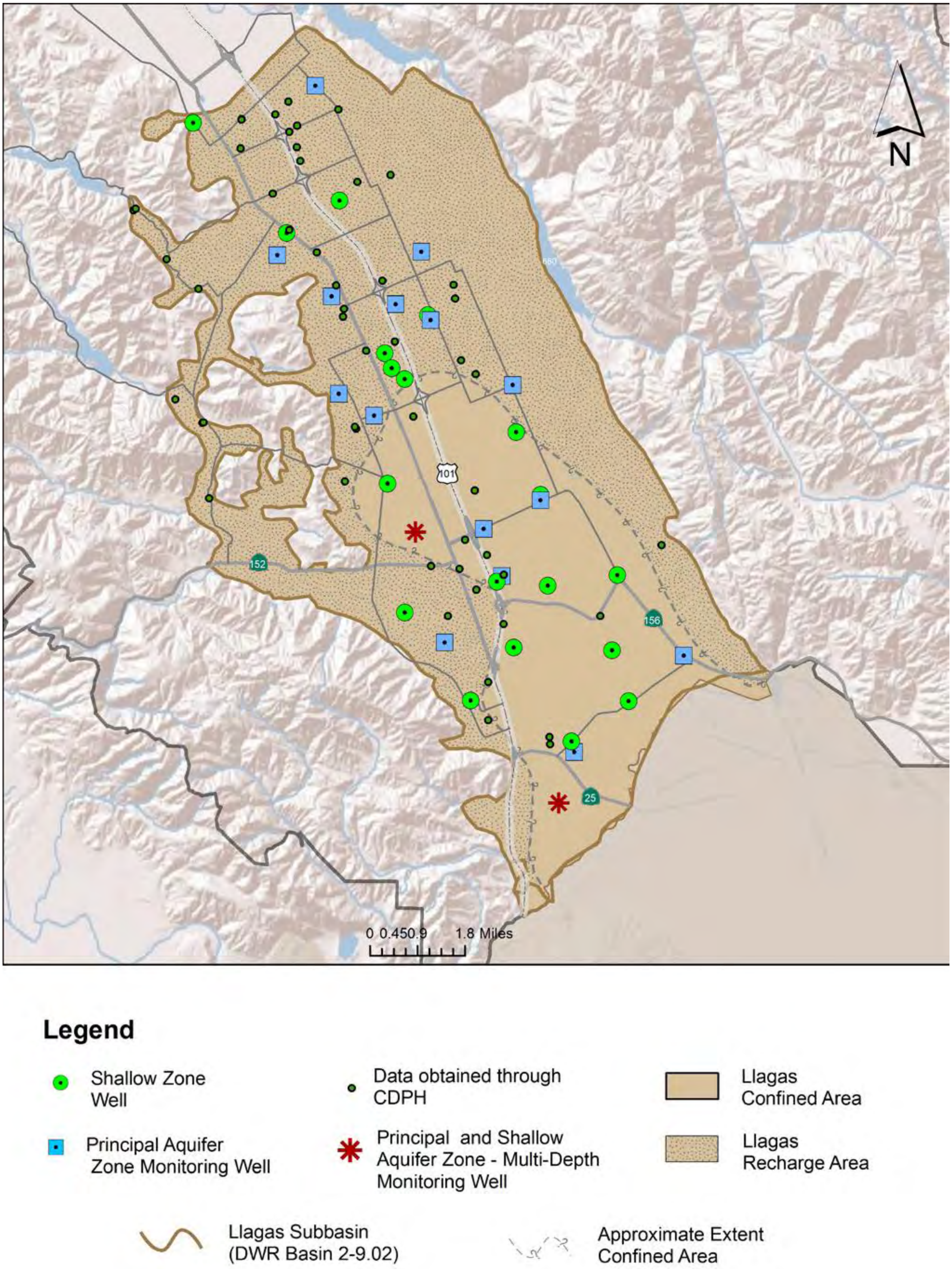
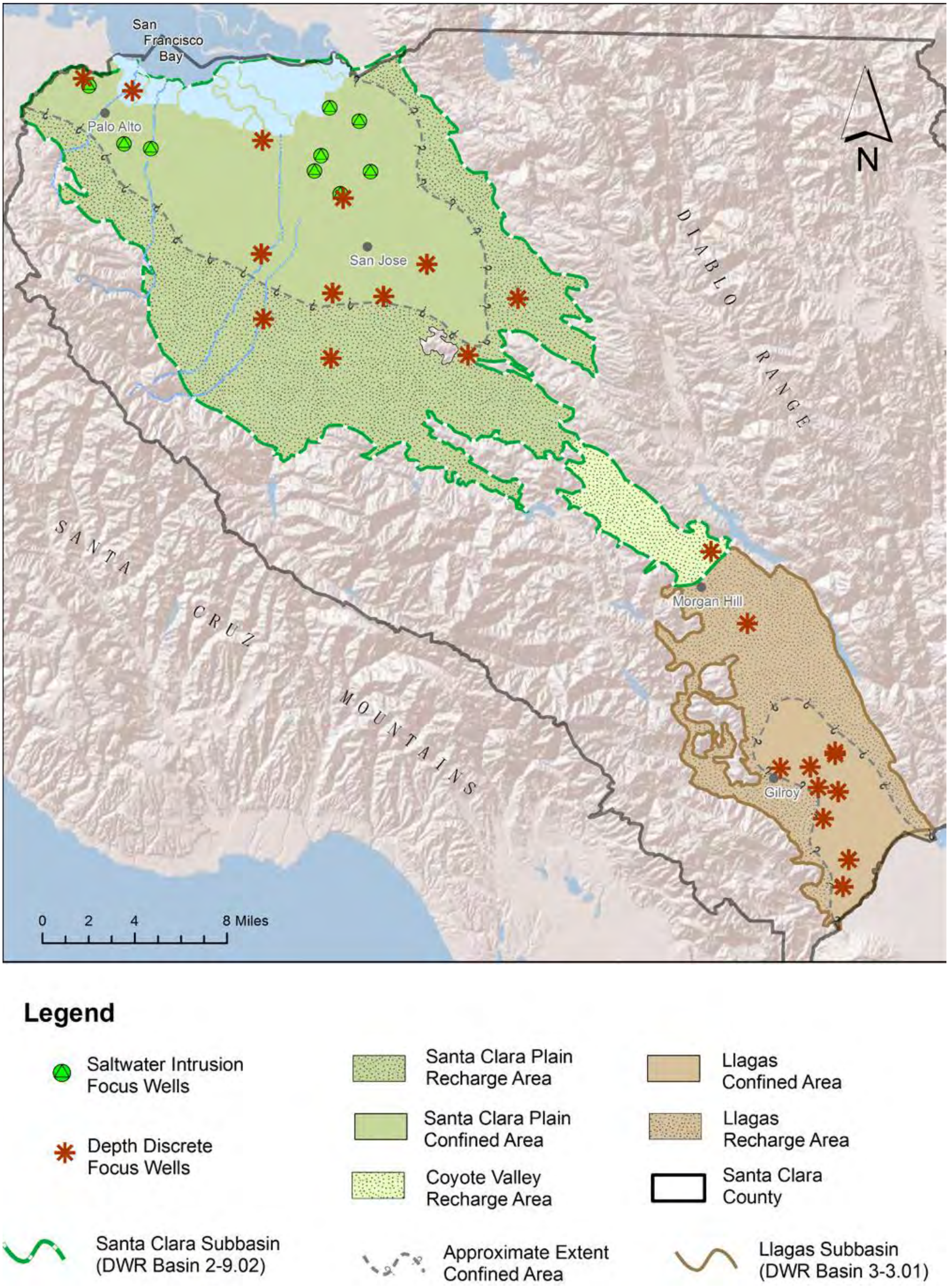


Figure 5-6 Location of Groundwater Quality Monitoring Focus Wells



5.4 Surface Water Monitoring

Recharge Water Quality Monitoring

The District monitors water quality for water supply sources that feed the District's water treatment plants, specifically those reservoirs designated as drinking water resources and imported raw water from the Sacramento/San Joaquin Delta. This monitoring effectively covers most, but not all, of the water used in the managed groundwater recharge program. The District has recently begun to monitor the water quality at District facilities used to recharge groundwater, such as ponds and creeks. These facilities may receive a blend of local runoff and imported water, and may be susceptible to contamination from nearby land use activities such as roads and highways.

The purpose of the District's recharge water quality monitoring program is to characterize the quality of water used for managed recharge at District facilities, to identify constituents of concern that may impact groundwater quality, and to determine whether changes to existing groundwater water quality monitoring programs or recharge operations are necessary to protect groundwater.

Monitoring is performed during both the wet season and dry season at recharge ponds and creeks used by the District for managed recharge. In order to sample each recharge system, the sampling frequency consists of a rotating schedule designed to sample each major recharge system at least once every three years. Constituents analyzed included major and minor ions, trace elements, total dissolved solids, electrical conductivity, and alkalinity. Additionally, samples from selected recharge facilities are tested for semi-volatile and volatile organic compounds during the wet season based on the proximity and types of potentially contaminating land use activities. The recharge facilities sampled and parameters analyzed each year are described in the District's annual Recharge Water Quality Monitoring Report, which is posted on the District's website[8].

Between 9 and 16 recharge facilities were sampled on multiple occasions in fiscal years 2010, 2011, and 2012 as shown in Figure 5-7.

Surface Water Flow Monitoring

Surface water stage and flow rates are measured to ensure that recharge facilities are receiving the appropriate flows, to comply with water rights reporting and reservoir restrictions, and to meet environmental requirements. Surface water flow data also helps the District evaluate which reaches of streams are gaining streams or losing streams with regard to groundwater interaction as described in Section 4.3.4 (Water Accounting). Stream gauging stations monitored by the District are presented in Figure 5-8.

Stream gauging data is available on the District's website[8] in real-time through the ALERT system (Automated Local Evaluation in Real Time) using radio telemetry.

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[8] www.valleywater.org

Figure 5-7 Recharge Water Quality Monitoring Locations

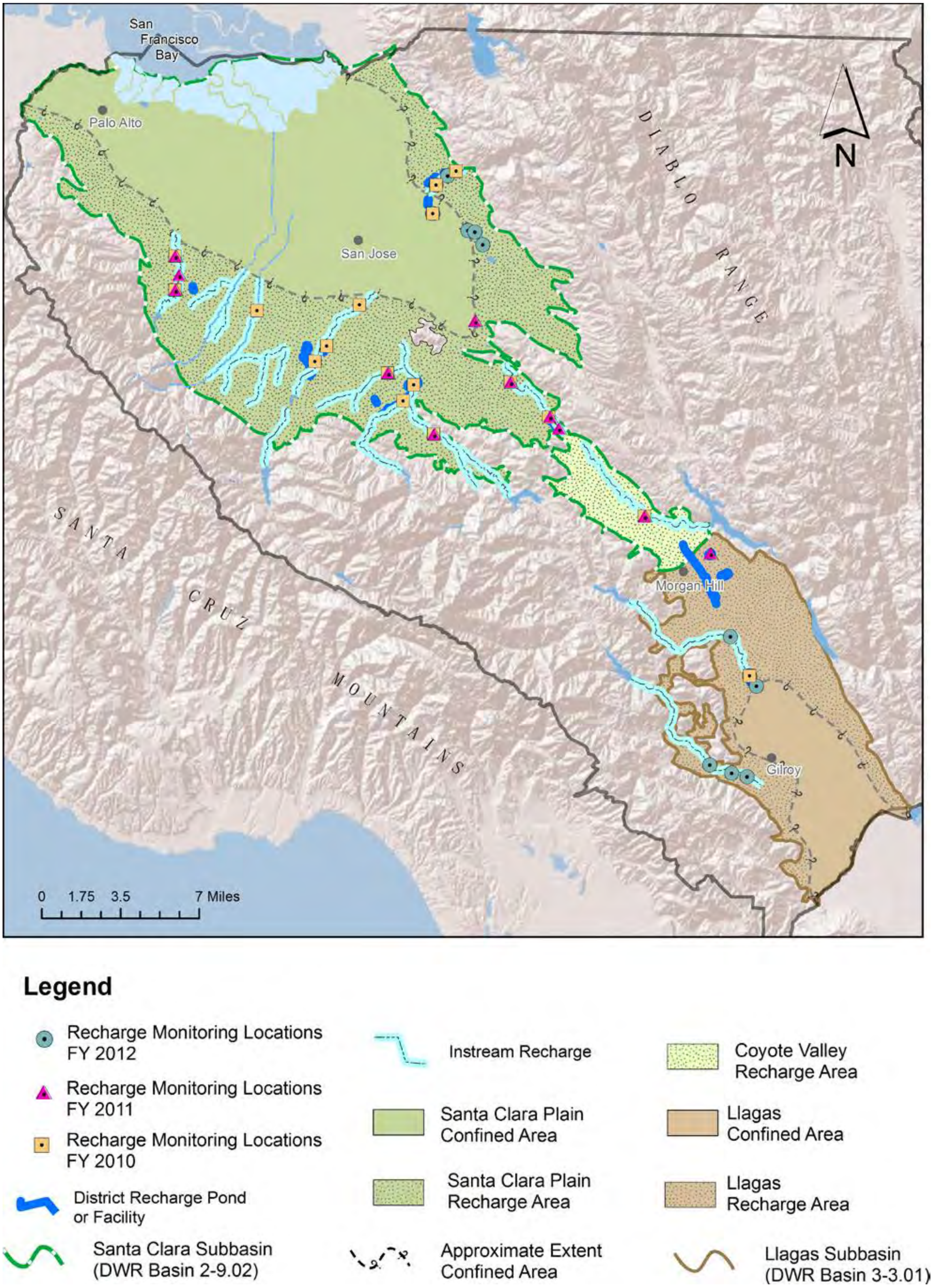
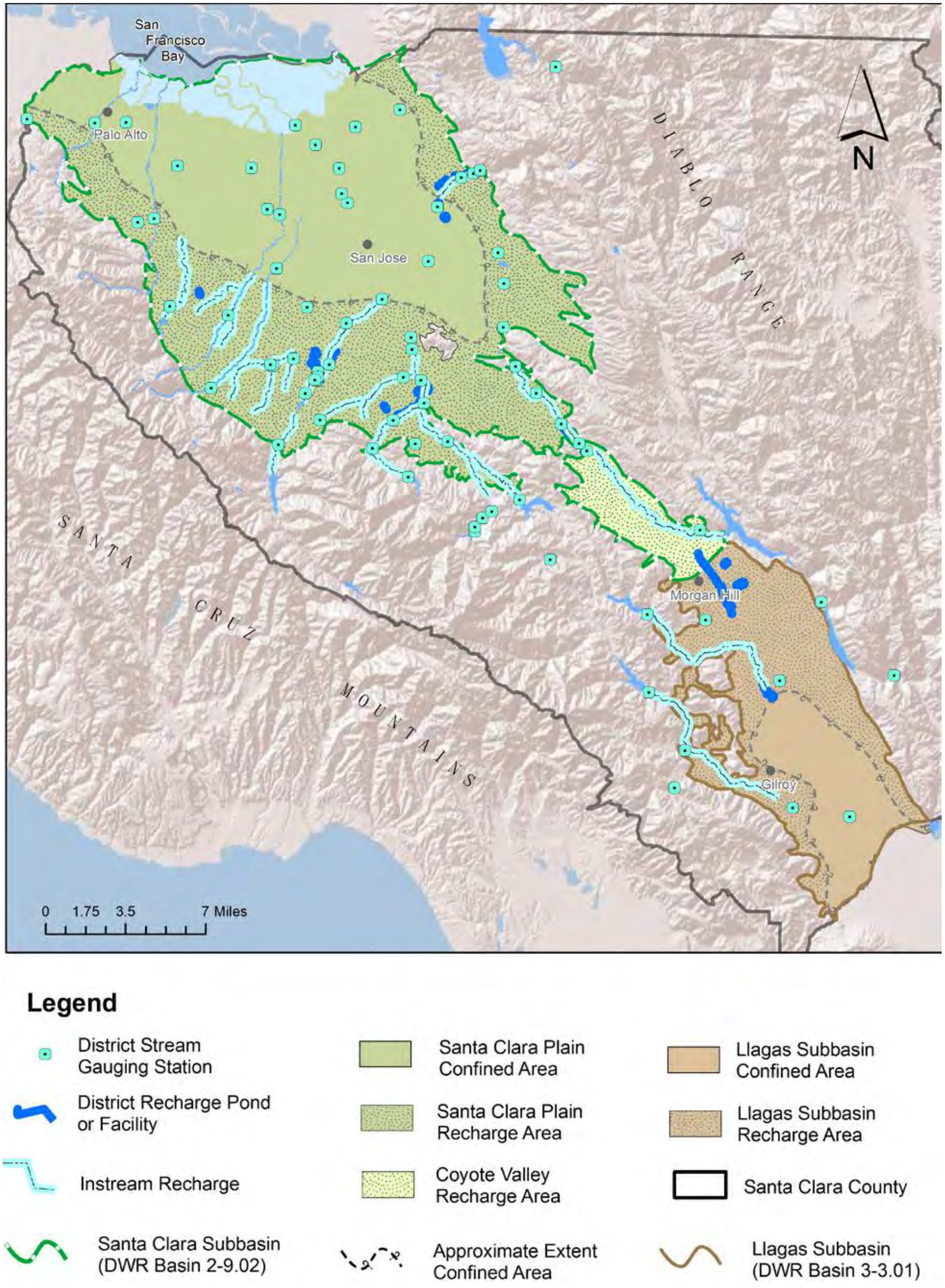


Figure 5-8 Location of Stream Gauging Stations



5.5 Collection, Management, and Reporting of Monitoring Data

As described above, the District collects a significant amount of data each year related to groundwater levels, land subsidence, groundwater quality, and recharge water quality. Data collected through various monitoring programs are stored in the District's databases to allow for subsequent retrieval and data analysis. The District's monitoring protocols described in this section help ensure data is properly measured, analyzed, and recorded.

Monitoring Protocols

The District is certified under the International Standards for Organizations (ISO) 9000 and 14000 series. As part of the compliance with these standards, the District has developed a Quality Environmental Management System (QEMS). The monitoring programs described above have written protocols that have been established or are in the process of being established to ensure that the data is of high quality and able to meet the District's needs. The District follows standard industry practices and methodology as described briefly below.

The District collects groundwater level data, as well as reservoir and stream gauging data, in accordance with standard practices developed by the USGS. Site conditions, field measurements, and other relevant observations are recorded at the time of monitoring. Elevation surveys are performed in accordance with standard practices developed by the U.S. Army Corp of Engineers.

The District collects water quality samples from wells and recharge facilities in accordance with standard practices developed by the USGS. Site conditions, field measurements, and other relevant observations are recorded in field notebooks or field computers and standard chain-of-custody procedures are followed. Samples are handled and stored in accordance with the analytical method requirements and are delivered to state-certified laboratories for analysis. The District's laboratory, which is certified under the California Department of Public Health's Environmental Laboratory Accreditation Program, is used for sample analysis whenever possible.

Reporting of Monitoring Data

Monitoring data provides the basis for numerous District programs, projects, and management decisions, including annual water supply operations and long-term water utility planning. Data collected by the District is made publicly available on the District website[9] through a number of regular publications as shown in Table 5-1 below.

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[9] www.valleywater.org

Table 5-1 Availability of District Monitoring Data

Report	Frequency of Publication	Contents
Protection and Augmentation of Water Supplies Report	Annual (February)	Information on water supply and use; groundwater recharge, pumping, levels, and storage; in-lieu recharge, projected water supply availability and demand, and activities to protect and augment water supplies as required by the District Act
Water Tracker	Monthly	Current data for groundwater levels at select wells, pumping, recharge, and estimated groundwater storage
Groundwater Quality Report	Annual (June)	Groundwater quality data for the Santa Clara and Llagas Subbasins, including comparison to water quality objectives and evaluation of trend
Recharge Water Quality Report	Annual (June)	Recharge water quality data for facilities monitored

In addition to the reports listed, the District website also has real-time data for stream flow gauges, rain gauges, reservoir gauges, and a weather station. As the designated monitoring entity for Santa Clara County under the CASGEM program, water level data collected by the District is also reported to DWR and posted on the CASGEM website.

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6 2012 GROUNDWATER MANAGEMENT PLAN

Outcome Measures

This chapter describes key performance measures in meeting the following basin management objectives: (1) Groundwater supplies are managed to optimize water supply reliability and minimize land subsidence; and (2) Groundwater is protected from existing and potential contamination, including salt water intrusion. These outcome measures, which are described in detail in this chapter, are as follows:

1. Projected end of year groundwater storage is greater than 278,000 AF in the Santa Clara Plain, 5,000 AF in Coyote Valley, and 17,000 AF in the Llagas Subbasin.
2. Groundwater levels are above subsidence thresholds at the subsidence index wells.
3. At least 95% of countywide water supply wells meet primary drinking water standards and at least 90% of South County wells meet Basin Plan agricultural objectives.
4. At least 90% of wells in both the shallow and principal aquifer zones have stable or decreasing concentrations of nitrate, chloride, and total dissolved solids (TDS).

These measures will be assessed annually, based on data for the previous year. The basis for these outcome measures and a description of how they will be measured is presented below.

6.1 GROUNDWATER STORAGE

Outcome Measure: Projected end of year groundwater storage is greater than 278,000 AF in the Santa Clara Plain, 5,000 AF in Coyote Valley, and 17,000 AF in the Llagas Subbasin.

Groundwater storage is a critical consideration in water supply reliability and is the county's best protection against drought or other facility outage. The end of year groundwater storage is projected to support operational decisions, including the timing and location of reservoir releases and managed recharge, and decisions related to imported water such as short-term water exchanges or out of county banking.

The District's Urban Water Management Plan[1] contains a water shortage contingency plan that uses groundwater storage to indicate potential water shortages and outlines the overall strategy for dealing with water shortages, including contingency actions. The "normal" stage where no contingency action is needed occurs when projected end of year groundwater storage is above 300,000 AF.

While the UWMP provides an overall storage target of 300,000 AF, more specificity is needed with regard to the management of individual subbasins and groundwater management areas. Based on groundwater storage observed historically, the end of year storage targets established in this 2012 GWMP are 278,000 AF for the Santa Clara Plain, 5,000 AF for the Coyote Valley, and 17,000 AF for the Llagas Subbasin.

6.2 GROUNDWATER LEVELS AND LAND SUBSIDENCE

Outcome Measure: Groundwater levels are above subsidence thresholds at the subsidence index wells.

Inelastic land subsidence in the Santa Clara Plain began in the early twentieth century, due mainly to a reduction of artesian pressure from excessive groundwater pumping. Lands near the Bay sank below sea level, resulting in salt water intrusion and requiring investments in additional flood control facilities. Significant inelastic subsidence (up to 13 feet in San Jose) was essentially halted by about 1970 through the District's expanded conjunctive use programs, which allowed a substantial recovery in groundwater levels. The avoidance of inelastic land subsidence

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[1] Santa Clara Valley Water District, Urban Water Management Plan, 2010.

has been and continues to be a major driver for the District given the extremely high costs associated with damaged infrastructure, reduced carrying capacity of flood control structures, and salt water encroachment into fresh water aquifers.

In 1991, the District evaluated the remaining land subsidence potential so as to avoid additional inelastic subsidence due to groundwater overdraft[2]. Ten index wells throughout the Santa Clara Subbasin were selected as control points for subsidence calibration and prediction and the tolerable rate of 0.01 feet per year of inelastic subsidence was applied to determine threshold groundwater levels for these wells. These subsidence thresholds are the groundwater levels that must be maintained to ensure a low risk of unacceptable land subsidence.

Based on the findings of this study, the District has established an acceptable subsidence rate of no more than 0.01 feet per year on average. This rate was presented to and endorsed by the Water Retailer Groundwater Subcommittee following the study, and the related subsidence thresholds have been used historically to measure performance in meeting Board policy. Monitoring data indicates that target has generally been met.

This outcome measure relies on continued observation of groundwater levels at the subsidence index wells and comparison to subsidence thresholds to ensure groundwater levels are maintained above these thresholds. Since inelastic subsidence is irreversible, it is critical that it is prevented rather than observed. Therefore, to be proactive, the District also performs scenario modeling to project future groundwater conditions so changes in operations or groundwater management can be made to avoid inelastic subsidence before it occurs.

6.3 GROUNDWATER QUALITY

Outcome Measure: At least 95% of countywide water supply wells meet primary drinking water standards and at least 90% of South County wells meet Basin Plan agricultural objectives.

Water supply reliability depends on maintaining both an adequate supply of water and protecting water quality. While surface water goes through significant treatment before being served as drinking water, groundwater in the county typically does not require wellhead treatment before being served. This makes protecting groundwater quality all the more critical. The groundwater subbasins in Santa Clara County have good water quality overall, but maintaining that quality is not without its challenges. Threats to groundwater quality come from a variety of sources and include urban, rural, and agricultural activities. Elevated nitrate is fairly widespread South County and each year, a few detections above maximum contaminant levels are also noted for constituents such as perchlorate and aluminum.

To protect the quality of groundwater for beneficial uses, this outcome measure evaluates the percentage of water supply wells that meet all primary Maximum Contaminant Levels (MCLs) and South County wells meeting agricultural objectives for irrigation. Since the focus of this outcome measure is on groundwater currently used and most of the groundwater extracted is from deeper aquifers, data from water supply wells in the principal aquifer zone are used for this measure. This outcome measure will be evaluated annually using data collected at water supply wells by the District and water retailers. Data from dedicated monitoring wells will not be used as it is less representative of water being pumped for beneficial use.

The target percentage for water supply wells meeting primary MCLs is set high (95%) since these are health-based regulatory standards that must be met by public water systems. This measure is not set at 100% for several reasons. CDPH does not consider a single detection of a contaminant to be indicative of contamination and would not consider a single detection to be an actual finding without a follow-up detection. Water served to customers may not have had the contaminant present at that concentration since water systems may perform treatment or blending

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[2] Geoscience Support Services Inc. for Santa Clara Valley Water District, Subsidence Thresholds in the North County Area of Santa Clara Valley, 1991.

prior to service. Also, some of the wells monitored by the District are private domestic wells, which are assumed to have less stringent wellhead protection, maintenance, and testing. The water quality at these wells may be more influenced by local land use and conditions near the well as they are typically shallower than public water supply wells and domestic wells are not subject to drinking water standards.

The target percentage for South County water supply wells meeting Basin Plan agricultural objectives for irrigation is set at 90%. The lower target for the agricultural outcome measure reflects the less serious consequences; not meeting this target does not adversely impact human health but may reduce plant yield. Ideally, the measurement would rely on agricultural wells, however the District has monitoring access to very few of these wells. Agricultural wells are assumed to have similar construction as water supply wells (multiple screened intervals) so water supply wells are used as a proxy. This measure is only applicable to water supply wells in the Coyote Valley and Llagas Subbasin since there is very little remaining agriculture in the Santa Clara Plain. Water quality data will be compared to agricultural objectives for irrigation per the San Francisco Bay Basin Plan for the Coyote Valley and the Central Coast Basin Plan for the Llagas Subbasin.

6.4 GROUNDWATER QUALITY TRENDS

Outcome Measure: At least 90% of wells in both the shallow and principal zones have stable or decreasing concentrations of nitrate, chloride, and total dissolved solids (TDS).

The timely identification of adverse trends is important so that appropriate action can be taken to protect groundwater resources. This outcome measure will evaluate long-term trends in groundwater quality for nitrate, chloride, and TDS on an annual basis using ten years of data from both water supply and dedicated monitoring wells. This will help the District to better understand how groundwater quality is changing over time and highlight areas that may warrant further study or action to protect the beneficial use of groundwater.

Nitrate trends will be evaluated because nitrate affects the largest number of wells in the county. Common sources of nitrate in groundwater are synthetic fertilizers, septic systems, and animal wastes. Elevated nitrate is common in the Llagas Subbasin due to historic and ongoing sources; however there are also localized areas with nitrate concerns in the Santa Clara Subbasin. Chloride is used to measure potentially adverse trends related to salt water intrusion, which has occurred historically adjacent to San Francisco Bay. Evaluating long-term trends will help assess the potential for renewed intrusion. TDS is used as an indicator of salt loading and of overall water quality. The salts from applied water remain in the soil layer, and can eventually be leached into groundwater by rainfall or over-irrigation.

This outcome measure tracks the trend in nitrate, chloride, and TDS concentrations to evaluate potentially adverse conditions. The measure evaluates shallow and principal aquifer zone wells separately since changes in shallow wells might be detectable before changes appear in deeper wells. Trends will be analyzed for all available wells, including both water supply and dedicated monitoring wells. The outcome measure uses a target percentage of 90% to serve as a broad indicator of trends in these constituents, while recognizing that groundwater quality can fluctuate at any given well over time due to hydrology, pumping, or other factors. Also, the mere presence of a statistically significant increasing trend does not necessarily indicate a problem; the magnitude of change also needs to be considered. While the target percentage of 90% will serve as an overall indicator of trends in groundwater quality, the magnitude of trend will also be evaluated to identify potential areas of concern so that additional action can be taken if necessary to protect groundwater resources.

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7

2012 GROUNDWATER MANAGEMENT PLAN

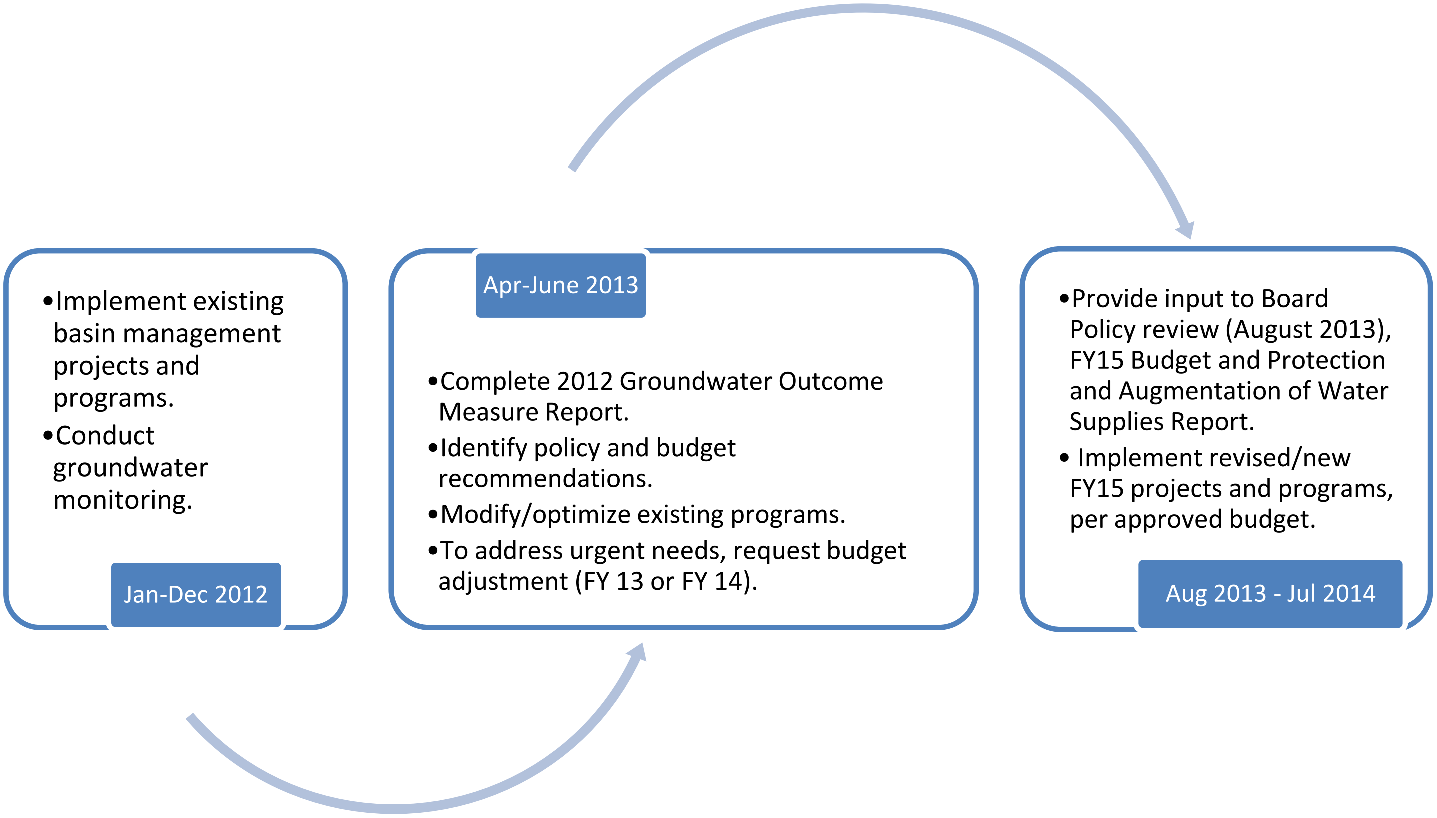
Next Steps

Previous chapters of this 2012 Groundwater Management Plan outlined the District's basin management objectives, strategies to meet those objectives, related programs and activities, and key outcome measures to gauge performance. This chapter describes potential actions that may be taken if an outcome measure is not met. This chapter also presents specific report recommendations.

7.1 EVALUATION AND REPORTING OF OUTCOME MEASURES

The outcome measures presented in the 2012 Groundwater Management Plan will be evaluated on a regular basis for the previous operational year as described in Chapter 6. The results of this evaluation will be presented in an annual Groundwater Outcome Measure Report, which will also include recommendations for action if any outcome measure indicates improvement is needed. Recommended actions may include changes to existing programs that can be implemented immediately, as well as new initiatives that may be included in future budget proposals. As an example, the evaluation and reporting cycle for 2012 groundwater management is shown in Figure 7-1 below.

Figure 7-1 Reporting Cycle for 2012 Groundwater Management



Jan-Dec 2012

- Implement existing basin management projects and programs.
- Conduct groundwater monitoring.

Apr-June 2013

- Complete 2012 Groundwater Outcome Measure Report.
- Identify policy and budget recommendations.
- Modify/optimize existing programs.
- To address urgent needs, request budget adjustment (FY 13 or FY 14).

Aug 2013 - Jul 2014

- Provide input to Board Policy review (August 2013), FY15 Budget and Protection and Augmentation of Water Supplies Report.
- Implement revised/new FY15 projects and programs, per approved budget.

The 2012 Groundwater Management Plan is based on a "Plan, Do, Check, Act" framework or model of continuous improvement:

- Identify basin management objectives and strategies in accordance with the District Act and Board policy. ("Plan")

- Implement basin management programs and activities in accordance with strategies to achieve basin management objectives. (“Do”)
- Conduct monitoring, analyze results, and compare to outcome measures. (“Check”)
- Modify existing programs or evaluate and develop new strategies and tools if outcome measures indicate improvement is needed. (“Act”)

The District plans to review the Groundwater Management Plan (GWMP) and update as needed every five years. This schedule will ensure that current information on local groundwater management is available to support the five-year updates of Urban Water Management Plans (UWMPs) required by State law. As the next UWMP is scheduled to be completed in 2015, the next review and update of this 2012 GWMP will be completed in 2014.

7.2 ADDRESSING OUTCOME PERFORMANCE ISSUES

The District’s approach to groundwater management has evolved over decades in response to numerous challenges, relying upon authorities contained in the District Act, the cooperation of retail water agencies, and the support of local groundwater users as well as a broad array of stakeholders. If evaluation of the outcome measures indicates poor performance toward meeting a basin management objective, the District will first evaluate potential changes to existing programs and activities prior to considering significant groundwater management changes. Any significant policy or investment decisions would be developed and evaluated in coordination with other District planning efforts and in consultation with local stakeholders, as the District does in current planning and budgeting processes.

Water Supply Reliability and Minimization of Land Subsidence

Future challenges to maintaining reliable groundwater supplies and minimizing land subsidence are analyzed in the District’s 2010 Urban Water Management Plan. Strategies to address these challenges are currently being developed in the Water Supply and Infrastructure Master Plan that is anticipated to be complete in 2012. Although county-wide water supplies are generally sufficient to meet demands in normal years through 2030, shortages may occur during future extended droughts (up to 47,000 acre-feet per year, on average). In addition, these plans acknowledge certain risks that could change this water supply outlook, and further impact the District’s ability to maintain groundwater supplies. These risks include increased water needs beyond current projections, and uncertainties in surface water supplies, including San Francisco Public Utilities Commission contract renewal, constraints on Delta exports, and climate change.

Existing groundwater management tools for ensuring groundwater reliability and minimizing land subsidence include:

- Implementation of additional managed recharge and groundwater pumping offsets through treated water sales and expansion of water use efficiency programs;
- Cooperation with water retailers on source shifts and drought demand reductions;
- Coordination with water retailers and cities on Urban Water Management Plans and water use assessments required under SB610.

Potential groundwater management tools that could also be considered include:

- Creation or modification of groundwater charge zones;
- Changes to the groundwater charge rate structure;
- Changes in the District’s well permitting process;
- Institutional agreements with water retailers related to groundwater management;

- Regulation of groundwater pumping if groundwater is endangered and regulation is necessary to avoid permanent damage in the form of diminution, contamination, pollution, or soil compaction in accordance with the District Act

Groundwater Quality Protection

Challenges to protecting groundwater quality include intensified land use, emerging contaminants, and responding to changing regulatory standards. The District works in cooperation with water retailers, land use agencies, regulatory agencies, and the public to protect groundwater resources. If the performance measures for groundwater quality are not met, there are a number of additional activities that can be considered to improve groundwater protection, depending on the nature of the observed contamination or the identified threat, including:

- Increased coordination with regulatory agencies to ensure that high-threat contamination is promptly and adequately addressed
- Expanded outreach efforts to raise awareness of groundwater protection, including outreach to agricultural users in coordination with local partners and the Central Coast Water Board
- Coordination with local land use agencies and others to develop guidelines or best management practices related to specific threats
- Expanded efforts with legislators and others to target significant threats and fund regulatory efforts
- Enhanced recharge programs to further dilute contaminants
- Providing point-of-use or wellhead treatment of pumped groundwater to reduce exposure to nitrate
- Re-initiation of the District’s abandoned well destruction assistance program to address vertical conduit threats
- New groundwater protection ordinance or regulatory solutions, if needed to protect groundwater quality

7.3 RECOMMENDATIONS

The District’s proactive groundwater management programs and activities have maintained groundwater levels, minimized land subsidence, and improved groundwater protection. To maintain the long-term viability of groundwater resources, the following specific actions are recommended:

1. **Maintain existing conjunctive use programs and evaluate opportunities for enhancement or increased efficiency.**

   Conjunctive use programs maintain groundwater levels and flow gradients and are essential to prevent groundwater overdraft, land subsidence, and salt water intrusion. Priorities include efforts to:

   a. Ensure the reliability of and maintain the District’s existing water utility infrastructure, including local dams and reservoirs, diversion structures, pipelines, pumping stations, treatment plants and managed recharge facilities.

   b. Implement high-priority capital projects that support conjunctive use, including seismic stability projects to improve dam safety and restore full reservoir storage capacity.

   c. Secure local and imported sources of supply, including a long-term solution for reliable Delta conveyance.

   d. Continue and expand where possible in-lieu recharge programs to offset pumping, including treated water sales, water recycling and water conservation, to reduce demands on the groundwater subbasins.

   e. Encourage water retailers to maintain other water supply sources, including San Francisco Public Utilities Commission contract deliveries to Santa Clara County.

   f. Maintain and optimize operations activities that support the conjunctive use program, including modeling, forecasting, systems control, and water accounting.

2. **Continue to aggressively protect groundwater quality through District programs and collaboration with land use agencies, regulatory agencies, and basin stakeholders.**

   A reliable water supply depends not only on quantity, but on quality. Unlike surface water, most groundwater pumped in the county does not require treatment prior to drinking or beneficial use, making protection of this local resource all the more important. Priorities include efforts to:

   a. Continue to implement comprehensive programs to evaluate groundwater quality conditions so potentially adverse trends can be quickly identified and appropriate action can be taken before conditions become severe.

   b. Collaborate with local partners and regulatory agencies on efforts including salt and nutrient management, storm water management, land use and policy review, and recycled water expansion.

   c. Evaluate opportunities for expanded partnerships to maximize groundwater protection.

3. **Finalize key Water Utility plans.**

   a. Complete the Water Supply and Infrastructure Master Plan by December 2012 to address future challenges to maintaining reliable groundwater supplies and minimizing land subsidence.

   b. Complete the Salt and Nutrient Management Plan by December 2013 to address changes in land use, expansion of recycled water, and other water quality management issues.

4. **Maintain adequate monitoring programs.**

   The assessment of groundwater conditions and performance of outcome measures relies on timely, accurate, and representative data. The District has established comprehensive monitoring programs and related protocols for measurement of groundwater levels, land subsidence, groundwater quality, recharge water quality, and surface water flow. However, many of these programs have spatial data gaps due to the lack of appropriate wells, well destruction, loss of access to private wells, and other issues. Priorities include efforts to:

   a. Validate existing monitoring networks and identify gaps.

   b. Secure long-term access for sustainable monitoring networks.

   c. Prepare justifications for construction of additional monitoring wells as needed.

5. **Continue and enhance groundwater management partnerships with water retailers and land use agencies.**

   a. Continue regular Water Retailer meetings, including the Groundwater Subcommittee.

   b. Meet regularly with South County water retailers to discuss Llagas Subbasin management issues.

c. Explore options for improved management of local water and San Francisco Public Utilities Commission supplies in Santa Clara County.

d. Further develop contingency plans and management options for water shortages, as well as for local or Delta-related interruptions in supply.

e. Coordinate with water retailers and local land use agencies on water supply assessments and the development of 2015 Urban Water Management Plans.

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APPENDIX A – GROUNDWATER MANAGEMENT HISTORY

History of the County's Groundwater[1]

Water has played an important part in the development of Santa Clara County since the arrival of the Spaniards in 1776. Unlike the indigenous peoples, who for thousands of years depended upon the availability of wild food, the Spaniards cultivated food crops and irrigated with surface water. Population growth and the United States' conquest of the area in 1846 increased agricultural demands, which forced the use of the groundwater basin. The first well in the county was drilled in 1854 in San Jose. Groundwater was drawn to the surface by windmill pumps or flowed up under artesian conditions.

By 1865, there were close to 500 artesian wells in the valley and already signs of potential misuse of groundwater supplies. In the valley's newspapers a series of editorials and letters appeared which complained of farmers and others who left their wells uncapped, and blamed them for water shortages and erosion damage to the lowlands.

As a result of several dry years in the late 1890s, more and more wells were installed. Dry winters in the early 1900s were accompanied by a growing demand for the county's fruits and vegetables, which were irrigated with groundwater. This trend of increased irrigation and well drilling continued until 1915. During this period, less water replenished the groundwater basin than was removed, causing groundwater levels to drop rapidly.

In 1913, a group of farmers asked the federal government for relief from the increased cost of pumping that resulted from a lower groundwater table. The farmers formed an irrigation district to investigate possible reservoir sites; however, the following year was wet and no action was taken. It was not until 1919 that the Farm Owners and Operators Association presented a resolution to the County Board of Supervisors expressing their strong opposition to the waste resulting from the use of artesian wells, and again raised the issue of building dams to supplement existing water supplies. By that year, subsidence of 0.4 feet had occurred in San Jose.

In 1921, a report was presented to the Santa Clara Valley Water Conservation Committee showing that far more water was being pumped from the ground than nature could replace[2]. The committee planned to form a water district that differed from others in the state by having a provision for groundwater recharge. Their effort to form the water district failed, but they were able to implement several water recharge and conservation programs. Continued overdraft of the basin resulted in a further decline in groundwater levels and inelastic land subsidence, thereby increasing flood impacts in the northern part of the County. Between 1912 and 1932, subsidence ranged from 0.35 feet in Palo Alto to 3.66 feet in San Jose. In 1929, county voters approved the Santa Clara Valley Water Conservation District (SCVWCD), with the initial mission of stopping groundwater overdraft and ground surface subsidence.

The SCVWCD was the forerunner of today's Santa Clara Valley Water District (District), which was formed through the consolidation and annexation of other flood control and water districts within Santa Clara County. By 1935, the District had completed the construction of Almaden, Calero, Guadalupe, Stevens Creek, and Vasona dams. Later dams completed include Coyote in 1936, Anderson in 1950, and Lexington in 1952. The Gavilan Water District in

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[1] California History Center & Foundation, Water in the Santa Clara Valley: A History, 2005.

[2] Tibbets F.H. and Kiefer S.E., Santa Clara Valley Water Conservation Project, Report to the Santa Clara Valley Water Conservation Committee, 1921.

the southern portion of the County constructed Chesbro Dam in 1955 and Uvas Dam in 1957. These dams enabled the District to capture surface water runoff and release it for groundwater recharge.

The late 1930s to 1947 marked a period of recovery in groundwater levels that reduced the rate of subsidence. In 1947, conditions became dry, groundwater levels declined rapidly and subsidence resumed. In 1950 almost all of the county's water requirements were met by water pumped from the groundwater, resulting in an all-time low groundwater level in the Santa Clara Plain.

In 1952, the San Francisco Public Utilities Commission began delivering imported water to water retailers in northern Santa Clara County through the Hetch Hetchy southern aqueduct, however some delivery of this supply into the county took place as early as 1939[3]. By 1960, the population of the county had doubled from that of 1950. To supply this growth, groundwater pumping increased and groundwater levels continued to decline. In addition to continued land subsidence, widespread salt water intrusion of shallow aquifers was observed adjacent to San Francisco Bay in the late 1950s[4]. By the early 1960s, it was evident that the combination of Hetch Hetchy and local water supplies could not meet the area's water demands, so the District entered into a contract with the state to receive 100,000 acre-feet (AF) of State Water Project (SWP) water per year through the South Bay Aqueduct (SBA).

With this new source of supply, the District added a new tool to its groundwater management toolbox: treated surface water sales to offset demand that would otherwise be met through groundwater pumping. The District constructed its first water treatment plant (WTP), the Rinconada WTP. In 1967, the District started delivering treated surface water to North County residents, thus reducing the need for pumping in the Santa Clara Plain. This led to a recovery of groundwater levels and reduced the rate of subsidence.

From 1960 to 1970, the county's population nearly doubled yet again, with the semiconductor and computer manufacturing industries contributing over 30 percent of the job growth. The growth and prosperity of the county continued, and jobs grew nearly 40 percent between 1970 and 1980. In 1974, Penitencia (the District's second WTP) started delivering treated water. In response to the 1976-1977 drought, the District began its first programs related to conservation education and outreach.

The county's explosive growth and transformation from a predominantly agricultural economy was not without its problems. In the early 1980s, groundwater contamination was brought to the forefront when large underground tanks storing solvents for computer-related manufacturing processes in south San Jose were discovered to be leaking. In 1981, Fairchild notified the District that "a substantial amount of chemicals were missing from their tanks and that a leak was suspected." Subsequent testing of a nearby public water supply well revealed significant contamination, which resulted in shutdown of the well. The District, the Regional Water Quality Control Board, and the Department of Health Services, worked together to sample water supply wells in the county and search for other leaking tanks, resulting in the identification of additional contaminant release sites.

In the 1980s, District significantly increased its efforts to protect groundwater quality. The District worked with the Santa Clara County Fire Chiefs Association, the City Managers Association, and environmental groups to develop a countywide Hazardous Materials Storage Permit Ordinance. The ordinance, adopted by the Santa Clara County Intergovernmental Council, set tough new standards on hazardous material storage and handling. This first in the nation ordinance served as an example and the state and federal government soon passed similar laws[2]. The District also developed well guidelines for the construction and destruction of wells, the majority of which were being installed for the investigation and clean-up at contaminant release sites. The District's abandoned well program was

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[3] Per personal communication with City of Palo Alto staff, the City of Palo Alto began receiving Hetch Hetchy water in 1939 through a different connection.

[4] Santa Clara Valley Water District, Saltwater Intrusion Investigation, September 1980.

developed to address existing wells that were no longer in use and posed a threat to groundwater resources by acting as vertical conduits that could allow contaminants to migrate directly from shallow to deep aquifers.

In the late 1980s, the District began oversight of petroleum hydrocarbon Leaking Underground Storage Tank (LUST) sites in Santa Clara County. From 1988 through 2004, the District provided oversight for the investigation and clean-up of over 2,500 LUST sites. The District's fuel leak program became nationally known for its proactive and innovative approaches and influenced the direction of the state's UST clean-program. By the time the District transferred the program to the County Department of Environmental Health in July 2004, less than 400 fuel leak cases remained open.

Groundwater pumping accounted for about half of the total water use by the mid-1980s. The rate of inelastic land subsidence was reduced to about 0.01 feet per year compared to 1 foot per year in 1961. To provide a reliable source of supply the District contracted with the federal government for the delivery of 152,500 AF per year of imported water from the Central Valley Project (CVP) through the San Felipe Project. The county's first delivery of CVP water took place in 1987, but it was not until 1989 that the District's Santa Teresa WTP began operating to fully utilize this additional source of imported supply.

The extended drought from 1987 to 1992 led to expanded District conservation programs, including more aggressive outreach campaigns and rebate programs for residents and businesses installing water saving fixtures. In the mid-1990s the District began offering financial and technical assistance to entities interested in expanding the use of recycled water. This included agreements with the cities of San Jose, Santa Clara, and Milpitas (the South Bay Water Recycling Program); Gilroy and Morgan Hill (the South County Regional Wastewater Authority); Sunnyvale; and Palo Alto and Mountain View. This commitment to supplementing local supplies with recycled water was strengthened in 1997 when the District Board established a policy supporting the expanded use of recycled and setting numeric targets for future recycled water use.

Nitrate and Methyl Tertiary Butyl-ether (MTBE) emerged as significant groundwater quality threats in the 1990s. Elevated nitrate from agriculture, septic systems, and animal wastes was identified as early as the 1950s, however the concern became more acute in the early 1990s as an increasing number of wells were impacted. The District developed a comprehensive Nitrate Management Plan, which included public outreach programs to educate the residents on fertilizer use, septic system maintenance, and well location and construction. The District also offered free nitrate testing for South County residents in 1998. Later efforts included programs to reduce nitrate loading in cooperation with farmers, including programs to evaluate infield nutrient use.

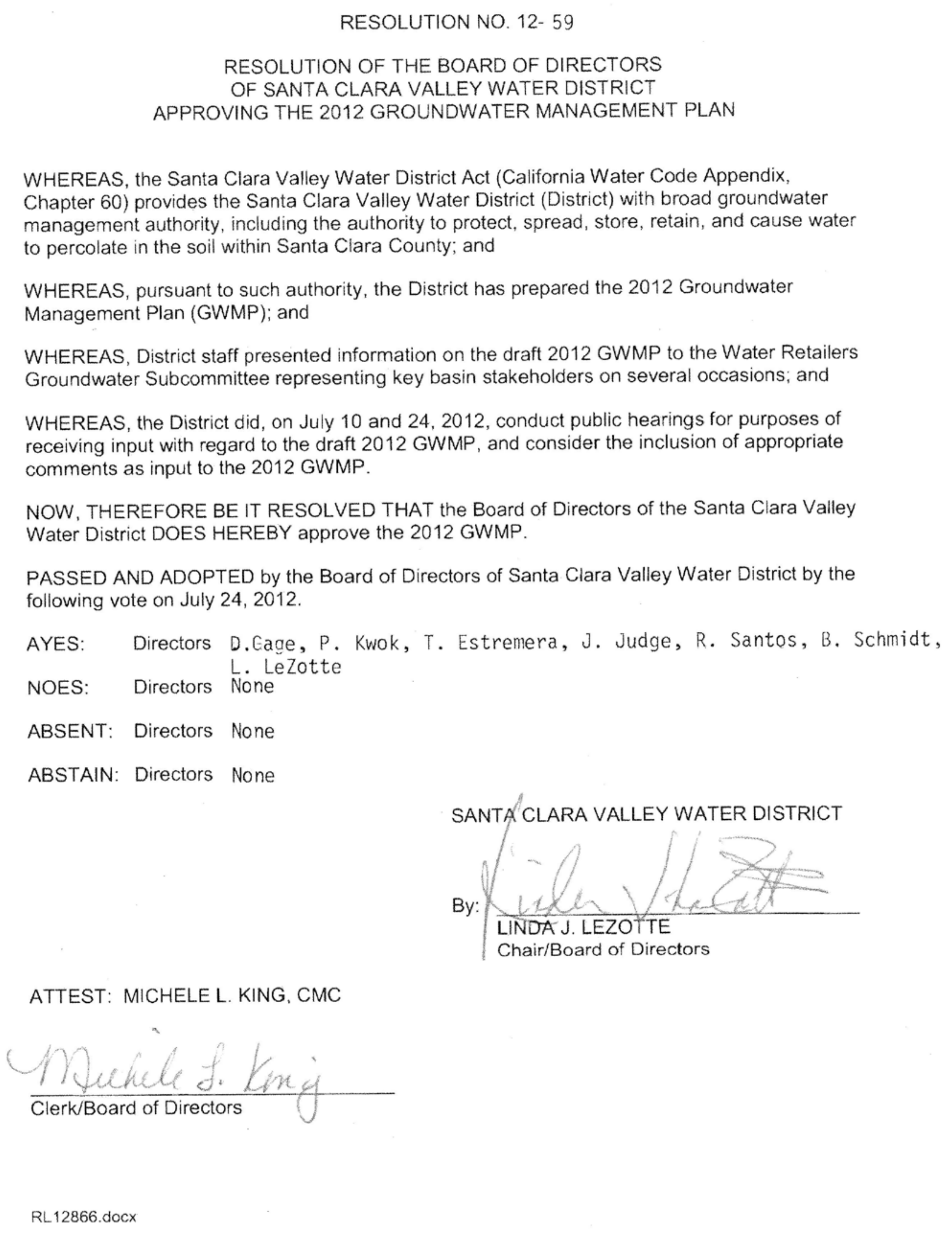
In 1992, California began using oxygenates, primarily MTBE, in gasoline to satisfy federal clean air requirements, The District began investigating the potential for MTBE contamination in 1995, which led to the discovery of MTBE contamination in soil at 292 sites, primarily service stations, and at low concentrations in the District's reservoirs. The District provided the first guidelines in the state for owners of LUST sites on how to identify and clean-up MTBE releases in 1997. Along with many others, the District's action and leadership in addressing MTBE led to a statewide ban in 2004.

In the 2000s, the District again demonstrated its leadership and commitment to aggressively protecting groundwater resources in response to the discovery of perchlorate contamination at a former flare manufacturing facility in Morgan Hill. Perchlorate was discovered at the facility in August 2002, and further site investigation by the responsible party indicated perchlorate detections in wells several miles to the south. Due to concerns that the contamination could be larger than first assumed, the District initiated its own sampling program, which included over 1,000 wells. As a result of this data, the Central Coast Water Board expanded and expedited the site investigation and clean-up activities. To ensure the safety of South County residents who rely on groundwater for their drinking water the District also initiated a temporary bottled water program for well owners impacted by perchlorate. The District is continuing to work with the Central Coast Water Board, the County, the cities of Morgan

Hill and Gilroy, and the local residents through the Perchlorate Community Advisory Group to assure that the contaminated groundwater is cleaned up as soon as possible.

APPENDIX B – DOCUMENTS REGARDING ADOPTION AND PUBLIC PARTICIPATION

Board Resolution Adopting 2012 GWMP



RESOLUTION NO. 12- 59

RESOLUTION OF THE BOARD OF DIRECTORS
OF SANTA CLARA VALLEY WATER DISTRICT
APPROVING THE 2012 GROUNDWATER MANAGEMENT PLAN

WHEREAS, the Santa Clara Valley Water District Act (California Water Code Appendix, Chapter 60) provides the Santa Clara Valley Water District (District) with broad groundwater management authority, including the authority to protect, spread, store, retain, and cause water to percolate in the soil within Santa Clara County; and

WHEREAS, pursuant to such authority, the District has prepared the 2012 Groundwater Management Plan (GWMP); and

WHEREAS, District staff presented information on the draft 2012 GWMP to the Water Retailers Groundwater Subcommittee representing key basin stakeholders on several occasions; and

WHEREAS, the District did, on July 10 and 24, 2012, conduct public hearings for purposes of receiving input with regard to the draft 2012 GWMP, and consider the inclusion of appropriate comments as input to the 2012 GWMP.

NOW, THEREFORE BE IT RESOLVED THAT the Board of Directors of the Santa Clara Valley Water District DOES HEREBY approve the 2012 GWMP.

PASSED AND ADOPTED by the Board of Directors of Santa Clara Valley Water District by the following vote on July 24, 2012.

AYES:	Directors	D.Gage, P. Kwok, T. Estremera, J. Judge, R. Santos, B. Schmidt, L. LeZotte
NOES:	Directors	None
ABSENT:	Directors	None
ABSTAIN:	Directors	None

SANTA CLARA VALLEY WATER DISTRICT

By: Linda J. LeZotte
LINDA J. LEZOTTE
Chair/Board of Directors

ATTEST: MICHELE L. KING, CMC

Michele L. King
Clerk/Board of Directors

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Public Notices for 2012 GWMP

Court bars mandatory life terms for juveniles

Individual judges can use no-parole sentences, however

By Jesse J. Holland
Associated Press

WASHINGTON — The U.S. Supreme Court on Monday continued to limit how severely states may punish juvenile criminals, saying it is unconstitutional to mandate life in prison without parole for youth offenders convicted of murder.

The 5-4 decision split along ideological lines: The court's four liberals and swing vote Justice Anthony Kennedy joined to order states and the federal government to allow judges and juries to consider a juvenile's age when they hand down sentences for some of the harshest crimes, instead of automatically sending them to prison for life without parole.

By making youth "irrelevant to imposition of that harshest prison sentence, such a scheme poses too great a risk of disproportionate punishment," wrote Justice Elena Kagan, who was joined in the majority opinion by Kennedy and Justices Ruth Bader Ginsburg, Stephen Breyer and Sonia Sotomayor.

Following recent decisions outlawing the death penalty and life in prison for non-murders for juveniles, the *Supreme Court*, voting 5-4, said states violate the constitutional ban on cruel and unusual punishment when they don't allow for the option of a shorter sentence.

California is one of 15 states that allows the life without parole sentences for juveniles but does not mandate them, unlike Arkansas and Alabama, which have the mandatory sentencing laws challenged in the Supreme Court. The Supreme Court even cited California as one of the states with a different approach in Monday's ruling. The state has 309 juveniles serving such sentences, now all adults ranging in age between their mid-20s to their mid-40s, according to California prison figures.

State Sen. Leland Yee, D-San Francisco, has been pushing legislation to abolish life without parole sentences in California.

Monday's court decision was in line with others the court has made, including ruling out the death penalty for juveniles and life without parole for young people whose crimes did not involve killing.

The court left open the possibility that individual judges could sentence juveniles to life without parole in individual cases of murder, but said state and federal laws cannot automatically impose such a sentence.

Dissenting, the court's four conservatives said nothing in the Constitution forbids laws requiring mandatory life in prison without parole for juveniles. Chief Justice John Roberts was joined in the main dissent by Justices Antonin Scalia, Clarence Thomas and Samuel Alito. According to data provided to the court, roughly 2,500 people are behind bars for life with no chance of winning their freedom for murders they committed before their 18th birthday. More than 2,000 of them were there because the sentence was mandated by a legislature.

Staff writer Howard Mintz contributed to this report.

Members of the media stand outside the Supreme Court building in Washington, D.C., on Monday. The high court ruled on campaign finance and juvenile sentencing.
ANDREW HARRER
BLOOMBERG

Montana's challenge of corporate campaign finance ruling rejected

By Mark Sherman
Associated Press

WASHINGTON — The Supreme Court on Monday turned away a plea to revisit its 2-year-old campaign finance decision in the Citizens United case and instead struck down a Montana law limiting corporate campaign spending.

The same five conservative justices in the Citizens United majority that freed corporations and labor unions to spend unlimited amounts in federal elections joined Monday to reverse a Montana court ruling upholding the state's century-old law. The four liberal justices dissented.

"The question presented in this case is whether the holding of Citizens United applies to the Montana state law. There can be no serious doubt that it does," the court said in an unsigned opinion.

The Citizens United decision paved the way for unlimited spending by corporations and labor unions in elections for Congress and the president, as long as the dollars are independent of the campaigns they are intended to help.

But Montana aggressively defended its 1912 law against a challenge from corporations seeking to be free of spending limits, and the state Supreme Court sided with the state.

The state court said a history of corruption showed the need for the limits, even as Justice Anthony Kennedy declared in his Citizens United opinion that independent expenditures by corporations "do not give rise to corruption or the appearance of corruption."

In a brief dissent Monday, Justice Stephen Breyer said campaign spending since 2010 "casts grave doubt on the court's supposition that independent expenditures do not corrupt or appear to do so."

State leaders in Montana swiftly condemned the decision.

Montana Attorney General Steve Bullock called the nation's high court just "another political body," while Gov. Brian Schweitzer says the Supreme Court is now endorsing "dirty, secret, corporate, foreign money."

Twenty-two states and the District of Columbia, as well as Sen. John McCain and other congressional champions of stricter regulations on campaign money, joined with Montana.

New York Attorney General Eric Schneiderman said Monday's "decision gives short shrift to states' vital interests in protecting their democratic processes and institutions from the threats posed by unlimited corporate spending in campaigns."

Public Hearing Notice

2012 Groundwater Management Plan

Santa Clara Valley Water District

Who: Santa Clara Valley Water District Board of Directors
What: Public Hearing to Receive Comments
When: July 10, 2012, 9 a.m.
Where: Santa Clara Valley Water District Board Room
5700 Almaden Expressway San Jose, CA 95118

What:
Please join the Santa Clara Valley Water District to discuss the 2012 Groundwater Management Plan (GWMP). The plan describes basin conditions and identifies basin management objectives (BMOs), strategies, and outcome measures to gauge performance. The plan also documents existing and potential management actions to achieve the BMOs. Clear documentation of these actions and the performance evaluation process will help the District respond to risks and uncertainties that may impact the quality or quantity of groundwater supplies. These challenges include droughts, increased demand, regulatory changes, constituents of emerging concern, recharge limitations due to dam restrictions, reduced availability of imported water or other supplies, and intensified land development.

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Forum may break Syria impasse

Meeting of leaders comes after attack on TV station

By Elizabeth A. Kennedy
Associated Press

AGENCE FRANCE-PRESSE VIA GETTY IMAGES

A picture released by the official Syrian news agency SANA shows a general view of damage at the site of an attack on the pro-government Al-Ikhbariya TV station outside Damascus, where seven employees were killed on Wednesday.

BEIRUT — Gunmen attacked a pro-government TV station Wednesday near the Syrian capital, killing seven employees in the latest barrage of violence as world powers prepared for a high-level meeting that the U.S. hopes will be a turning point in the crisis.

Invitations to Saturday's gathering in Geneva were sent by special envoy Kofi Annan to the five permanent members of the U.N. Security Council — including Syrian allies Russia and China — but not to major regional players Iran and Saudi Arabia.

The absence of those two countries, as well as the lack of any appetite for international military intervention, could make it difficult for the group to find the leverage to end the bloodshed in Syria. An effort by Annan to broker a peace plan failed earlier this year.

Diplomatic hopes have rested on Russia — Syria's most important ally and protector — agreeing on a transition plan that would end the Assad family dynasty, which has ruled Syria for more than four decades. But Moscow has rejected efforts by outside forces to end the conflict or any plan to force regime change in Damascus.

The United Nations said Wednesday that the conflict, which began in March 2011 as part of the Arab Spring that swept aside entrenched leaders across the region, is descending into sectarian warfare.

President Bashar Assad has so far appeared largely impervious to world pressure, and he has warned the international community from meddling in the crisis, which has seen a sharp escalation in violence in recent months. He said this week that his country is in "a genuine state of war," an increasingly common refrain from the Syrian leader.

Assad denies there is any popular will behind the uprising, which is in its 16th month, saying terrorists are driving a foreign conspiracy to destroy the country. Activists say more than 14,000 people have been killed in the violence.

An Associated Press photographer said the attack on the Al-Ikhbariya TV station in the town of Drousha, about 14 miles south of the capital Damascus, left bloodstains on the ground and bullet holes in the walls. The attack heavily damaged five portable buildings used for offices and studios.

Al-Ikhbariya is privately owned but strongly supports the regime.

"What happened today is a massacre," Information Minister Omran al-Zoebi said. He blamed terrorists — the same term the government uses for rebels.

The rebels deny they target the media. Activists blamed the attack on elite Syrian troops who defected from the regime Tuesday. The allegation could not be independently confirmed.

Chinese boats raise tension in sea dispute

By Jim Gomez
Associated Press

MANILA, Philippines — Chinese fishing boats have returned to a lagoon in a disputed South China Sea shoal despite an agreement to clear the area of all vessels, dashing hopes of an early resolution of a territorial rift with the Philippines, officials in Manila said Wednesday.

Meanwhile, Vietnam protested a Chinese state oil company's invitation for bids for energy development in different area of the South China Sea, adding to concern that tension in the disputed waters could escalate.

Long-standing disputes involving China, the Philippines, Vietnam, Taiwan, Malaysia and Brunei straddle busy sea lanes that are believed to be rich in oil and gas deposits. Many fear the disputes could spark a conflict.

The standoff between China and the Philippines in the Scarborough Shoal off the northwestern Philippines began in April when the Philippines accused Chinese fishermen of poaching in its exclusive economic zone. During the tensions, both sides have sent government ships to the area.

A recent agreement saw both countries withdraw vessels, but the Philippines Department of Foreign Affairs spokesman, Raul Hernandez, said six Chinese fishing boats and 17 smaller dinghies were spotted by a Philippine plane inside the lagoon on Monday afternoon. He said five Chinese government ships were sighted outside the lagoon in the vicinity of the shoal.

Hernandez urged China to abide by its commitment in talks aimed at diffusing the rift. "It is important for parties in negotiations and discussion on any issue to always act in good faith," he said.

The Chinese Embassy in Manila did not reply to a request for comment.

India: Evidence Pakistan in on attacks

Kirachi site linked to Mumbai attack, authorities say

By Hari Kumar
New York Times

NEW DELHI — India's home minister said Wednesday there was new evidence of Pakistani state support for the 2008 Mumbai attacks, citing information provided by Abu Jindal, an Indian man suspected of being one of the planners.

The Indian authorities say that Jindal, who was recently captured by the Indian police, and five others guided the Mumbai attacks from a "control room" in Karachi, Pakistan.

The authorities in India say they have recordings of phone conversations during the attack that included Jindal's voice.

At a news conference in Tiruananthpuram, Home Minister Palaniappan Chidambaram said that Jindal confirmed during an interrogation that he was in the Karachi control room that had given orders to the 10 gunmen who killed more than 160 people in a three-day attack on multiple locations in Mumbai in 2008.

"Some state support was there for these people," Chidambaram said, referring to men in the control room with Jindal. And he claimed that Jindal had identified some of those other men, adding that any argument that there was no Pakistani state involvement "is no longer valid."

"The way we are going has put us in a good light and put Pakistan in a bad light," he added. "It is Pakistan which is under pressure and not India."

Pakistan has rejected Indian accusations that its top military spy agency, Inter-Services Intelligence, was involved in the attacks, which are thought to have been carried out by the militant group Lashkar-e-Taiba.

On Wednesday, Rehman Malik, a senior adviser to the Pakistani president on interior issues, denied the new charges as well. "Why are you blaming Pakistan?" he said Wednesday at a news conference. "He is your citizen. You fail to control your citizen."

Pakistan warned India three years ago that it had its "own Taliban," Malik said. "See the result. I wish best of luck to India." Indian intelligence experts said that the arrest of Jindal was more significant than that of Ajmal Qasab, the last known surviving attacker. Ajit Doval, former chief of India's Intelligence Bureau said: "Abu Jindal is more important because he is the eyewitness in what happened in Pakistan during the attack and about preparations. He is a planner, organizer, motivator and trainer. Qasab is only a one-event man."

Australia saves 130 from capsized ship

By Matt Siegle
New York Times

SYDNEY — Australian officials said Wednesday that 130 survivors, most of them reported to be women and children, had been rescued after a ship full of apparent asylum seekers trying to reach Australia capsized in the Indian Ocean.

The Australian Customs and Border Protection Authority said there were 124 people aboard and that four had died in the accident, which occurred about 115 miles south of the main Indonesian island of Java — roughly halfway to Christmas Island, a remote Australian territory that has become a magnet for immigration attempts in overcrowded boats.

The capsizing was the second major accident in those waters involving asylum seekers in less than a week.

The Australian Maritime Safety Authority said in a statement that the survivors had been picked up by an Australian naval patrol boat and several merchant ships that responded to the stricken vessel's distress call early Wednesday.

As recently as Sunday, the navy was searching the same area for survivors or bodies from another rickety boat that capsized last Thursday.

Some 90 people are thought to have died in that accident; about 110 were rescued.

The episodes are the latest in a long line of maritime disasters involving asylum seekers trying to reach Australian territory. In December 2010, about 48 people died when their boat broke apart against Christmas Island's rocky coast in front of horrified onlookers.

Last December, about 200 died when their overcrowded ship sank off Java.

Taliban puts on bloody display

Pakistani soldiers' heads displayed

By Ishtiaq Mahsud
Associated Press

DERA ISMAIL KHAN, Pakistan — The Taliban released a video Wednesday that they say shows the heads of 17 Pakistani soldiers captured in a cross-border raid from Afghanistan this week and beheaded.

In violence Wednesday, a bomb in a railway station in Pakistan's southwest killed at least five people, police said, and the leader of an anti-Taliban militia was killed in Peshawar in the northwest.

The Pakistani Taliban's bloody cross-border raid Sunday night showed the threat still posed by the group, despite multiple army offensives. Increasingly, the militants have used sanctuaries in eastern Afghanistan to attack border areas in Pakistan's northwest.

Pakistan has criticized NATO and Afghan forces for not doing enough to stop the attacks, but it has received little sympathy. The Afghan government and its allies have long faulted Pakistan for failing to target Afghan Taliban militants and their allies who use Pakistani territory to launch attacks in Afghanistan.

The Pakistani and Afghan Taliban are allies, but the former has focused on fighting the Pakistani government, while the latter has concentrated on attacking foreign and local forces in Afghanistan.

The Pakistani Taliban said in the video that they killed 18 soldiers, but 17 heads were displayed on a bloody white sheet on the ground outside.

Public Hearing Notice

2012 Groundwater Management Plan

Santa Clara Valley Water District

Who: Santa Clara Valley Water District Board of Directors

What: Public Hearing to Receive Comments

When: July 10, 2012, 9 a.m.

Where: Santa Clara Valley Water District Board Room
5700 Almaden Expressway San Jose, CA 95118

What:
Please join the Santa Clara Valley Water District to discuss the 2012 Groundwater Management Plan (GWMP). The plan describes basin conditions and identifies basin management objectives (BMOs), strategies, and outcome measures to gauge performance. The plan also documents existing and potential management actions to achieve the BMOs. Clear documentation of these actions and the performance evaluation process will help the District respond to risks and uncertainties that may impact the quality or quantity of groundwater supplies. These challenges include droughts, increased demand, regulatory changes, constituents of emerging concern, recharge limitations due to dam restrictions, reduced availability of imported water or other supplies, and intensified land development.

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P.O. BOX 20670
SAN JOSE, CA - 95160-0670

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of SANTA CLARA) ss

Notice Type: GOV - GOVERNMENT LEGAL NOTICE

Ad Description:
2012 GROUNDWATER MANAGEMENT PLAN

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the SAN JOSE POST-RECORD, a newspaper published in the English language in the city of SAN JOSE, county of SANTA CLARA, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SANTA CLARA, State of California, under date 02/03/1922, Case No. 27844. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

06/27/2012, 06/29/2012

Executed on: 06/29/2012
At Los Angeles, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

SJ#: 2327592

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6/27, 6/29/12

SJ-2327592#

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APPENDIX C – DISTRICT RESERVOIRS AND RECHARGE FACILITIES

District Reservoirs

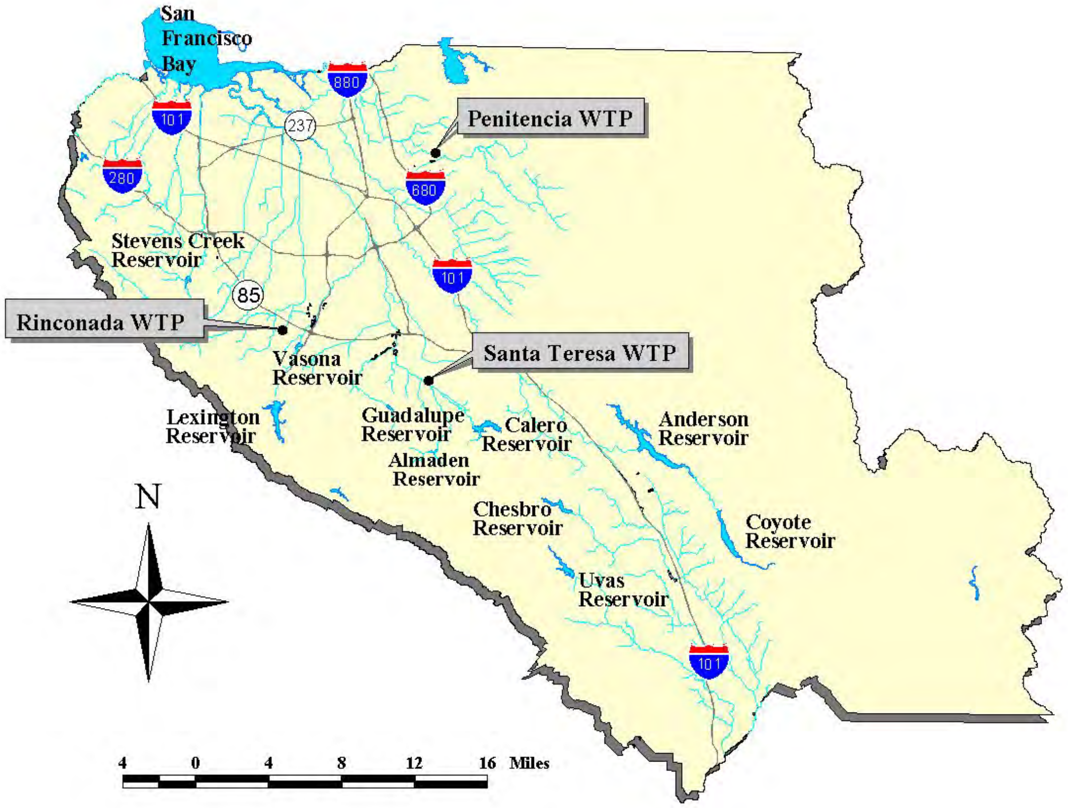
Local reservoirs are used to capture and store local runoff and imported water for beneficial use including groundwater recharge and treatment for drinking water. As noted in Table C-1 below, several of the reservoirs have restricted capacity due to dam safety operating restrictions. The District's reservoirs are also shown in Figure C-1.

Table C-1 Original and Restricted Capacities of Major District Reservoirs

Reservoir	Year Built	Reservoir Capacity (AF)	Restricted Capacity (AF)	Use
Almaden*	1935	1,586	1,472	Groundwater recharge, Treated for drinking water
Anderson*	1950	90,373	61,810	Groundwater recharge, Treated for drinking water
Calero*	1935	9,934	4,585	Groundwater recharge, Treated for drinking water
Chesbro	1955	7,945	7,945	Groundwater recharge
Coyote*	1936	23,244	12,382	Groundwater recharge, Treated for drinking water
Guadalupe*	1935	3,415	2,218	Groundwater recharge
Lexington	1952	19,044	19,044	Groundwater recharge
Stevens Creek	1935	3,138	3,138	Groundwater recharge
Uvas	1957	9,835	9,835	Groundwater recharge
Vasona	1935	495	495	Groundwater recharge
TOTAL		169,009	122,924	

* Reservoirs with dam safety operating restrictions

Figure C-1 Location of District Reservoirs and Water Treatment Plants



District Recharge Facilities

The District's managed recharge program uses both runoff captured in local reservoirs and imported water delivered by the raw water conveyance system to recharge the basin through more than 390 acres of off-stream ponds and over 90 miles of local creeks.

The recharge facilities have been organized into seven systems based on watersheds, as described below. The facilities have been sorted in this way to simplify describing management of a complex and interconnected network. These systems are not independent, but rather share sources of supply and recharge the same groundwater subbasins. Water recharged in one system may be extracted many miles away.

Coyote Recharge System

This system has a recharge capacity of approximately 27,000 AF per year. The major features of this system include Anderson and Coyote Reservoirs and Coyote Creek in-stream recharge. Water sources for this system include the large Coyote Creek watershed, draining much of the west-facing slope of the Diablo Range. After leaving the hills below Anderson Reservoir, Coyote Creek flows north to San Francisco Bay, recharging both the Santa Clara Plain and Coyote Valley. Through the Santa Clara Conduit, water from this system can also be diverted south into the Llagas Water Supply Management Systems, recharging the Llagas Subbasin. In addition to local water, imported water can be delivered to the system from the Santa Clara Conduit. Imported water can be stored in Anderson Reservoir using the Anderson Force Main, and later released to Coyote Creek or diverted to the Cross Valley Pipeline for recharge elsewhere or as a water supply source for the District's surface water treatment plants. Recharge operations have been conducted in this system since 1934.

Guadalupe Recharge System

This system has a recharge capacity of approximately 25,000 AF per year, The major features of this system include Almaden, Guadalupe, and Calero Reservoirs; Guadalupe Creek, Guadalupe River, Alamitos Creek, Calero, and Ross Creek in-stream recharge; and the Los Capitancillos, Alamitos, Kooser, and Guadalupe off-stream ponds. Water can be diverted from Almaden Reservoir to Calero Reservoir via the Almaden-Calero Canal. Local water supplies are developed from the Almaden, Guadalupe, and Calero Watersheds, and imported water from the State Water Project (SWP) and Central Valley Project (CVP) can be diverted into the system via the Cross Valley Pipeline, the Almaden Valley Pipeline, and the Central Pipeline. This system recharges the Santa Clara Plain, and water can also be diverted from Calero Reservoir to the District's surface water treatment plants via the Cross Valley Pipeline. Recharge operations have been conducted in this system since 1932.

Los Gatos Recharge System

The Los Gatos recharge system has a recharge capacity of approximately 30,000 AF per year. The major features of this system include Lexington and Vasona Reservoirs, Los Gatos Creek in-stream recharge, and several off-stream systems including Page, Kirk, Oka, McGlincey, Budd, Sunnyoaks, and Camden ponds. The majority of the source water for this system is from the Los Gatos Creek Watershed in the Santa Cruz Mountains, although imported water from SWP and CVP is also delivered to the system through the District's Central Pipeline. This system recharges the Santa Clara Plain. Recharge operations have been conducted in this system since 1934.

Penitencia Recharge System

This small system is predominately served by imported water from the SWP, although local water from the Penitencia Creek Watershed also contributes to in-stream recharge in Penitencia Creek and the Overfelt and Mabury ponds. The other facilities in the system, which exclusively recharge SWP water, include the Penitencia, Piedmont, Helmsley, and Park ponds. The system has a recharge capacity of about 7,000 AF per year and recharges the Santa Clara Plain. Recharge operations have been conducted in this system since 1934.

West Side Recharge System

This system has a recharge capacity of about 15,000 AF per year. Major facilities in the system include Stevens Creek Reservoir, the McClellan off-stream ponds, and the various streams receiving water from the Stevens Creek Pipeline including Stevens, Calabasas, Regnart, Rodeo, Saratoga, Wildcat, San Tomas, and Smith Creeks. In addition to local water from the west side watersheds, imported water from SWP and CVP is delivered to the system using the Stevens Creek Pipeline. This system recharges the Santa Clara Plain. Recharge operations have been conducted in this system since 1935.

Lower Llagas Recharge System

This system has a recharge capacity of about 21,000 AF per year. Major facilities in the system include Uvas and Chesbro Reservoirs, in-stream recharge in Llagas and Uvas Creeks, the Church off-stream ponds, and the Uvas-Llagas pipeline which can divert water from Uvas Reservoir to Llagas Creek. This system is entirely dependent on local water from the Uvas and Llagas Watersheds, and recharges the Llagas Subbasin. Recharge operations have been conducted in this system since 1955.

Upper Llagas Recharge System

This system has a recharge capacity of about 19,000 AF per year. Major facilities include Llagas in-stream recharge, the Madrone Channel, and the San Pedro and Main Avenue ponds. This system recharges the Llagas Subbasin, predominately with imported CVP water.

The facilities within each District recharge system and the associated recharge capacity are shown below in Table C-2. Table C-3 provides a summary of in-stream and off-stream recharge capacity for groundwater charge zones W2 and W5.

Table C-2 District Recharge Facilities

Groundwater Charge Zone	Recharge System	In-Stream Recharge (Creeks)	Annual Creek Recharge Capacity (AF)[1]	Off-Stream Recharge (Ponds)	Annual Pond Recharge Capacity (AF)[1]
Zone W2	**Penitencia**	Upper Penitencia Creek	2,200		
				Penitencia Ponds	3,100
				Piedmont	
				City Park Pond	
				Helmsley	
				Mabury	
				County Park Pond	
				Capitol	
				Overfelt Ponds	1,500
		Creek Total	**2,200**	**Pond Total**	**4,600**
		Recharge System Total: 6,800			
	Los Gatos	Los Gatos Creek	5,800		
				Page Ponds	5,300
				Budd Ave Ponds	5,000
				Sunnyoaks Ponds	2,200
				Camden Ponds	2,200
				McGlincey Ponds	7,700
				Oka Ponds	1,500
		Creek Total	**5,800**	**Pond Total**	**23,900**
		Recharge System Total: 29,700			
	West Side	Regnart Creek	700		
		Calabazas Creek	2,600		
		Rodeo Creek	700		
		Saratoga Creek	4,400		
		Wildcat Creek	400		
		San Tomas Creek	400		
		Smith Creek[2]	700		
		Stevens Creek	3,600		
				McClellen Ponds	1,700
		Creek Total	**13,500**	**Pond Total**	**1,700**
		Recharge System Total: 15,200			
	Guadalupe	Alamitos Creek	2,200		
		Calero Creek	900		
		Guadalupe River	4,200		
		Guadalupe Creek	2,900		
		Ross Creek	2,200		
				Alamitos Ponds	1,500
				Guadalupe Ponds	6,600
				Los Cap Ponds	2,900
				Kooser Ponds	1,700
		Creek Total	**12,400**	**Pond Total**	**12,700**
		Recharge System Total: 25,100			

Groundwater Charge Zone	Recharge System	In-Stream Recharge (Creeks)	Annual Creek Recharge Capacity (AF)[1]	Off-Stream Recharge (Ponds)	Annual Pond Recharge Capacity (AF)[1]
Zone W2	**Coyote**	Lower Coyote Creek	1,500		
				Coyote Percolation Pond[2]	10,900
Zone W5		Upper Coyote Creek	14,600		
		Creek Total	**16,100**	**Pond Total**	**10,900**
		Recharge System Total: 27,000			
	Upper Llagas	Madrone Channel[2]	10,000		
		Tennant Creek	-		
		East Little Llagas	1,100		
				Main Avenue Ponds	2,700
				San Pedro Ponds	4,700
		Creek Total	**11,100**	**Pond Total**	**7,400**
		Recharge System Total: 18,500			
	Lower Llagas	Uvas Creek	8,100		
		Llagas Creek	5,800		
				Church Ponds	7,300
		Creek Total	**13,900**	**Pond Total**	**7,300**
		Recharge System Total: 21,200			

Notes:

1. The annual recharge capacity shown assumes water is available all year and that ponds are in normal operational condition.
2. Includes in-stream spreader dam facilities.

Table C-3 District Annual Managed Recharge Capacity Summary

Groundwater Charge Zone	In-Stream Recharge (AF)	Off-Stream Recharge (AF)	Total Recharge (AF)
Zone W2	35,400	53,800	89,200
Zone W5	39,600	14,700	54,300
Total	75,000	68,500	143,500

APPENDIX D – GROUNDWATER SUBBASIN CHARACTERIZATION

This appendix describes the subbasins: their storage capacities, the inflows and outflows for each subbasin, and trends in pumping, groundwater elevation, water quality, and land subsidence. The intent of this appendix is to provide technical information on the subbasins to aid in understanding the basin management objectives and the programs and projects that support those objectives that are presented in this plan.

GROUNDWATER BASINS

Santa Clara County includes portions of two groundwater basins as defined by the California Department of Water Resources (DWR) Bulletin 118 Update 2003 (DWR, 2003): the Santa Clara Valley Basin (Basin 2-9) and the Gilroy-Hollister Valley Basin (Basin 3-3).

The Santa Clara Valley and Gilroy-Hollister Valley Groundwater Basins are located in the California Coast Ranges physiographic province. These basins generally form an elongated valley bounded by the Santa Cruz Mountains to the west and Diablo Range to the east. The basis for basin boundary delineation is the geologic, hydrologic and topographic features in the area. The geologic basin boundary is the contact between consolidated and unconsolidated sediment deposits and bedrock.

The boundary between the Santa Clara Valley and the Gilroy-Hollister Valley Groundwater Basins is the Coyote Creek alluvial fan in the Morgan Hill area, which forms a topographic and hydrologic divide between the groundwater and surface water flowing to the San Francisco Bay and water flowing to the Monterey Bay. The groundwater divide is approximately located at Cochrane Road in Morgan Hill. The boundary moves as much as a mile to the north or south depending on local groundwater conditions.

The Santa Clara Valley Basin extends from southern San Jose north into Alameda and San Mateo counties. It is divided into four subbasins, including the Santa Clara Subbasin within the District's service area. The Gilroy-Hollister Groundwater Basin extends from the groundwater divide in Morgan Hill into San Benito County, including the Llagas Subbasin within the District's service area.

GROUNDWATER SUBBASINS

While basin boundaries are primarily based on geologic and hydrologic information, subbasins are commonly based on institutional boundaries. DWR Bulletin 118 states that "subbasins are created for the purpose of collecting and analyzing data, managing water resources, and managing adjudicated basins"[5].

The District identifies three groundwater management areas within the county: Santa Clara Plain, Coyote Valley, and Llagas Subbasin. The Santa Clara Plain and Coyote Valley are part of the Santa Clara Subbasin. Although hydraulically connected to the Santa Clara Plain, the District refers to the Coyote Valley separately since it is largely agricultural and relies primarily on independent pumpers, unlike the Santa Clara Plain which is largely urban and primarily served by major water retailers.

This plan covers only the areas within Santa Clara County managed by the District: the Santa Clara Subbasin (DWR Basin 2-9.02) and the Llagas Subbasin (DWR Basin 3-3.01). The hydrogeology of the three groundwater management areas is summarized in the following sections. Basin boundaries as defined in DWR Bulletin 118 as well as the District groundwater management areas are shown in Figure D-1.

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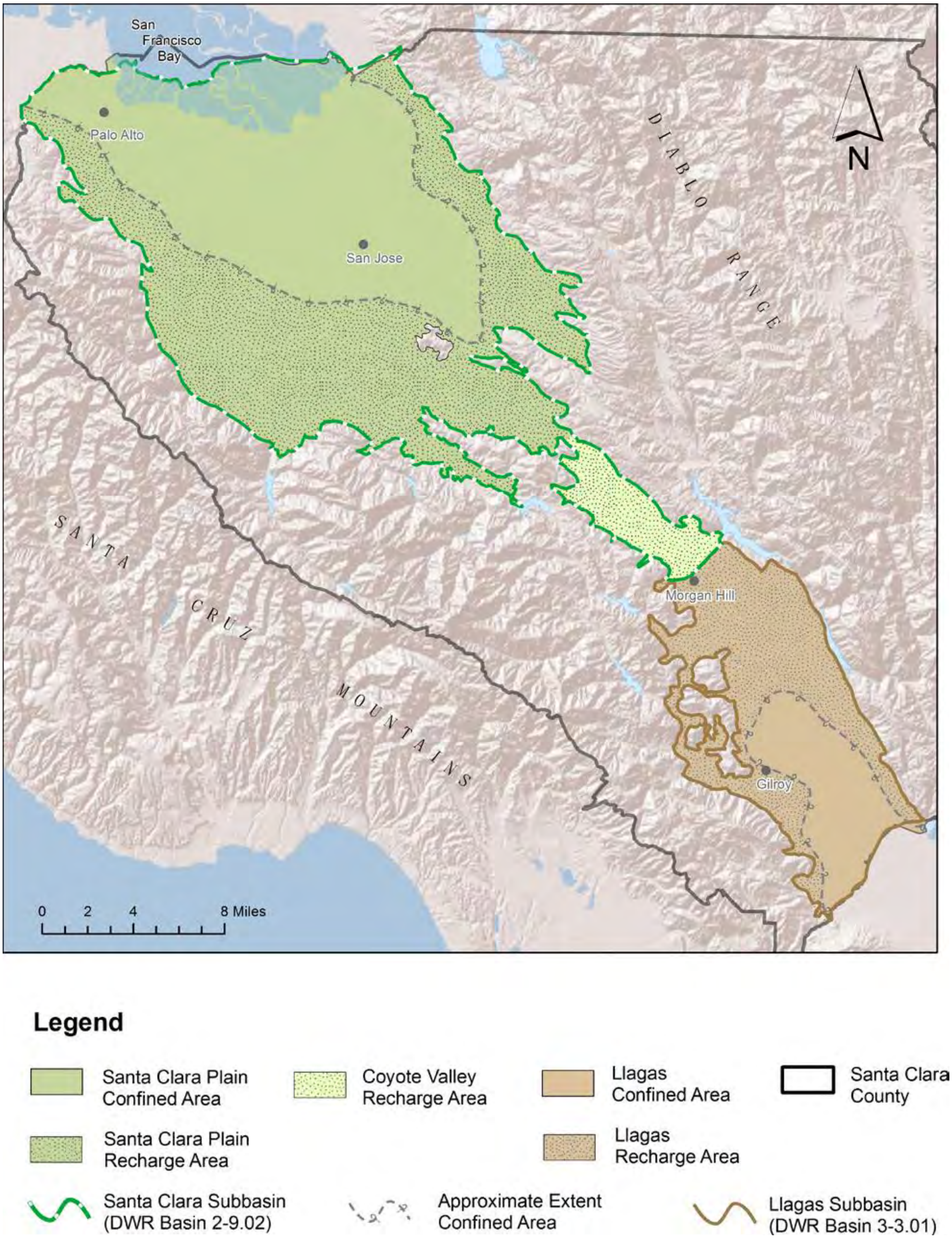
[5] California Department of Water Resources, California's Groundwater: Bulletin 118 Update 2003.

Figure D-1 Santa Clara County Subbasins



Santa Clara Plain

Santa Clara Plain Hydrogeology

The Santa Clara Plain is the northern area of the Santa Clara Subbasin, which is the southern extension of the Santa Clara Valley Groundwater Basin. The Santa Clara Plain is 280 square miles comprising a large trough-like depression filled with alluvium, or unconsolidated sediments such as gravel, sand, silt and clay that were deposited from the mountains by water and gravity into the valley. The alluvium comprises inter-fingering alluvial fans, stream deposits and terrace deposits. The thickness of the alluvium varies from a few feet at the subbasin boundaries to over 1,500 feet in the basin interior[6]. The alluvium thins towards the western and eastern edges of the Santa Clara Plain.

The Santa Clara Plain is divided into confined and recharge (unconfined) areas (Figure D-1). The recharge area includes the alluvial fan and fluvial deposits found along the edge of the groundwater subbasin where high lateral and vertical permeability allow surface water to infiltrate the aquifers. The percolation of surface water in recharge areas replenishes unconfined groundwater within the recharge area and contributes to the recharge of deep aquifers in the confined area through subsurface flow. As groundwater pumping exceeds natural recharge, the District operates managed groundwater recharge facilities within the recharge area to replenish groundwater storage.

The confined area of the Santa Clara Plain is located in the northern and central portion of the subbasin. It is characterized by upper and lower aquifers, divided by laterally extensive low permeability materials such as clays and silts, which restrict the vertical flow of groundwater. The District refers to these aquifers as the shallow and principal aquifer zones, respectively. Principal aquifers are less vulnerable to contamination than shallow aquifers since the confining layers also restrict the movement of contaminants that may be present in infiltrating water. The boundary between the confined and recharge areas is a simplification of the natural conditions in the subbasin and two prior versions of this boundary have been published by the USGS[7] and State Water Resources Control Board[8]. A generalized cross-section of the Santa Clara Plain is shown in Figure D-2.

Although most areas in the confined area of the Santa Clara Plain are approximately at sea level and have an imperceptible slope, there are areas which lie below sea level as a result of historic inelastic land subsidence. From about 1915 to 1966, groundwater pumping increased dramatically due to growing agricultural use and population growth, resulting in a decline of groundwater levels by as much as 200 feet. As a result of overdraft, fluid pressure in the pores of aquifer systems was reduced, resulting in the compression of clay layers and a sinking of the land surface. The land surface subsided by about 13 feet in downtown San Jose and 3 to 6 feet in a larger area which encompasses north San Jose, Santa Clara, Sunnyvale, and Mountain View. Serious problems developed as a result of subsidence including flooding of lands adjacent to San Francisco Bay, decreased ability of local streams to carry away winter flood waters, and damage to well casings. It is estimated that subsidence resulted in at least $30 to $40 million in damage in 1982 dollars[9]. This necessitated the construction of additional dikes, levees, and flood control facilities to protect properties from flooding.

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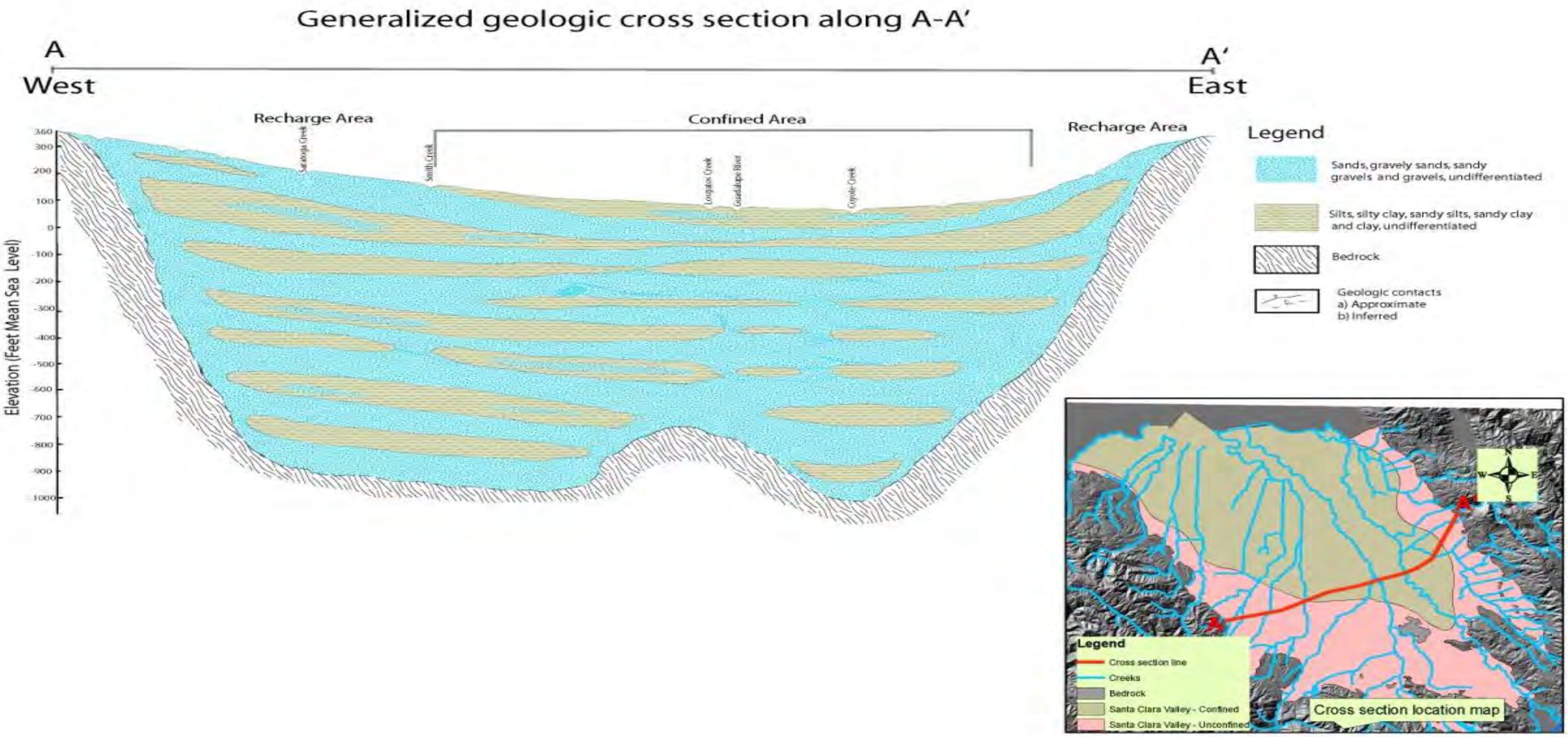
[6] Santa Clara Valley Water District, Standards for the Construction and Destruction of Wells and other Deep Excavations in Santa Clara County, June 1989.

[7] USGS, Ground water in Santa Clara Valley, California, Water-Supply Paper 519, 1924.

[8] California State Water Resources Control Board, Santa Clara Valley Investigation, Bulletin Number 7, 1955.

[9] USGS, Land Subsidence in the Santa Clara Valley, California, as of 1982, Professional Paper 497-F, 1988.

Figure D-2 Santa Clara Plain Generalized Cross Section



San Jose was the first area in the United States where inelastic land subsidence due to groundwater withdrawal was recognized[10]. Land subsidence was effectively halted by the District by 1970 through the importation of surface water, managed recharge, and careful management of the aquifer system. However, the potential for renewed subsidence is an ongoing concern, and the District manages water supplies to minimize the risk of renewed inelastic land subsidence.

Groundwater in the Santa Clara Plain is found at different depths in the unconfined aquifer and under artesian conditions in the confined aquifer. Groundwater movement generally follows surface water patterns, flowing to the northwest. Local groundwater also moves toward areas of intense pumping. Regional groundwater elevations in the Santa Clara Plain range from about 60 to 90 feet below mean sea level in the middle of the subbasin to about 220 to 480 feet above mean sea level near the southern extent of the eastern and western hills of the Santa Clara Plain. There has been a significant rebound in groundwater levels since the District's managed groundwater recharge program was started. As seen in the hydrograph typical seasonal fluctuations are about 10 to 20 feet.

Santa Clara Plain Storage Capacity

The operational storage capacity of the Santa Clara Plain has previously been estimated to be 350,000 AF[11]. The operational storage capacity represents the volume of groundwater that can be stored based on the District's management strategy, which accounts for the avoidance of adverse impacts such as inelastic land subsidence and salt water intrusion. The District is currently working to refine this estimate based on historically observed data.

Santa Clara Plain Water Budget

A water budget for the Santa Clara Plain for calendar years 2002 through 2011 is shown in Table D-1. The water budget is based on the District groundwater flow model for the Santa Clara Plain, and represents inflows and outflows for the principal aquifer. A majority of the inflow to the Santa Clara Plain is a result of managed recharge of local and imported supplies. Although the water budget can vary significantly from year to year, on average, there was a slight annual increase in storage for the Santa Clara Plain over this 10 year period.

Santa Clara Plain Land Subsidence Trends

Groundwater levels have recovered over time due to several factors including considerable surface water imports, the construction of facilities for the recharge of local and imported surface water, treated water deliveries, and water use efficiency programs. These activities have helped to take the burden off groundwater subbasins. Proactive conjunctive water management by the District helps to ensure that the potential for renewed inelastic subsidence is minimized. Currently, groundwater levels at key wells show that subbasin groundwater elevations are above subsidence thresholds, and inelastic land surface subsidence risk is low.

Santa Clara Plain Groundwater Elevation Trends

Groundwater elevations are affected by natural and managed recharge and groundwater extraction and are an indicator of how much groundwater is in storage at a particular time. Both low and high elevations can cause adverse conditions. Low groundwater levels can lead to land subsidence or salt water intrusion and high water levels can lead to nuisance conditions for below ground structures. Figure D-3 shows a typical hydrograph for the Santa Clara Plain. Annual fluctuations reflect both increased recharge in winter and spring and increased pumping in summer.

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[10] Tolman, C. F., and Poland, J. F., Ground-water Infiltration, and Ground-surface Recession in Santa Clara Valley, Santa Clara County, California, Eos Trans. AGU, 21, 23– 34, 1940.

[11] Santa Clara Valley Water District, 2001 Groundwater Management Plan, July 2001.

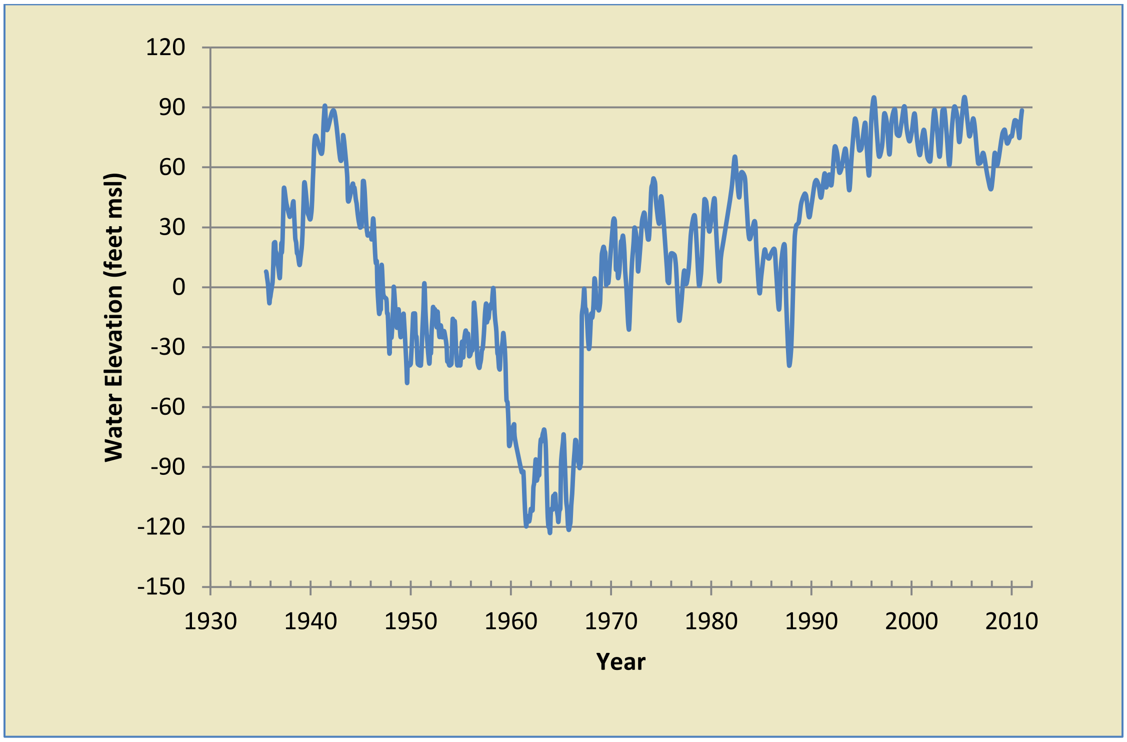
Table D-1 Santa Clara Plain Principal Aquifer Water Budget (2002 to 2011)

Water Budget Component	Acre-Feet
Inflow	
Managed Recharge	64,000
Natural Recharge	30,000
Subsurface Inflow	8,000
Total Inflow	102,000
Outflow	
Groundwater Pumping	95,000
Subsurface Outflow	6,000
Total Outflow	101,000
Change in Storage	1,000

Notes:

1. Managed recharge represents direct replenishment by the District using local and imported water.
2. Natural recharge includes all uncontrolled recharge, including the deep percolation of rainfall, septic system and/or irrigation return flows, and natural seepage through creeks.
3. Subsurface inflow represents inflow from adjacent aquifer systems, including inflow from the Coyote Valley.
4. Groundwater pumping is based on pumping reported by water supply well owners.
5. Subsurface outflow represents outflow to adjacent aquifer systems, including outflows to San Francisco Bay.

Figure D-3 Groundwater Elevation in Santa Clara Plain Well 07S01W25L001



The increasing groundwater levels through the late 1930s and early 1940s can be attributed to the construction of many of the District's local reservoirs and increased recharge programs. Downward trends starting in the 1940s reflect growing population and industrial demands in Silicon Valley. The general increase in groundwater levels in the late 1960s and 1970s coincides with the delivery of State Water Project water to the area through the South Bay Aqueduct and the completion of the District's first two treatment plants, Rinconada and Penitencia Water Treatment Plants. Although there was a significant drought between 1987 and 1992, groundwater levels in the subbasin actually started to improve beginning in 1989 due to the addition of federal San Felipe Project deliveries to the area, the completion of the District's largest treatment plant (the Santa Teresa Water Treatment Plant), and calls for conservation.

Santa Clara Plain Groundwater Pumping Trends

Subbasin water levels, which are generally indicative of storage, are strongly influenced by groundwater pumping. The distribution and pumping of these wells for 2010 indicate that the greatest numbers of high production wells (500 to 4,000 AF per year) are in the central and southern portion of the Santa Clara Plain as shown in Figure D-4.

Annual groundwater production for the San Jose Plain since 1970 is shown in Figure D-5. For the time period shown, a maximum of 181,000 AF was pumped in the Santa Clara Plain in 1985. A sharp decrease in groundwater pumping can be noted in 1989, the year the District's third and largest water treatment plant (Santa Teresa) came on-line to utilize water imported from the Central Valley Project. Prior to 1989, the average annual pumping in the Santa Clara Plain was 157,000 AF. After Santa Teresa came on-line, average pumping dropped to 106,000 AF per year. Managed recharge provides the majority of water available for groundwater production, as shown in Table D-1 and Figure D-5.

Santa Clara Plain Groundwater Quality

The Santa Clara Plain generally produces water of excellent quality for municipal, irrigation, and domestic supply. Within the Santa Clara Plain, calcium and magnesium constitute the principal cations and bicarbonate is the most prevalent anion. Total dissolved solids (TDS) content is typically 200 to 500 mg/L, with the exception of localized areas including the Evergreen area of San Jose and Palo Alto. The median TDS content for the principal aquifer zone is 400 mg/L. Some shallow aquifers adjacent to the San Francisco Bay have been affected by salt water intrusion, and high TDS is noted in some wells close to the bay. Typically, very few wells sampled each year contain contaminants above primary maximum contaminant levels (MCL)[12]. A summary of the shallow and principal aquifer water quality from 2002 to 2011 is presented in Tables D-2 and D-3, respectively.

Tables D-4 and D-5 present the organic chemicals that were detected between 2002 and 2011 in the shallow and principal aquifers, respectively. Although some organic chemicals have been detected in the Santa Clara Plain, detections are infrequent and are typically low concentrations[13].

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[12] Santa Clara Valley Water District, 2010 Groundwater Quality Report, June 2011.

[13] Lawrence Livermore National Laboratory, California Aquifer Susceptibility, A Contamination Vulnerability Assessment for the Santa Clara and San Mateo County Groundwater Basins, 2004.

Figure D-4 2010 Groundwater Pumping in the Santa Clara and Llagas Subbasins

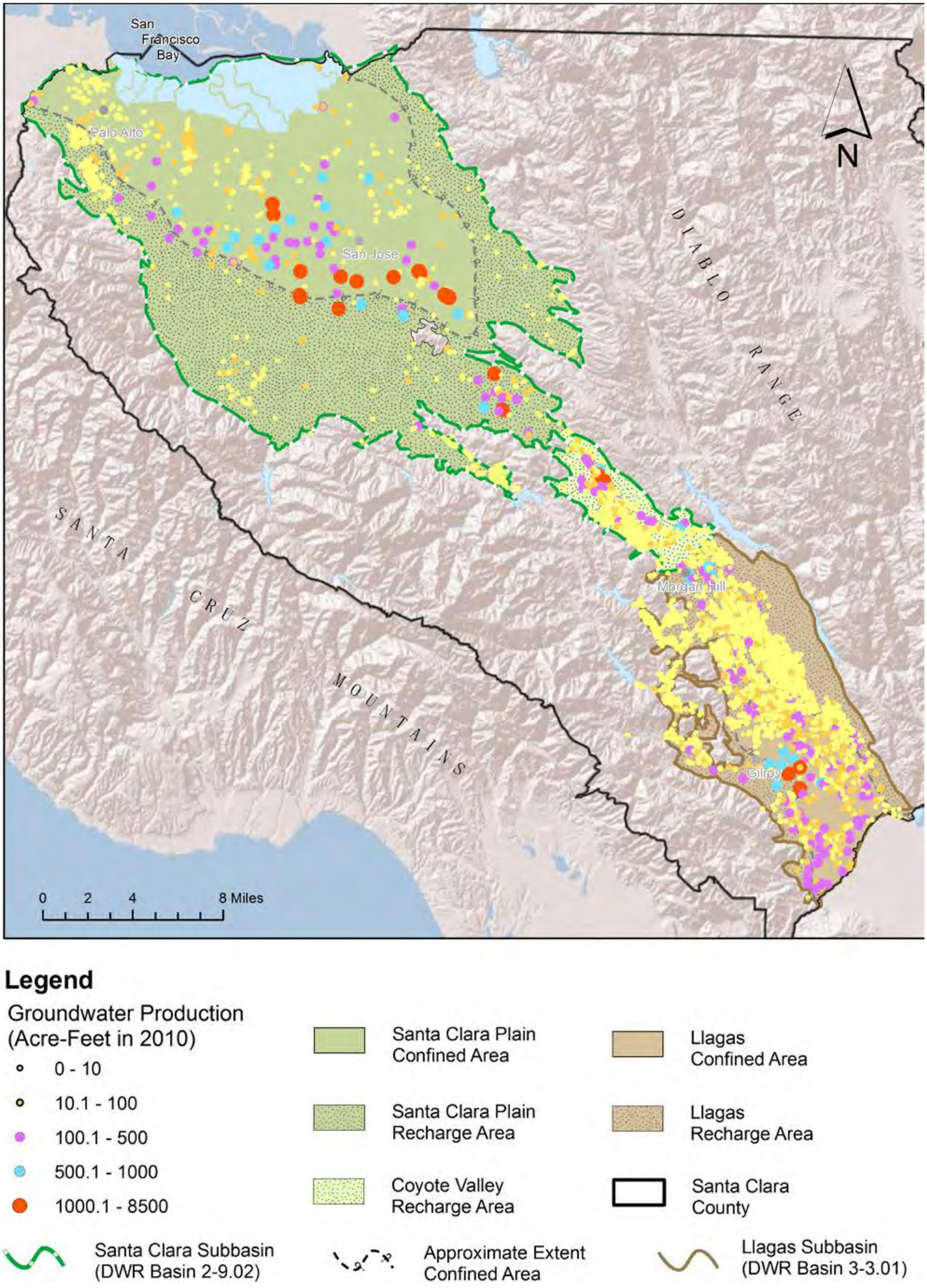

Figure D-5 Santa Clara Plain Groundwater Pumping and Managed Recharge

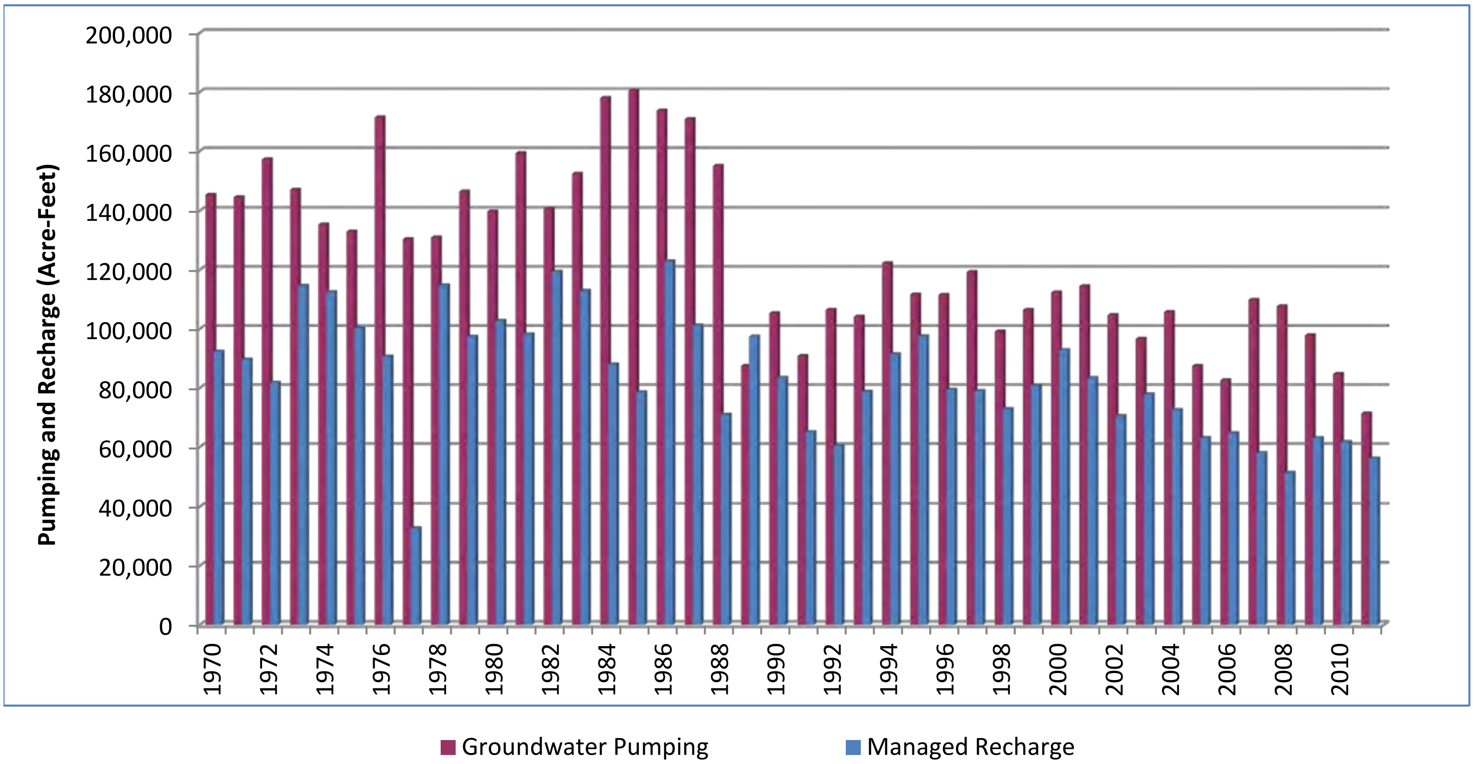

Table D-2 Santa Clara Plain Shallow Aquifer Zone[1] Groundwater Quality Summary Statistics

Parameter[2]	2002 - 2011 Results[3]			Population Median[4]		MCL[5]		n[6]
	25th Percentile	50th Percentile (Median)	75th Percentile	Lower	Upper	Primary	Secondary	
Aluminum (ug/L)	12.3	23.0	43.0	14.4	36.9	1,000	200	34
Arsenic (ug/L)	0.37	1.0	2.6	0.42	2.3	10	NE	33
Barium (ug/L)	75.5	118	170	91.2	140	1.000	NE	33
Boron (ug/L)	148	234	371	186	295	NE	NE	34
Cadmium (ug/L)	--	<1	--	--	--	5	NE	33
Chloride (mg/L)	43.0	62.0	93.0	49.0	86.0	NE	250	35
Chromium, Total (ug/L)	--	<10	--	--	--	50	NE	33
Copper (ug/L)	--	<50	--	--	--	NE	1,000	33
Fluoride (mg/L)	0.10	0.15	0.23	0.10	0.21	2	NE	27
Iron (ug/L)	6.6	25.1	95.7	11.5	55.0	NE	300	34
Lead (ug/L)	--	<5	--	--	--	NE	NE	137
Manganese (ug/L)	23.3	75.1	241.7	41.6	136	NE	50	33
Mercury (ug/L)	--	<1	--	--	--	2	NE	124
Nickel (ug/L)	1.8	3.4	6.3	2.1	5.3	100	NE	33
Nitrate as NO3 (mg/L)	0.30	1.4	6.4	0.60	3.3	45	NE	35
Perchlorate (ug/L)	--	<4	--	--	--	6	NE	145
Selenium (ug/L)	--	<5	--	--	--	50	NE	139
Silver (ug/L)	--	<10	--	--	--	NE	100	138
Specific Conductance (µS/cm)	674	927	1,394	752	1,275	NE	900	36
Sulfate (mg/L)	44.3	64.7	189	52	84.9	NE	250	35
Total Dissolved Solids (mg/L)	410	588	840	440	820	NE	500	31
Zinc (ug/L)	--	<50	--	--	--	NE	5,000	34

Notes:

1. The shallow aquifer zone is represented by wells primarily drawing water from depths less than 150 feet.
2. ug/L= micrograms per liter (or parts per billion); mg/L = milligrams per liter (or parts per million); µS/cm = microSiemens per centimeter
3. The percentile is the value below which a certain percent of observations fall (e.g., the 50th percentile, or median, is the value below which half of the observations fall). For parameters with results reported at multiple reporting limits, the Maximum Likelihood Estimate (MLE) method is used.
   -- indicates the value was not computed since more than 80% of all results are non-detect. In these cases, the exact value of the median cannot be determined and the value shown represents the highest detection limit.
4. The lower and upper estimates of the population median are determined using a 95% confidence interval (alpha = 0.05).
5. Primary and secondary maximum contaminant levels (MCLs) are from the California Code of Regulations. Primary MCLs are health-based drinking water standards, while secondary MCLs are aesthetic-based standards. For secondary MCLs with a range, the lower, recommended threshold is shown. NE= Not Established
6. n represents the number of wells tested.

Table D-3 Santa Clara Plain Principal Aquifer Zone[1] Groundwater Quality Summary Statistics

Parameter[2]	2002 - 2011 Results[3]			Population Median[4]		MCL[5]		n[6]
	25th Percentile	50th Percentile (Median)	75th Percentile	Lower	Upper	Primary	Secondary	
Aluminum (ug/L)	1.9	5.7	17.4	4.0	8.0	1,000	200	273
Arsenic (ug/L)	0.25	0.47	0.85	0.37	0.58	10	NE	270
Barium (ug/L)	86.8	118	161.5	112	125	1,000	NE	273
Boron (ug/L)	86.2	172	342	148	199	NE	NE	187
Cadmium (ug/L)	---	<1	---	---	---	5	NE	273
Chloride (mg/L)	37.6	45.0	54.4	44.0	47.0	NE	250	277
Chromium, Total (ug/L)	2.1	3.5	5.8	3.0	4.1	50	NE	263
Copper (ug/L)	0.91	2.2	5.3	1.6	3.0	NE	1,000	273
Fluoride (mg/L)	0.07	0.11	0.18	0.11	0.12	2	NE	267
Iron (ug/L)	4.5	16.0	56.6	10.8	23.5	NE	300	273
Lead (ug/L)	0.25	0.49	0.93	0.39	0.61	NE	NE	257
Manganese (ug/L)	0.51	2.6	13.0	1.7	4.0	NE	50	273
Mercury (ug/L)	---	<1	---	---	---	2	NE	270
Nickel (ug/L)	---	<10	---	---	---	100	NE	273
Nitrate as NO3 (mg/L)	4.2	9.3	20.8	8.1	10.7	45	NE	288
Perchlorate (ug/L)	---	<4	---	---	---	6	NE	268
Selenium (ug/L)	0.71	1.3	2.3	1.0	1.6	50	NE	272
Silver (ug/L)	---	<10	---	---	---	NE	100	271
Sodium Adsorption Ratio	1.8	2.2	3.1	2.1	2.4	NE	NE	86
Specific Conductance (µS/cm)	578	665	825	642	690	NE	900	282
Sulfate (mg/L)	35.5	44.7	56.2	42.5	47.0	NE	250	277
Total Dissolved Solids (mg/L)	337	400	490	384	410	NE	500	273
Zinc (ug/L)	--	<50	--	--	--	NE	5,000	273

Notes:

1. The principal aquifer zone is represented by wells primarily drawing water from depths greater than 150 feet.
2. ug/L= micrograms per liter (parts per billion); mg/L = milligrams per liter (or parts per million); µS/cm = microSiemens per centimeter
3. The percentile is the value below which a certain percent of observations fall (e.g., the 50th percentile, or median, is the value below which half of the observations fall). For parameters with results reported at multiple reporting limits, the Maximum Likelihood Estimate (MLE) method is used.
   -- indicates the value was not computed since more than 80% of all results are non-detect. In these cases, the exact value of the median cannot be determined and the value shown represents the highest detection limit.
4. The lower and upper estimates of the population median are determined using a 95% confidence interval (alpha = 0.05).
5. Primary and secondary maximum contaminant levels (MCLs) are from the California Code of Regulations. Primary MCLs are health-based drinking water standards, while secondary MCLs are aesthetic-based standards. For secondary MCLs with a range, the lower, recommended threshold is shown. NE= Not Established
6. n represents the number of wells tested.

Table D-4 Summary of Organic Parameters Detected in the Santa Clara Plain Shallow Aquifer Zone[1] (2002-2011)

Parameter	Wells Tested	Percent of Wells Tested with Detection	Tests	Percent of Tests with Detection	Maximum Concentration (ug/L)	Primary MCL[2] (ug/L)
1,1,1-Trichloroethane	30	6.7%	137	18.2%	2.1	200
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	29	3.4%	132	0.8%	4.64	1,200
Bromochloroacetic Acid	1	100%	2	50.0%	1	NE
Bromoform (THM)	30	3.3%	137	0.7%	0.63	NE
Chloroform (THM)	30	3.3%	137	0.7%	0.6	NE
Di(2-Ethylhexyl)Phthalate	2	50.0%	6	16.7%	0.501	4
Di-N-Butylphthalate	1	100%	1	100%	2.489	NE

Notes:

1. The shallow aquifer zone is represented by wells primarily drawing water from depths less than 150 feet.
2. NE = not established

Table D-5 Summary of Organic Parameters Detected in the Santa Clara Plain Principal Aquifer Zone^2 (2002-2011)

Parameter	Wells Tested	Percent of Wells Tested with Detection	Tests	Percent of Tests with Detection	Maximum Concentration (ug/L)	Primary MCL (ug/L)
1,1,1-Trichloroethane	278	9.7%	1,881	11.9%	5.8	200
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	276	2.9%	1,719	1.0%	30	1,200
1,1,2-Trichloroethane	278	0.7%	1,882	0.1%	2.7	5
1,1-Dichloroethene	277	2.2%	1,875	1.9%	5.7	6
1,2,3-Trichlorobenzene	275	0.4%	1,655	0.1%	0.58	NE
1,2,3-Trichloropropane	255	0.4%	1,335	0.1%	1	NE
Acetone	13	7.7%	14	7.1%	5	NE
Bromodichloromethane (THM)	277	2.9%	1,674	0.5%	3.1	NE
Bromoform (THM)	277	4.3%	1,676	1.1%	9.85	NE
Chloroform (THM)	277	5.8%	1,676	1.6%	20	NE
Chloromethane	260	2.3%	1,158	0.5%	3.1	NE
DCPA (Total Di & Mono Acid Degradates)	180	1.1%	389	0.5%	2.7	NE
Di(2-Ethylhexyl)Phthalate	221	1.4%	710	0.4%	4.5	4
Dibromoacetic Acid (DBAA)	37	2.7%	52	1.9%	1	NE
Dibromochloromethane	277	4.0%	1,674	0.8%	4.2	NE
Dibromochloropropane (DBCP)	223	0.9%	700	0.3%	0.016	0.2
Dichlorodifluoromethane (Freon 12)	277	1.4%	1,668	0.3%	87	NE
Dichloromethane	277	1.1%	1,877	0.2%	1.1	5
Di-N-Butylphthalate	8	12.5%	14	7.1%	2.58	NE
Diquat	211	0.5%	581	0.2%	2.2	20
HAA5 - Haloacetic Acids (HAA5)	30	3.3%	44	2.3%	1	60
Isopropylbenzene	275	0.4%	1,644	0.1%	0.72	NE
Naphthalene	273	1.1%	1,593	0.2%	2	NE
Tert-Butyl Alcohol	143	0.7%	367	0.3%	5	NE
Tetrachloroethene	278	0.4%	1,877	0.3%	0.8	5
Toluene	278	2.2%	1,880	0.4%	4.7	150
Total Trihalomethanes	226	12.4%	1359	0.4%	20	80
Trichloroethene	3	33.3%	1878	0.1%	1.2	5
Trichlorofluoromethane (Freon 11)	278	0.4%	1864	0.1%	5	150

Notes: 1. The principal aquifer zone is represented by wells primarily drawing water from depths greater than 150 feet. 2. NE = not established

Coyote Valley

Coyote Valley Hydrogeology

The Coyote Valley is the southern extension of the Santa Clara Valley Groundwater Basin, covering a surface area of 17 square miles. The Coyote Valley is approximately 7 miles long, and ranges from 3 miles wide to about a half mile wide at the boundary with the Santa Clara Plain to the north. The alluvial sediments overlying the Santa Clara Formation vary in thickness from a few feet or less along the west side of the subbasin to more than 400 feet along the east side[14]. The alluvial sediments are mainly composed of a thick alluvial sand and gravel with inter-bedded thin and discontinuous clays. A generalized cross-section of the Coyote Valley is presented in Figure D-6.

The Coyote Valley is generally unconfined and groundwater is typically encountered between 5 and 40 feet below ground surface. Groundwater movement generally follows surface water patterns, flowing to the northwest and draining into the Santa Clara Plain. Regional groundwater elevations in the subbasin range from 200 to 220 feet near the Coyote Narrows to about 350 feet at Cochrane Road in Morgan Hill.

Groundwater levels in the Coyote Valley respond rapidly to changes in hydrology and pumping. Local groundwater moves toward areas of intense pumping, especially at the southeastern and northern parts of the subbasin where retailer groundwater production wells are located. Groundwater recharge occurs along Coyote Creek due to the District managed recharge releases from Anderson Reservoir and stream seepage. The District does not have off-stream managed groundwater recharge facilities in the Coyote Valley.

Coyote Valley Storage Capacity

The operational storage capacity of the Coyote Valley has previously been estimated to range between 23,000 and 33,000 AF[15]. The District is currently working to refine the operational storage capacity estimate based on historically observed data.

Coyote Valley Water Budget

A water budget for average Coyote Valley inflows and outflows for calendar years 2002 to 2011 is presented in Table D-6. The Coyote Valley is almost entirely dependent on Coyote Creek for its water supply, which is largely fed by releases from the Anderson-Coyote reservoir system. Imported water from the San Felipe Project can also be released to Coyote Creek. Although this area is less urbanized than the Santa Clara Plain, recharge of direct precipitation is small compared to District managed recharge and natural recharge along Fisher Creek. Natural recharge from rainfall and other sources typically account for less than 25% of the inflows to the Coyote Valley. Over the 10 year period evaluated, the Coyote Valley has seen a slight annual decrease in storage.

Coyote Valley Groundwater Elevation Trends

Groundwater elevations are affected by natural and managed recharge and groundwater extraction and are an indicator of how much groundwater is in storage at a particular time. Groundwater elevations have been relatively stable since about 1970, although there has been a slight decreasing trend since the late 1990's. A typical hydrograph is shown below in Figure D-7.

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[14] McCloskey, T.F. and Finnemore, E.J., Estimating Hydraulic Conductivities in an Alluvial Basin from Sediment Facies Models, Groundwater Vol. 34, No. 6, November-December 1995.

[15] Santa Clara Valley Water District, Operational Storage Capacity of the Coyote and Llagas Groundwater Subbasins, April 2002.

Figure D-6 Coyote Valley Generalized Cross Section

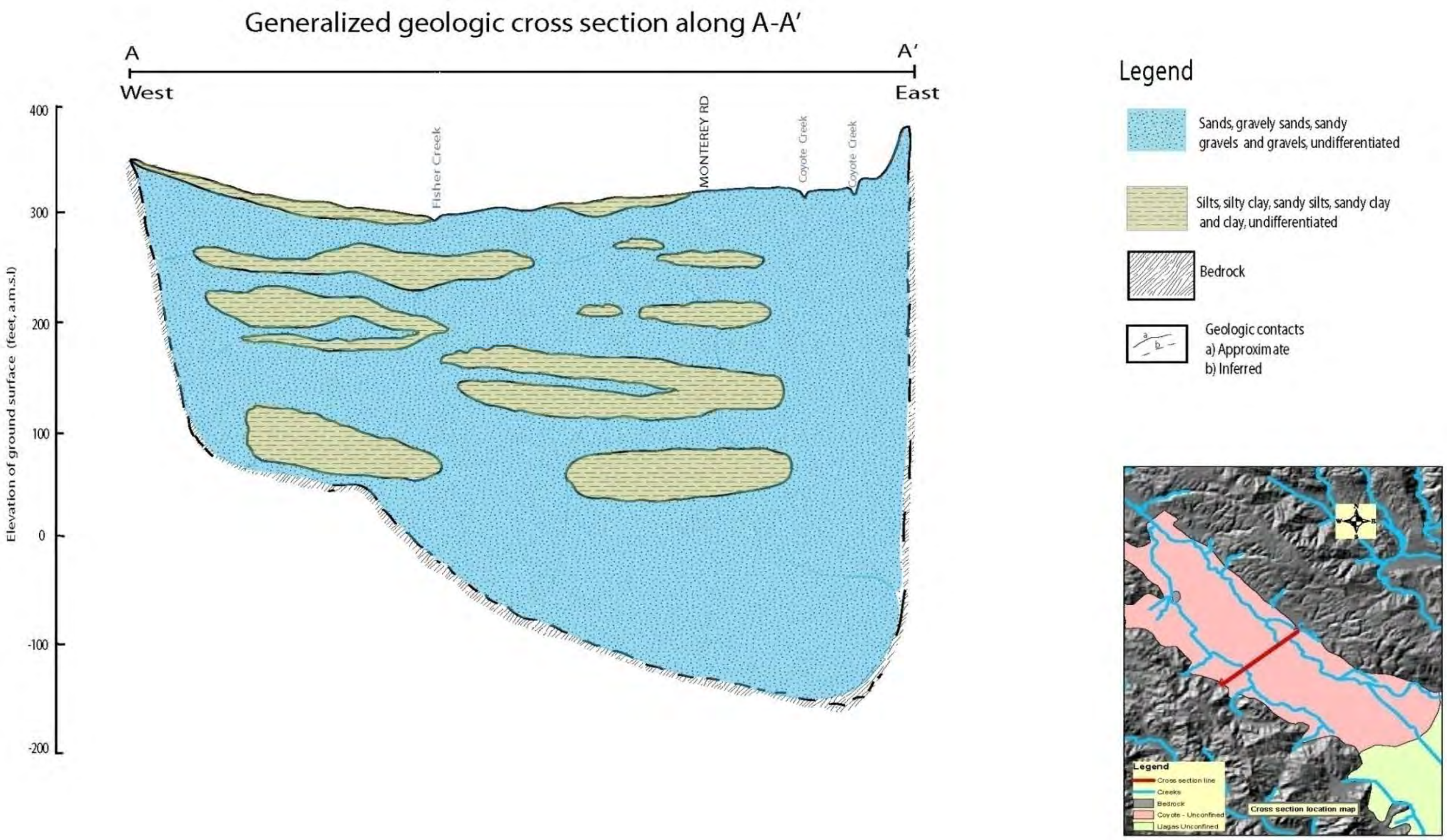


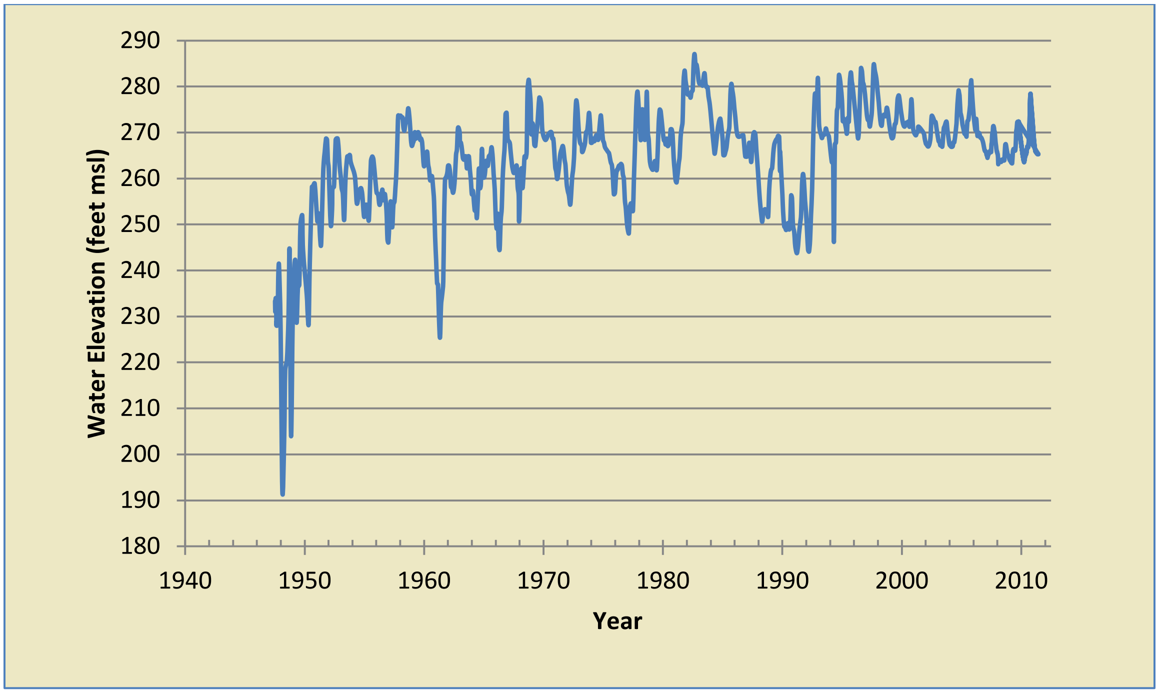
Table D-6 Coyote Valley Water Budget (2002 to 2011)

Water Budget Component	Acre-Feet
Inflow	
Managed Recharge	12,000
Natural Recharge	2,500
Subsurface Inflow	0
Total Inflow	14,500
Outflow	
Groundwater Pumping	10,000
Subsurface Outflow	5,000
Total Outflow	15,000
Change in Storage	-500

Notes:

1. Managed recharge represents direct replenishment by the District using local and imported water.
2. Natural recharge includes all uncontrolled recharge, including the deep percolation of rainfall, septic system and/or irrigation return flows, and natural seepage through creeks.
3. Subsurface inflow represents inflow from adjacent aquifer systems.
4. Groundwater pumping is based on pumping reported by water supply well owners.
5. Subsurface outflow represents outflow to adjacent aquifer systems, including outflow to the Santa Clara Plain.

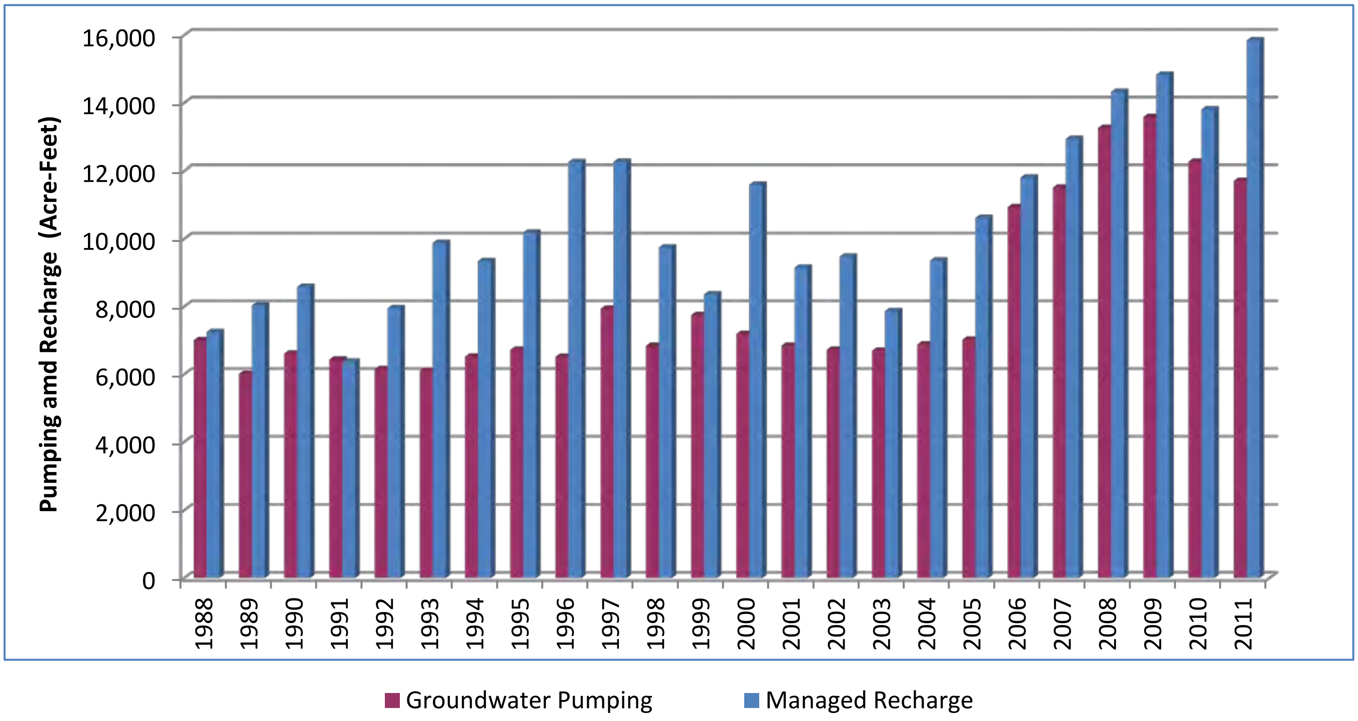
Figure D-7 Groundwater Elevation in Coyote Valley Well 09S02E02J002



Coyote Valley Groundwater Pumping Trends

As shown in Figure D-4, most of the high production wells (500 to 4,000 AF) are in the southern portion of Coyote Valley. Annual groundwater pumping for the Coyote Valley is shown in Figure D-8. The District assumed management of the Coyote Valley and Llagas Subbasin in 1987; prior to that date, limited groundwater pumping data are available. Coyote Valley groundwater pumping remained fairly consistent until 2006, when new water retailer wells began extracting water from Coyote Valley to serve customers in other areas. Managed recharge provides the majority of water available for groundwater production, as shown in Table D-6 and Figure D-8. Managed recharge in the Coyote Valley supports the maintenance of subsurface flows to the Santa Clara Plain, as they are both part of the Santa Clara Subbasin.

Figure D-8 Coyote Valley Groundwater Pumping and Managed Recharge



Coyote Valley Groundwater Quality

The Coyote Valley generally produces water of good quality for municipal, irrigation, and domestic supply. The typical water type is dominated by calcium-magnesium and bicarbonate. The median TDS concentration is 368 mg/L, which is below the CDPH recommended secondary maximum contaminant level of 500 mg/L. The median nitrate concentration is 15 mg/L, below the MCL of 45 mg/L. Typically, very few wells sampled each year contain contaminants above primary maximum contaminant levels (MCL)[16]. A summary of Coyote Valley water quality data is presented in Table D-7. Table D-8 summarizes the detections of organic water quality parameters in the Coyote Valley.

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[16] Santa Clara Valley Water District, 2010 Groundwater Quality Report, June 2011.

Table D-7 Coyote Valley Groundwater Quality Summary Statistics

Parameter[1]	2002 - 2011 Results[2]			Population Median[3]		MCL[4]		n[5]
	25th Percentile	50th Percentile (Median)	75th Percentile	Lower	Upper	Primary	Secondary	
Aluminum (ug/L)	0.52	2.6	13.3	0.23	29.7	1,000	200	130
Arsenic (ug/L)	---	<2	---	---	---	10	NE	34
Barium (ug/L)	<100	79.1	115	<100	100	1,000	NE	34
Boron (ug/L)	18.6	53.7	155.2	27.0	106.7	NE	NE	27
Cadmium (ug/L)	---	<1	---	---	---	5	NE	34
Chloride (mg/L)	32.3	37.0	43.8	34.0	40.0	NE	250	33
Chromium, Total	0.94	1.8	3.4	0.88	3.6	50	NE	113
Copper (ug/L)	---	<50	---	---	---	NE	1,000	34
Fluoride (mg/L)	0.11	0.14	0.17	0.13	0.16	2	NE	35
Iron (ug/L)	2.7	12.6	57.7	3.0	52.1	NE	300	121
Lead (ug/L)	---	<5	---	---	---	NE	NE	34
Manganese (ug/L)	0.15	1.1	8.4	0.08	15.9	NE	50	33
Mercury (ug/L)	---	<1	---	---	---	2	NE	34
Nickel (ug/L)	---	<10	---	---	---	100	NE	
Nitrate as NO3 (mg/L)	3.7	15.0	43.0	4.5	29.8	45	NE	39
Perchlorate (ug/L)	---	<4	---	---	---	6	NE	33
Selenium (ug/L)	---	<5	---	---	---	50	NE	34
Silver (ug/L)	---	<10	---	---	---	NE	100	34
Specific Conductance (µS/cm)	552	614	654	565	630	NE	900	38
Sulfate (mg/L)	33.5	38.2	52.0	35.0	50.1	NE	250	31
Total Dissolved Solids (mg/L)	320	368	414	328	405	NE	500	29
Zinc (ug/L)	0.40	2.7	18.8	0.30	25.1	NE	5,000	34

Notes:

1. ug/L= micrograms per liter (parts per billion); mg/L = milligrams per liter (or parts per million); µS/cm = microSiemens per centimeter
2. The percentile is the value below which a certain percent of observations fall (e.g., the 50th percentile, or median, is the value below which half of the observations fall). For parameters with results reported at multiple reporting limits, the Maximum Likelihood Estimate (MLE) method is used.
   -- indicates the value was not computed since more than 80% of all results are non-detect. In these cases, the exact value of the median cannot be determined and the value shown represents the highest detection limit.
3. The lower and upper estimates of the population median are determined using a 95% confidence interval (alpha = 0.05).
4. Primary and secondary maximum contaminant levels (MCLs) are from the California Code of Regulations. Primary MCLs are health-based drinking water standards, while secondary MCLs are aesthetic-based standards. For secondary MCLs with a range, the lower, recommended threshold is shown. NE= Not Established
5. n represents the number of wells tested.

Table D-8 Summary of Organic Parameters Detected in the Coyote Valley (2002 to 2011)

Parameter	Wells Tested	Percent of Wells Tested with Detection	Tests	Percent of Tests with Detection	Maximum Concentration (ug/L)	Primary MCL (ug/L)
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	33	3.0%	126	2.4%	4.4	1,200
Acetone	4	50.0%	4	50.0%	6.3	5
Atrazine	18	5.6%	68	1.5%	1	1
Bromoform (THM)	33	3.0%	122	0.8%	0.81	NE
Chloroform (THM)	33	6.1%	122	1.6%	5.3	NE
Dichloromethane	33	3.0%	129	1.6%	2.3	5
Toluene	33	3.0%	128	0.8%	0.56	150
Total Trihalomethanes	19	15.8%	60	6.7%	6	80
Xylenes (Total)	33	3.0%	127	0.8%	0.82	1,750

Notes: NE = not established.

Llagas Subbasin

Llagas Subbasin Hydrogeology

The Llagas Subbasin is part of the Gilroy-Hollister Valley Groundwater Basin (DWR Basin Number 3-3) and covers a surface area of approximately 88 square miles. The Llagas Subbasin is about 15 miles long in the northwest/southeast direction and 3 to 6 miles wide.

The Llagas Subbasin is comprised of alluvial sediments ranging in thickness from about 500 feet at the apex at the northern divide to over 1,000 feet thick beneath the Pajaro River[17]. The subbasin consists of a number of discontinuous layers of gravel, sand and rock fragments (aquifer materials) and clay and silt (aquitards) at various depths beneath the ground surface. Water-bearing sediments occur in discontinuous and heterogeneous lenses that do not form well-defined laterally continuous layers.

The recharge area is located at the north, western, and eastern edges of the subbasin and is the area where active groundwater recharge takes place. Toward the south end of the subbasin, confining layers become more frequent and laterally and vertically extensive. Thus in the vicinity of the Pajaro River, the aquifer system is mostly confined[18]. This low permeability zone ranges in thickness from about 40 to 100 feet, and is most commonly encountered between 20 and 100 feet below ground surface[22]. Within the confined area, low permeability units restrict the vertical flow of groundwater and divide the subbasin into shallow and principal aquifer zones. The boundary between the recharge and confined areas was originally defined on the basis of flowing artesian wells[19]. The boundary is gradual and broad, and not as precise as its depiction on maps and figures implies. A generalized cross-section is presented in Figure D-9.

Groundwater movement generally follows surface water patterns, draining south toward the Pajaro River in San Benito County. Locally, groundwater also moves toward areas of intense pumping. Groundwater levels are influenced by the District's managed recharge activities in the recharge area. Vertical gradients are predominately downward, although several monitoring wells at the southern end of the subbasin are flowing artesian. Historic marshes located east of Gilroy and south of Pacheco Highway indicate an area of upward flow and groundwater discharge.

Llagas Subbasin Storage Capacity

The operational storage capacity of the Llagas Subbasin has previously been estimated to range between 152,000 and 165,000 AF[20]. The District is currently working to refine the operational storage capacity estimate based on historically observed data.

Llagas Subbasin Water Budget

A water budget for the Llagas Subbasin for calendar years 2002 to 2011 is presented in Table D-9. Although some variability can be observed from year to year due to changes in groundwater pumping and recharge, on average, there was a slight annual decrease in storage for the Llagas Subbasin over this time period.

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[17] Santa Clara Valley Water District, Standards for the Construction and Destruction of Wells and other Deep Excavations in Santa Clara County, June 1989.

[18] Todd Engineers/Kennedy Jenks Consultants for Santa Clara Valley Water District, Revised Final Groundwater Vulnerability Study, Santa Clara County, California, October 2010.

[19] USGS, Ground water in Santa Clara Valley, California, Water-Supply Paper 519, 1924.

[20] Santa Clara Valley Water District, Operational Storage Capacity of the Coyote and Llagas Groundwater Subbasins, April 2002.

Figure D-9 Llagas Subbasin Generalized Cross Section

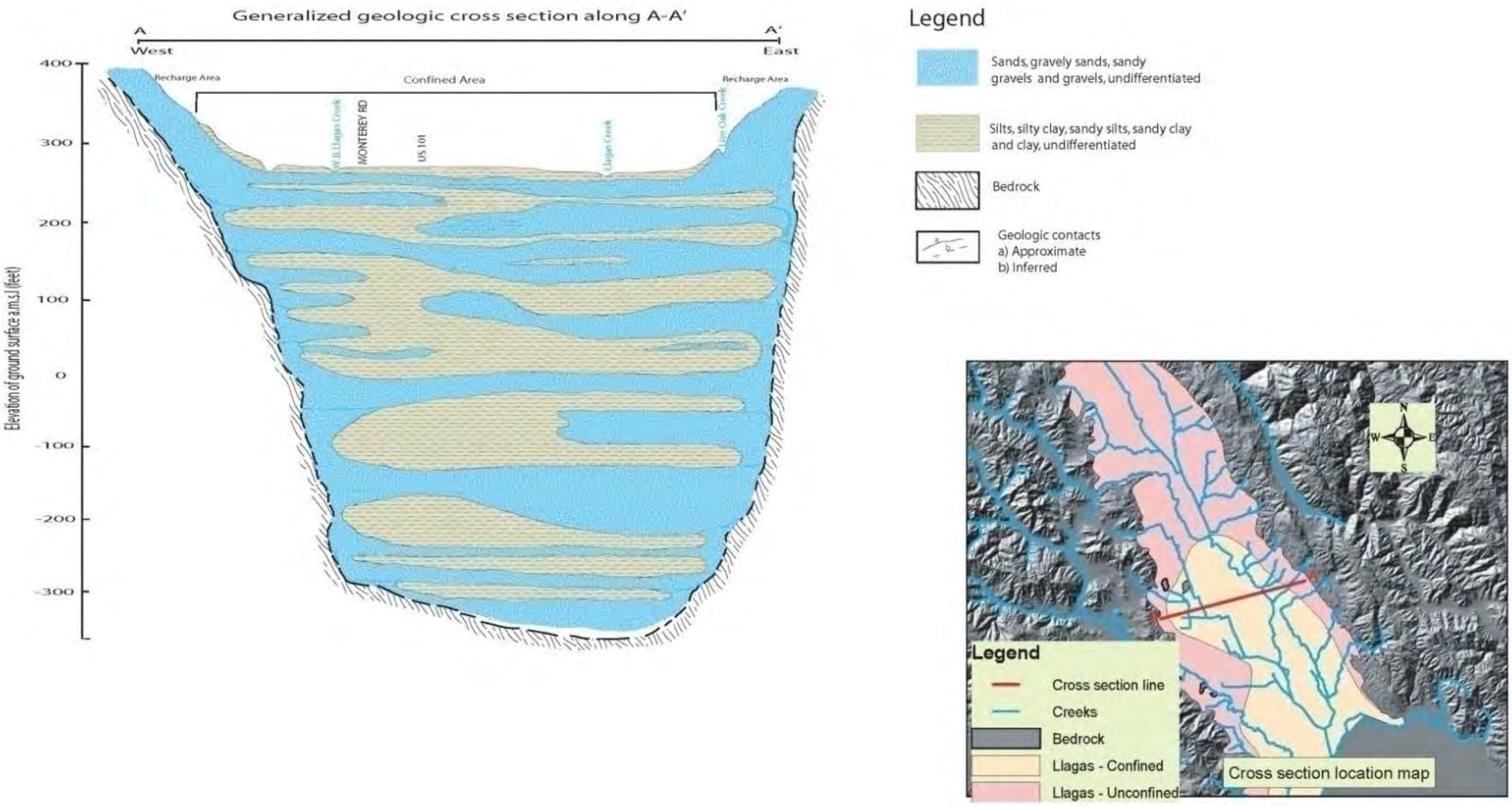


Table D-9 Llagas Subbasin Principal Aquifer Water Budget (2002 to 2011)

Water Budget Component	Acre-Feet
Inflow	
Managed Recharge	24,000
Natural Recharge	21,500
Subsurface Inflow	1,000
Total Inflow	46,500
Outflow	
Groundwater Pumping	44,000
Subsurface Outflow	2,500
Total Outflow	46,500
Change in Storage	0

Notes:

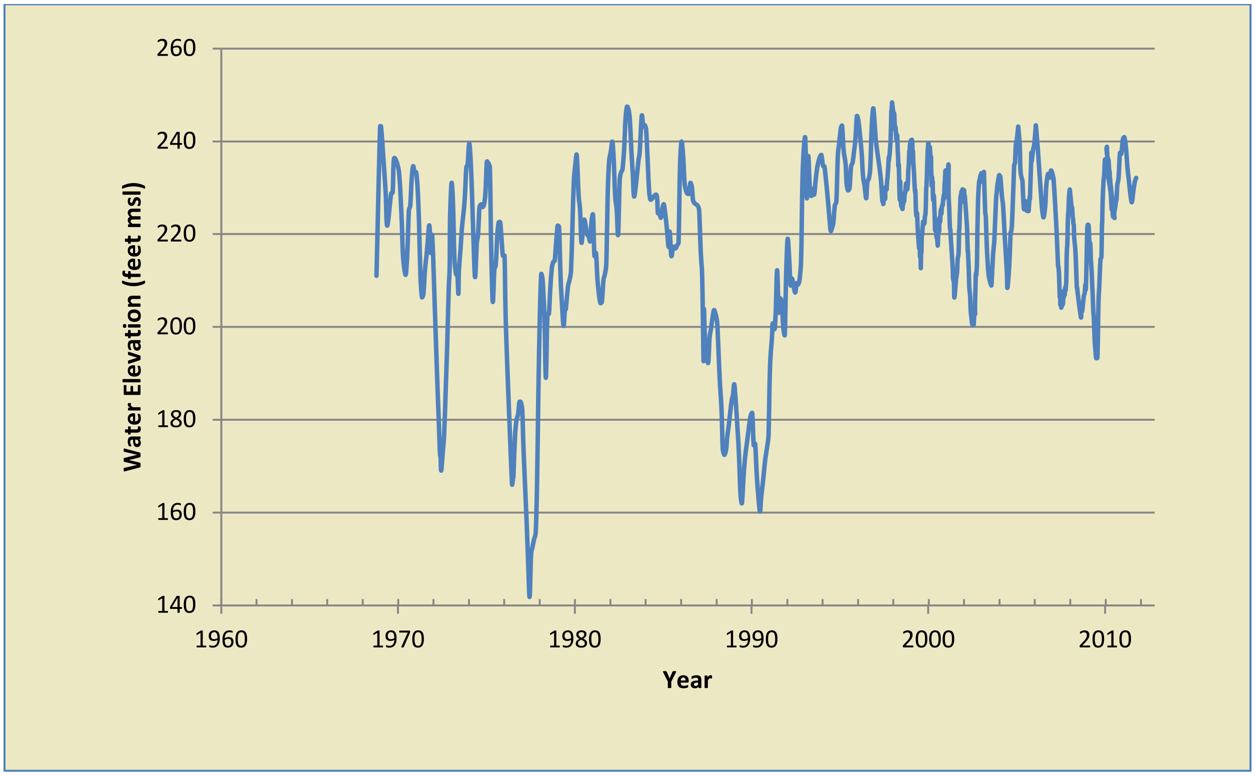
1. Managed recharge represents direct replenishment by the District using local and imported water.
2. Natural recharge includes all uncontrolled recharge, including the deep percolation of rainfall, septic system and/or irrigation return flows, and natural seepage through creeks.
3. Subsurface inflow represents inflow from adjacent aquifer systems, including inflow from the Bolsa Subbasin in San Benito County.
4. Groundwater pumping is based on pumping reported by water supply well owners.
5. Subsurface outflow represents outflow to adjacent aquifer systems, including outflow to the Bolsa Subbasin in San Benito County.

This budget is based on the District groundwater flow model for the Llagas Subbasin and represents general subbasin inflows and outflows. Managed recharge occurs through the Upper and Lower Llagas recharge systems and from water released from Anderson Reservoir. Approximately half of the inflows to the Llagas Subbasin are from managed recharge, while the other half are from natural recharge.

Llagas Subbasin Groundwater Elevation Trends

A typical hydrograph for the Llagas Subbasin is shown in Figure D-10, with water levels fluctuating about 10 to 30 feet on seasonal basis. The droughts of 1976-77 and the late 1980 to early 1990s are seen from the hydrograph of this well.

Figure D-10 Groundwater Elevation in Llagas Subbasin Well 10S03E13D003

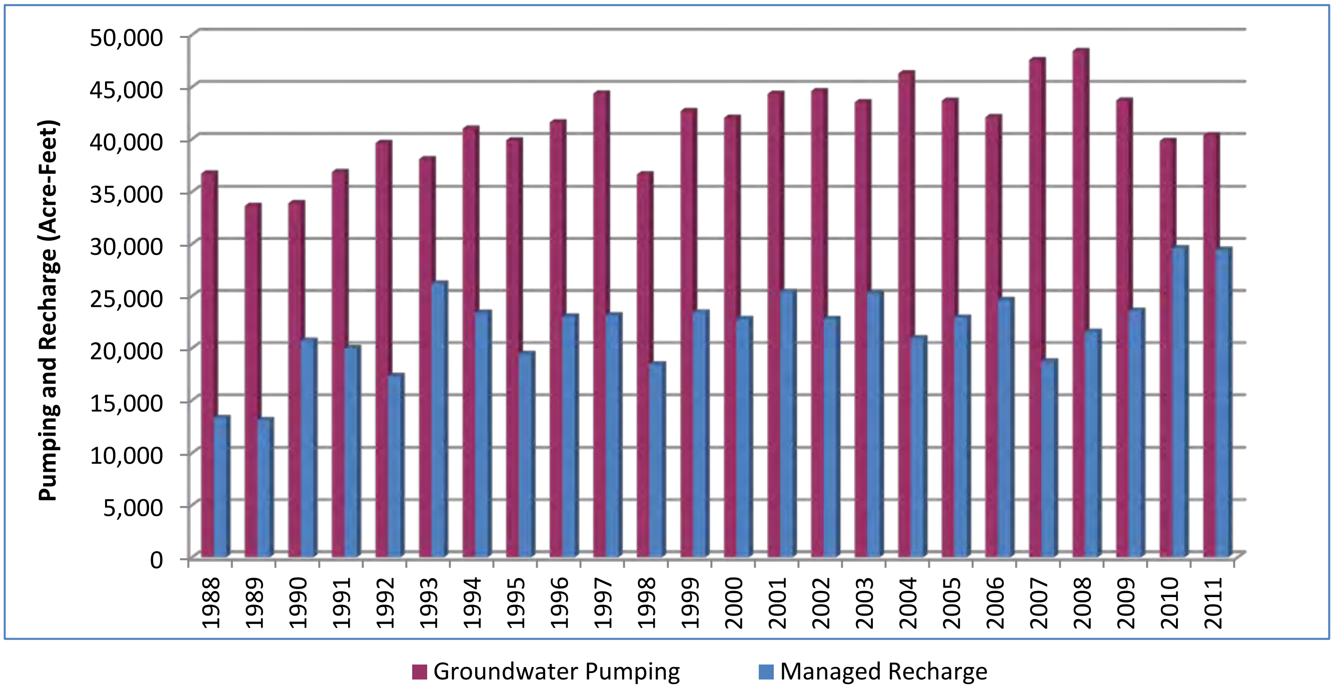


Llagas Subbasin Groundwater Pumping Trends

Figure D-4 indicates that for 2010, most high production wells (500 to 4,000 AF) are in the northern and southern portions of the Llagas Subbasin. The Llagas Subbasin contains more water supply wells than the Santa Clara Subbasin, but the majority of these produce modest amounts of water (<100 AF) typical of domestic and small agricultural use in this mostly rural area of the county.

The District assumed management of the Llagas Subbasin in 1987; prior to that date, only limited groundwater pumping data are available. Figure D-11 shows annual pumping from 1988 through 2011 in the Llagas Subbasin, indicating fairly consistent pumping over time. The increase in urban water demand has coincided with decreases in agricultural water demand as land use is converted. Managed recharge provides much of the water available for groundwater pumping, as shown in Table D-9 and Figure D-11.

Figure D-11 Llagas Subbasin Groundwater Pumping and Managed Recharge



Llagas Subbasin Groundwater Quality

The Llagas Subbasin generally produces water of good quality for municipal, irrigation, and domestic uses. Calcium and magnesium constitute the principal cations and bicarbonate is the principal anion. The median TDS concentration in the principal aquifer zone is 350 mg/L, well below the recommended CDPH secondary MCL of 500 mg/L. Some shallow aquifers located in the southern regions of the Llagas Subbasin produce water with higher TDS (up to 1,000 mg/L). Tables D-10 and D-11 present a summary of inorganic water quality in the Llagas Subbasin, while Tables D-12 and D-13 present a summary of detections of organic parameters.

Compared to the Santa Clara Subbasin, there are typically more detections of parameters above the MCL in the Llagas Subbasin, primarily nitrate and perchlorate[21]. Nitrate is an ongoing concern in the Llagas Subbasin due to historic and ongoing sources, including synthetic fertilizers, septic systems, and animal waste. Between 2002 and 2011, nitrate was detected above the MCL of 45 mg/L in at least one sample for 33% of the 143 wells tested as part of the District's regional groundwater monitoring program. However, trend analyses for the same time period show 20% of principal zone wells exhibiting a decreasing trend in nitrate concentrations with 5% showing a increasing trend.

In 2003, perchlorate was discovered over a wide area of the Llagas Subbasin due to releases from the Olin facility in Morgan Hill. In July 2011, there were only 8 domestic wells with perchlorate above the MCL of 6 μg/L compared to 188 wells in 2004. The median perchlorate concentration for the principal aquifer zone is 2.2 to 3.2 μg/L. The characterization and clean up of perchlorate is being conducted by the Olin Corporation under a Clean-up and Abatement Order from the Central Coast Water Board and the District continues to advocate for the timely restoration of groundwater.

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[21] Santa Clara Valley Water District, 2010 Groundwater Quality Report, June 2011.

Table D-10 Llagas Subbasin Shallow Aquifer Zone[1] Groundwater Quality Statistics

Parameter[2]	2002 - 2011 Results[3]			Population Median[4]		MCL[5]		n[6]
	25th Percentile	50th Percentile (Median)	75th Percentile	Lower	Upper	Primary	Secondary	
Aluminum (ug/L)	5.9	11.0	20.5	5.8	20.8	1,000	200	33
Arsenic (ug/L)	---	<2	---	---	---	10	NE	33
Barium (ug/L)	---	<2	---	---	---	1,000	NE	33
Boron (ug/L)	66.0	112	189	84.8	147	NE	NE	33
Cadmium (ug/L)	---	<1	---	---	---	5	NE	33
Chloride (mg/L)	23.7	42.4	76.1	31.8	56.6	NE	250	35
Chromium, Total (ug/L)	---	<10	---	---	---	50	NE	33
Copper (ug/L)	---	<50	---	---	---	NE	1,000	33
Fluoride (mg/L)	0.11	0.13	0.16	0.12	0.14	2	NE	33
Iron (ug/L)	1.8	5.6	17.4	1.9	16.2	NE	300	33
Lead (ug/L)	---	<5	---	---	---	NE	NE	33
Manganese (ug/L)	0.26	1.4	7.4	0.21	9.2	NE	50	33
Mercury (ug/L)		<1				2	NE	29
Nickel (ug/L)	0.39	1.3	4.5	0.34	5.1	100	NE	33
Nitrate as NO3 (mg/L)	4.9	19.9	80.2	10.1	38.9	45	NE	37
Perchlorate (ug/L)	---	<4	---	---	---	6	NE	36
Selenium (ug/L)	---	<5	---	---	---	50	NE	33
Silver (ug/L)	---	<10	---	---	---	NE	100	33
Specific Conductance (µS/cm)	543	743	984	639	913	NE	900	37
Sulfate (mg/L)	32.9	54.9	73.05	39.1	61.8	NE	250	33
Total Dissolved Solids (mg/L)	319.5	480	604	402	564	NE	500	31
Zinc (ug/L)	---	<50	---	---	---	NE	5,000	33

Notes:

1. The shallow aquifer zone is represented by wells primarily drawing water from depths less than 150 feet.
2. ug/L= micrograms per liter (parts per billion); mg/L = milligrams per liter (or parts per million); µS/cm = microSiemens per centimeter
3. The percentile is the value below which a certain percent of observations fall (e.g., the 50th percentile, or median, is the value below which half of the observations fall). For parameters with results reported at multiple reporting limits, the Maximum Likelihood Estimate (MLE) method is used.
   -- indicates the value was not computed since more than 80% of all results are non-detect. In these cases, the exact value of the median cannot be determined and the value shown represents the highest detection limit.
4. The lower and upper estimates of the population median are determined using a 95% confidence interval (alpha = 0.05).
5. Primary and secondary maximum contaminant levels (MCLs) are from the California Code of Regulations. Primary MCLs are health-based drinking water standards, while secondary MCLs are aesthetic-based standards. For secondary MCLs with a range, the lower, recommended threshold is shown. NE= Not Established
6. n represents the number of wells tested.

Table D-11 Llagas Subbasin Principal Aquifer Zone[1] Groundwater Quality Statistics

Parameter[2]	2002 - 2011 Results[3]			Population Median[4]		MCL[5]		n[6]
	25th Percentile	50th Percentile (Median)	75th Percentile	Lower	Upper	Primary	Secondary	
Aluminum (ug/L)	---	<50	---	---	---	1,000	200	97
Arsenic (ug/L)	---	<2	---	---	---	10	NE	94
Barium (ug/L)	52.0	86.2	143	72.7	102	1,000	NE	93
Boron (ug/L)	59.6	97.9	161	82.3	116	NE	NE	82
Cadmium (ug/L)	---	<1	---	---	---	5	NE	96
Chloride (mg/L)	27.0	41.5	61.3	35.0	48.5	NE	250	102
Chromium, Total (ug/L)	0.14	0.40	1.2	0.08	2.1	50	NE	96
Copper (ug/L)	---	<50	---	---	---	NE	1,000	93
Fluoride (mg/L)	0.11	0.13	0.17	0.13	0.14	2	NE	98
Iron (ug/L)	6.3	19.1	58.5	10.7	34.1	NE	300	94
Lead (ug/L)	---	<5	---	---	---	NE	NE	96
Manganese (ug/L)	---	<20	---	---	---	NE	50	93
Mercury (ug/L)	---	<1	---	---	---	2	NE	93
Nickel (ug/L)	---	<10	---	---	---	100	NE	96
Nitrate as NO3 (mg/L)	9.8	22.4	51.2	18.3	27.4	45	NE	143
Perchlorate (ug/L)	1.8	2.7	4.1	2.3	3.2	6	NE	175
Selenium (ug/L)	---	<10	---	---	---	50	NE	96
Silver (ug/L)	---	<10	---	---	---	NE	100	93
Sodium	19.6	26.0	41.6	24.0	30.0	NE	NE	102
Specific Conductance (µS/cm)	530	577.5	740	560	610	NE	900	107
Sulfate (mg/L)	27.6	33.9	42	31.9	38	NE	250	92
Total Dissolved Solids (mg/L)	320	350	435	339	382	NE	500	102
Zinc (ug/L)	5.3	12.3	28.5	7.8	19.3	NE	5,000	94

Notes:

1. The principal aquifer zone is represented by wells primarily drawing water from depths greater than 150 feet.
2. ug/L= micrograms per liter (parts per billion); mg/L = milligrams per liter (or parts per million); µS/cm = microSiemens per centimeter
3. The percentile is the value below which a certain percent of observations fall (e.g., the 50th percentile, or median, is the value below which half of the observations fall). For parameters with results reported at multiple reporting limits, the Maximum Likelihood Estimate (MLE) method is used.
   -- indicates the value was not computed since more than 80% of all results are non-detect. In these cases, the exact value of the median cannot be determined and the value shown represents the highest detection limit.
4. The lower and upper estimates of the population median are determined using a 95% confidence interval (alpha = 0.05).
5. Primary and secondary MCLs are from the California Code of Regulations. Primary MCLs are health-based drinking water standards, while secondary MCLs are aesthetic-based standards. For secondary MCLs with a range, the lower, recommended threshold is shown. NE= Not Established
6. n represents the number of wells tested.

Table D-12 Summary of Organic Parameters Detected in the Llagas Subbasin Shallow Aquifer Zone[1]

Parameter	Wells Tested	Percent of Wells Tested with Detection	Tests	Percent of Tests with Detection	Maximum Concentration (ug/L)	Primary MCL[2] (ug/L)
1,1,1-Trichloroethane	33	3.0%	124	1.6%	0.8	200
Bromodichloromethane (THM)	33	3.0%	137	0.7%	2	NE
Chloroform (THM)	33	12.1%	137	6.6%	26	NE
Methyl-Tert-Butyl-Ether (MTBE)	33	3.0%	125	0.8%	0.7	13
Naphthalene	33	3.0%	124	0.8%	0.88	NE
Total Trihalomethanes	9	33.3%	14	28.6%	4	80

Table D-13 Summary of Organic Parameters Detected in the Llagas Subbasin Principal Aquifer Zone[3]

Parameter	Wells Tested	Percent of Wells Tested with Detection	Tests	Percent of Tests with Detection	Maximum Concentration (ug/L)	Primary MCL[2] (ug/L)
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	96	2.1%	527	0.6%	3.854	1,200
Bromodichloromethane (THM)	98	1.0%	528	0.2%	2.2	NE
Bromoform (THM)	98	4.1%	530	1.3%	3.6	NE
Chloroform (THM)	98	2.0%	530	0.4%	1	NE
Dibromochloromethane (THM)	98	3.1%	529	0.6%	3.3	NE
Dichlorodifluoromethane (Freon 12)	98	2.0%	542	5.4%	0.98	NE
Methyl-Tert-Butyl-Ether (MTBE)	99	1.0%	726	0.1%	4.5	13
Tetrachloroethylene	98	3.1%	537	23.1%	4.2	5
Total Trihalomethanes	49	12.2%	261	3.1%	9.7	80
Trichloroethylene	98	1.0%	540	0.6%	21	5

Notes:

1. The shallow aquifer zone is represented by wells primarily drawing water from depths less than 150 feet.
2. NE = not established
3. The principal aquifer zone is represented by wells primarily drawing water from depths greater than 150 feet.

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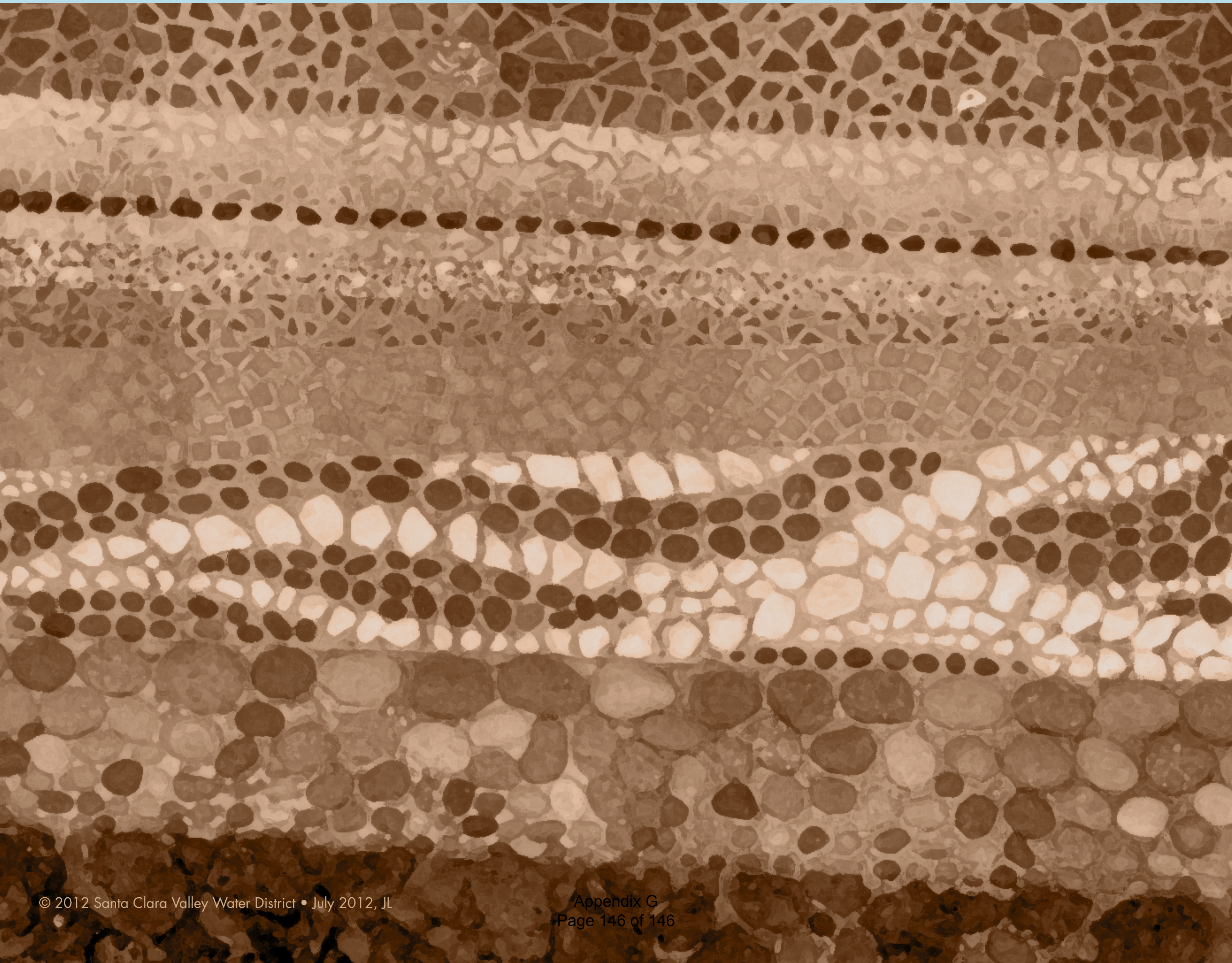
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686
Phone: (408) 265-2600
www.valleywater.org



Modeling Assumptions

	Scenario 1: 2020 Demands, 2015 UWMP	Scenario 2: 2025 Demands, 2015 UWMP	Scenario 3: 2030 Demands, 2015 UWMP	Scenario 4: 2035 Demands, 2015 UWMP	Scenario 5: 2040 Demands, 2015 UWMP
1 General					
Historical Hydrology	1922-2015	1922-2015	1922-2015	1922-2015	1922-2015
Demand Year	2020	2025	2030	2035	2040
Model Version	Water Evaluation And Planning model (WEAP), Version: 2015.0012 Dictionary Version: 361	Water Evaluation And Planning model (WEAP), Version: 2015.0012 Dictionary Version: 361	Water Evaluation And Planning model (WEAP), Version: 2015.0012 Dictionary Version: 361	Water Evaluation And Planning model (WEAP), Version: 2015.0012 Dictionary Version: 361	Water Evaluation And Planning model (WEAP), Version: 2015.0012 Dictionary Version: 361
Model Name	Master WEAP Model February 2016 v010	Master WEAP Model February 2016 v010	Master WEAP Model February 2016 v010	Master WEAP Model February 2016 v010	Master WEAP Model February 2016 v010
Elements modeled	Complete water supply system	Complete water supply system	Complete water supply system	Complete water supply system	Complete water supply system
General Scenario Description	Planned water supply facilities and operations for 2020	Planned water supply facilities and operations for 2025	Planned water supply facilities and operations for 2030	Planned water supply facilities and operations for 2035	Planned water supply facilities and operations for 2035
Model Method	Deterministic	Deterministic	Deterministic	Deterministic	Deterministic
2 Surface Water Supplies					
CVP Supplies to Coyote Creek	Downstream recharge requirement less 2 cfs min Anderson release if combined (Anderson and Coyote) storage is less than: Nov: 42.0 TAF Dec: 46.1 TAF Jan: 71.3 TAF Feb: 74.8 TAF Mar: 87.6 TAF Apr: 87.6 TAF May - Oct: 0 cfs	Downstream recharge requirement less 2 cfs min Anderson release if combined (Anderson and Coyote) storage is less than: Nov: 42.0 TAF Dec: 46.1 TAF Jan: 71.3 TAF Feb: 74.8 TAF Mar: 87.6 TAF Apr: 87.6 TAF May - Oct: 0 cfs	Downstream recharge requirement less 2 cfs min Anderson release if combined (Anderson and Coyote) storage is less than: Nov: 42.0 TAF Dec: 46.1 TAF Jan: 71.3 TAF Feb: 74.8 TAF Mar: 87.6 TAF Apr: 87.6 TAF May - Oct: 0 cfs	Downstream recharge requirement less 2 cfs min Anderson release if combined (Anderson and Coyote) storage is less than: Nov: 42.0 TAF Dec: 46.1 TAF Jan: 71.3 TAF Feb: 74.8 TAF Mar: 87.6 TAF Apr: 87.6 TAF May - Oct: 0 cfs	Downstream recharge requirement less 2 cfs min Anderson release if combined (Anderson and Coyote) storage is less than: Nov: 42.0 TAF Dec: 46.1 TAF Jan: 71.3 TAF Feb: 74.8 TAF Mar: 87.6 TAF Apr: 87.6 TAF May - Oct: 0 cfs
CVP supplies to Anderson Reservoir	Yes, if month is March or April and Anderson storage < 35,000 af; then move 100 cfs until storage reaches 35,000 af	Yes, if month is March or April and Anderson storage < 35,000 af; then move 100 cfs until storage reaches 35,000 af	Yes, if month is March or April and Anderson storage < 35,000 af; then move 100 cfs until storage reaches 35,000 af	Yes, if month is March or April and Anderson storage < 35,000 af; then move 100 cfs until storage reaches 35,000 af	Yes, if month is March or April and Anderson storage < 35,000 af; then move 100 cfs until storage reaches 35,000 af
CVP supplies priorities	1 - Minimum flows to Upper Coyote (9 cfs) and Llagas (7 cfs) 2 - Treatment Plants 3 - Remaining recharge in Upper Coyote and Llagas 4 - Other Coyote recharge 5 - Alamitos/Guadalupe and most other recharge 6 - Westside recharge	1 - Minimum flows to Upper Coyote (9 cfs) and Llagas (7 cfs) 2 - Treatment Plants 3 - Remaining recharge in Upper Coyote and Llagas 4 - Other Coyote recharge 5 - Alamitos/Guadalupe and most other recharge 6 - Westside recharge	1 - Minimum flows to Upper Coyote (9 cfs) and Llagas (7 cfs) 2 - Treatment Plants 3 - Remaining recharge in Upper Coyote and Llagas 4 - Other Coyote recharge 5 - Alamitos/Guadalupe and most other recharge 6 - Westside recharge	1 - Minimum flows to Upper Coyote (9 cfs) and Llagas (7 cfs) 2 - Treatment Plants 3 - Remaining recharge in Upper Coyote and Llagas 4 - Other Coyote recharge 5 - Alamitos/Guadalupe and most other recharge 6 - Westside recharge	1 - Minimum flows to Upper Coyote (9 cfs) and Llagas (7 cfs) 2 - Treatment Plants 3 - Remaining recharge in Upper Coyote and Llagas 4 - Other Coyote recharge 5 - Alamitos/Guadalupe and most other recharge 6 - Westside recharge
CVP Reallocation Agreement[3] (1997 - 25 year agreement)	Active	Inactive	Inactive	Inactive	Inactive
Imported Water Allocations	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.
Semitropic Participation	350,000 acre-foot (AF) capacity; initial storage = 200,000 AF	350,000 acre-foot (AF) capacity; initial storage = 200,000 AF	350,000 acre-foot (AF) capacity; initial storage = 200,000 AF	350,000 acre-foot (AF) capacity; initial storage = 200,000 AF	350,000 acre-foot (AF) capacity; initial storage = 200,000 AF
Semitropic Water Bank "Put"	If Semitropic banks is not very full (less than 100,000 af) then put to the bank before using carryover to swp and cvp; if SLR is near full, put to semitropic after 7,000 af carryover in swp and 10,700 af in cvp; else put to semitropic after 20,000 carryover in both swp and cvp	If Semitropic banks is not very full (less than 100,000 af) then put to the bank before using carryover to swp and cvp; if SLR is near full, put to semitropic after 7,000 af carryover in swp and 10,700 af in cvp; else put to semitropic after 20,000 carryover in both swp and cvp	If Semitropic banks is not very full (less than 100,000 af) then put to the bank before using carryover to swp and cvp; if SLR is near full, put to semitropic after 7,000 af carryover in swp and 10,700 af in cvp; else put to semitropic after 20,000 carryover in both swp and cvp	If Semitropic banks is not very full (less than 100,000 af) then put to the bank before using carryover to swp and cvp; if SLR is near full, put to semitropic after 7,000 af carryover in swp and 10,700 af in cvp; else put to semitropic after 20,000 carryover in both swp and cvp	If Semitropic banks is not very full (less than 100,000 af) then put to the bank before using carryover to swp and cvp; if SLR is near full, put to semitropic after 7,000 af carryover in swp and 10,700 af in cvp; else put to semitropic after 20,000 carryover in both swp and cvp
Semitropic Water Bank "Take"	If treated water contract demand is not met and/or groundwater storage falls below 300,000 AF; take increases as groundwater storage decreases	If treated water contract demand is not met and/or groundwater storage falls below 300,000 AF; take increases as groundwater storage decreases	If treated water contract demand is not met and/or groundwater storage falls below 300,000 AF; take increases as groundwater storage decreases	If treated water contract demand is not met and/or groundwater storage falls below 300,000 AF; take increases as groundwater storage decreases	If treated water contract demand is not met and/or groundwater storage falls below 300,000 AF; take increases as groundwater storage decreases
Semitropic Reoperations	Active	Active	Active	Active	Active
San Luis Reservoir	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.	2015 Draft Delivery Capability Report - Early Long-Term Scenario. Includes climate change, biological opinions, and Fall X2.
San Luis Low Point	CVP deliveries are restricted to 75% of allocation to Santa Teresa and Rinconada WTP when a low point event is active (San Luis storage < 250,000 af); however if expanded Anderson or Pacheco Reservoirs are active AND their storage is available for release, this restriction is not implemented.	CVP deliveries are restricted to 75% of allocation to Santa Teresa and Rinconada WTP when a low point event is active (San Luis storage < 250,000 af); however if expanded Anderson or Pacheco Reservoirs are active AND their storage is available for release, this restriction is not implemented.	CVP deliveries are restricted to 75% of allocation to Santa Teresa and Rinconada WTP when a low point event is active (San Luis storage < 250,000 af); however if expanded Anderson or Pacheco Reservoirs are active AND their storage is available for release, this restriction is not implemented.	CVP deliveries are restricted to 75% of allocation to Santa Teresa and Rinconada WTP when a low point event is active (San Luis storage < 250,000 af); however if expanded Anderson or Pacheco Reservoirs are active AND their storage is available for release, this restriction is not implemented.	CVP deliveries are restricted to 75% of allocation to Santa Teresa and Rinconada WTP when a low point event is active (San Luis storage < 250,000 af); however if expanded Anderson or Pacheco Reservoirs are active AND their storage is available for release, this restriction is not implemented.
CVP Carryover	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions
SWP Carryover	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions	45,000 AF max per year; lost if San Luis Reservoir storage goes to 2,000,000 AF; See Semitropic "Put" assumptions

	Scenario 1: 2020 Demands, 2015 UWMP	Scenario 2: 2025 Demands, 2015 UWMP	Scenario 3: 2030 Demands, 2015 UWMP	Scenario 4: 2035 Demands, 2015 UWMP	Scenario 5: 2040 Demands, 2015 UWMP
Wheeling CVP to SWP	Wheel CVP water thru SBA when we have problems with the SLR low point - when SLR storage drops below 250 TAF.	Wheel CVP water thru SBA when we have problems with the SLR low point - when SLR storage drops below 250 TAF.	Wheel CVP water thru SBA when we have problems with the SLR low point - when SLR storage drops below 250 TAF.	Wheel CVP water thru SBA when we have problems with the SLR low point - when SLR storage drops below 250 TAF.	Wheel CVP water thru SBA when we have problems with the SLR low point - when SLR storage drops below 250 TAF.
Bay Delta "Fix"	No	No	No	No	No
San Francisco Public Utilities Commission (SFPUC)	SFPUC supplies based on SFPUC Letter of Water Supply Reliability dated January 5, 2016, Water Shortage Allocation Plan adopted July 2009, and Tier 2 Allocations calculation spreadsheet based on 2012-13 base year demand	SFPUC supplies based on SFPUC Letter of Water Supply Reliability dated January 5, 2016, Water Shortage Allocation Plan adopted July 2009, and Tier 2 Allocations calculation spreadsheet based on 2012-13 base year demand	SFPUC supplies based on SFPUC Letter of Water Supply Reliability dated January 5, 2016, Water Shortage Allocation Plan adopted July 2009, and Tier 2 Allocations calculation spreadsheet based on 2012-13 base year demand	SFPUC supplies based on SFPUC Letter of Water Supply Reliability dated January 5, 2016, Water Shortage Allocation Plan adopted July 2009, and Tier 2 Allocations calculation spreadsheet based on 2012-13 base year demand	SFPUC supplies based on SFPUC Letter of Water Supply Reliability dated January 5, 2016, Water Shortage Allocation Plan adopted July 2009, and Tier 2 Allocations calculation spreadsheet based on 2012-13 base year demand
Climate Change	Included in Imported Water Allocations and San Luis Reservoir storage	Included in Imported Water Allocations and San Luis Reservoir storage	Included in Imported Water Allocations and San Luis Reservoir storage	Included in Imported Water Allocations and San Luis Reservoir storage	Included in Imported Water Allocations and San Luis Reservoir storage
3 Recycled Water					
Recycled Water Demands	Included in 2015 UWMP demand setup from retailers' master plans; 29,265 af in 2040	Included in 2015 UWMP demand setup from retailers' master plans; 29,265 af in 2040	Included in 2015 UWMP demand setup from retailers' master plans; 29,265 af in 2040	Included in 2015 UWMP demand setup from retailers' master plans; 29,265 af in 2040	Included in 2015 UWMP demand setup from retailers' master plans; 29,265 af in 2040
4 Groundwater					
Natural Groundwater Recharge (Average)	Santa Clara Plain = 34,200 AFY	Santa Clara Plain = 34,200 AFY	Santa Clara Plain = 34,200 AFY	Santa Clara Plain = 34,200 AFY	Santa Clara Plain = 34,200 AFY
	Coyote Valley Study Area = 2,300 AFY	Coyote Valley Study Area = 2,300 AFY	Coyote Valley Study Area = 2,300 AFY	Coyote Valley Study Area = 2,300 AFY	Coyote Valley Study Area = 2,300 AFY
	Llagas = 22,200 AFY	Llagas = 22,200 AFY	Llagas = 22,200 AFY	Llagas = 22,200 AFY	Llagas = 22,200 AFY
Net groundwater losses (average)	0	0	0	0	0
Includes subbasin exchanges?	No	No	No	No	No
Initial Groundwater Storage	Santa Clara Plain = 301,400 AF (EOY 2013)	Santa Clara Plain = 301,400 AF (EOY 2013)	Santa Clara Plain = 301,400 AF (EOY 2013)	Santa Clara Plain = 301,400 AF (EOY 2013)	Santa Clara Plain = 301,400 AF (EOY 2013)
	Coyote Valley Study Area = 10,300 AF (EOY 2013)	Coyote Valley Study Area = 10,300 AF (EOY 2013)	Coyote Valley Study Area = 10,300 AF (EOY 2013)	Coyote Valley Study Area = 10,300 AF (EOY 2013)	Coyote Valley Study Area = 10,300 AF (EOY 2013)
	Llagas = 26,600 AF (EOY 2013)	Llagas = 26,600 AF (EOY 2013)	Llagas = 26,600 AF (EOY 2013)	Llagas = 26,600 AF (EOY 2013)	Llagas = 26,600 AF (EOY 2013)
Maximum Groundwater Pumping Capacity	Santa Clara Plain – 200,000 AF	Santa Clara Plain – 200,000 AF	Santa Clara Plain – 200,000 AF	Santa Clara Plain – 200,000 AF	Santa Clara Plain – 200,000 AF
Groundwater Storage Capacity	Santa Clara Plain = 350,000 AF	Santa Clara Plain = 350,000 AF	Santa Clara Plain = 350,000 AF	Santa Clara Plain = 350,000 AF	Santa Clara Plain = 350,000 AF
	Coyote Valley Study Area = 25,000 AF	Coyote Valley Study Area = 25,000 AF	Coyote Valley Study Area = 25,000 AF	Coyote Valley Study Area = 25,000 AF	Coyote Valley Study Area = 25,000 AF
	Llagas = 155,000 AF	Llagas = 155,000 AF	Llagas = 155,000 AF	Llagas = 155,000 AF	Llagas = 155,000 AF
5 Reservoir Operations					
Fisheries and Aquatic Habitat Collaborative Effort (FAHCE) Operations	Active	Active	Active	Active	Active
South County LSAA Reservoir Flow Requirements	Active	Active	Active	Active	Active
Anderson / Coyote combined Reservoir Operations Rule Curve	Nov - 74,000 Dec - 82,000 Jan - 90,000 Feb - 100,000 Mar - 105,000 Apr - 111,998	Nov - 74,000 Dec - 82,000 Jan - 90,000 Feb - 100,000 Mar - 105,000 Apr - 111,998	Nov - 74,000 Dec - 82,000 Jan - 90,000 Feb - 100,000 Mar - 105,000 Apr - 111,998	Nov - 74,000 Dec - 82,000 Jan - 90,000 Feb - 100,000 Mar - 105,000 Apr - 111,998	Nov - 74,000 Dec - 82,000 Jan - 90,000 Feb - 100,000 Mar - 105,000 Apr - 111,998
Anderson and Coyote Water Rights	Max annual withdrawal of 43,370 + 24,560 AF/year	Max annual withdrawal of 43,370 + 24,560 AF/year	Max annual withdrawal of 43,370 + 24,560 AF/year	Max annual withdrawal of 43,370 + 24,560 AF/year	Max annual withdrawal of 43,370 + 24,560 AF/year
Anderson supplies to Main and Madrone	Active	Active	Active	Active	Active
Emergency Storage for Water Supply	Anderson 20,000 AF; Calero 4,000 AF	Anderson 20,000 AF; Calero 4,000 AF	Anderson 20,000 AF; Calero 4,000 AF	Anderson 20,000 AF; Calero 4,000 AF	Anderson 20,000 AF; Calero 4,000 AF
Anderson to distribution system	Release 6TAF/mo less required for downstream recharge if Anderson Storage plus inflow > 62TAF	Release 6TAF/mo less required for downstream recharge if Anderson Storage plus inflow > 62TAF	Release 6TAF/mo less required for downstream recharge if Anderson Storage plus inflow > 62TAF	Release 6TAF/mo less required for downstream recharge if Anderson Storage plus inflow > 62TAF	Release 6TAF/mo less required for downstream recharge if Anderson Storage plus inflow > 62TAF
Division of Safety of Dams (DSOD) Seismic Restrictions	Seismic restrictions remain in effect for: Almaden, Anderson, Calero, Coyote, and Guadalupe	Almaden, Anderson, Calero, and Guadalupe completed by 2025; Coyote seismic restriction remains in effect	Almaden, Anderson, Calero, and Guadalupe completed by 2025; Coyote seismic restriction remains in effect	Almaden, Anderson, Calero, and Guadalupe completed by 2025; Coyote seismic restriction remains in effect	Almaden, Anderson, Calero, and Guadalupe completed by 2025; Coyote seismic restriction remains in effect
Almaden-Calero Canal	Calero below flood rule curve; maximum of 6,000 AFY and Almaden has storage above FAHCE flow requirements	Calero below flood rule curve; maximum of 6,000 AFY and Almaden has storage above FAHCE flow requirements	Calero below flood rule curve; maximum of 6,000 AFY and Almaden has storage above FAHCE flow requirements	Calero below flood rule curve; maximum of 6,000 AFY and Almaden has storage above FAHCE flow requirements	Calero below flood rule curve; maximum of 6,000 AFY and Almaden has storage above FAHCE flow requirements
6 Recharge					
Total recharge capacity	Santa Clara Plain = 92,600 AFY	Santa Clara Plain = 96,300 AFY	Santa Clara Plain = 96,300 AFY	Santa Clara Plain = 96,300 AFY	Santa Clara Plain = 96,300 AFY
	Coyote = 17,100 AFY	Coyote = 17,100 AFY	Coyote = 17,100 AFY	Coyote = 17,100 AFY	Coyote = 17,100 AFY
	Llagas = 39,300 AFY	Llagas = 39,300 AFY	Llagas = 39,300 AFY	Llagas = 39,300 AFY	Llagas = 39,300 AFY
7 Demands					
Demand Projections	District's 2015 Urban Water Management Plan (UWMP)	District's 2015 Urban Water Management Plan (UWMP)	District's 2015 Urban Water Management Plan (UWMP)	District's 2015 Urban Water Management Plan (UWMP)	District's 2015 Urban Water Management Plan (UWMP)
Weather Demand Reduction Factors	None	None	None	None	None
Conservation ('92 Baseline) including Agriculture	Included in water demands	Included in water demands	Included in water demands	Included in water demands	Included in water demands

	Scenario 1: 2020 Demands, 2015 UWMP	Scenario 2: 2025 Demands, 2015 UWMP	Scenario 3: 2030 Demands, 2015 UWMP	Scenario 4: 2035 Demands, 2015 UWMP	Scenario 5: 2040 Demands, 2015 UWMP
Water Shortage Contingency Plan Actions	Evaluated with Water Shortage Contingency Plan actions identified in the District's 2010 Urban Water Management Plan (UWMP)	Evaluated with Water Shortage Contingency Plan actions identified in the District's 2010 Urban Water Management Plan (UWMP)	Evaluated with Water Shortage Contingency Plan actions identified in the District's 2010 Urban Water Management Plan (UWMP)	Evaluated with Water Shortage Contingency Plan actions identified in the District's 2010 Urban Water Management Plan (UWMP)	Evaluated with Water Shortage Contingency Plan actions identified in the District's 2010 Urban Water Management Plan (UWMP)
Total Countywide Demands	2020: 375,200 AF, based on District's 2015 UWMP	2025: 391,100 AF, based on District's 2015 UWMP	2030: 407,300 AF, based on District's 2015 UWMP	2035: 424,300 AF, based on District's 2015 UWMP	2040: 430,900 AF, based on District's 2015 UWMP
Untreated Water Program	Aggregated demands for: combined "San Felipe South (SS)" / "Half Rd Lateral (HL)" zones, with Central Valley Project (CVP) source; and "Guadalupe River (GU)" zone, with CVP source. No deliveries when combined SWP + CVP allocations are <= 0.51.	Aggregated demands for: combined "San Felipe South (SS)" / "Half Rd Lateral (HL)" zones, with Central Valley Project (CVP) source; and "Guadalupe River (GU)" zone, with CVP source. No deliveries when combined SWP + CVP allocations are <= 0.51.	Aggregated demands for: combined "San Felipe South (SS)" / "Half Rd Lateral (HL)" zones, with Central Valley Project (CVP) source; and "Guadalupe River (GU)" zone, with CVP source. No deliveries when combined SWP + CVP allocations are <= 0.51.	Aggregated demands for: combined "San Felipe South (SS)" / "Half Rd Lateral (HL)" zones, with Central Valley Project (CVP) source; and "Guadalupe River (GU)" zone, with CVP source. No deliveries when combined SWP + CVP allocations are <= 0.51.	Aggregated demands for: combined "San Felipe South (SS)" / "Half Rd Lateral (HL)" zones, with Central Valley Project (CVP) source; and "Guadalupe River (GU)" zone, with CVP source. No deliveries when combined SWP + CVP allocations are <= 0.51.
Increased Demand Allocation	Per retailers, maintain groundwater/treated water proportion for incremental increases in demand	Per retailers, maintain groundwater/treated water proportion for incremental increases in demand	Per retailers, maintain groundwater/treated water proportion for incremental increases in demand	Per retailers, maintain groundwater/treated water proportion for incremental increases in demand	Per retailers, maintain groundwater/treated water proportion for incremental increases in demand
8 Treated Water					
Water Treatment Plant (WTP) Capacity	Rinconada WTP = 80 MGD	Rinconada WTP = 80 MGD	Rinconada WTP = 80 MGD	Rinconada WTP = 80 MGD	Rinconada WTP = 80 MGD
	Penitencia WTP = 40 MGD	Penitencia WTP = 40 MGD	Penitencia WTP = 40 MGD	Penitencia WTP = 40 MGD	Penitencia WTP = 40 MGD
	Santa Teresa WTP = 100 MGD	Santa Teresa WTP = 100 MGD	Santa Teresa WTP = 100 MGD	Santa Teresa WTP = 100 MGD	Santa Teresa WTP = 100 MGD
Treated Water (Contract)	2020: 118,500 AF	2025: 123,200 AF	2030: 127,900 AF	2035: 133,100 AF	2040: 133,700 AF
Treated Water (Non-Contract)	20,000 AFY; 0 if SWP allocation is less than 52%	20,000 AFY; 0 if SWP allocation is less than 52%	20,000 AFY; 0 if SWP allocation is less than 52%	20,000 AFY; 0 if SWP allocation is less than 52%	20,000 AFY; 0 if SWP allocation is less than 52%
9 Project Implementation					
Dry Year Option	6,000 AFY in critically dry year (WEAP Sacramento River Index hydrologic year type = 1)	12,000 AFY in critically dry year (WEAP Sacramento River Index hydrologic year type = 1)	12,000 AFY in critically dry year (WEAP Sacramento River Index hydrologic year type = 1)	12,000 AFY in critically dry year (WEAP Sacramento River Index hydrologic year type = 1)	12,000 AFY in critically dry year (WEAP Sacramento River Index hydrologic year type = 1)
Lexington Reservoir Pipeline	Inactive	Active	Active	Active	Active
Los Gatos Ponds IPR	Inactive	Active	Active	Active	Active
Coyote IPR	Inactive	Inactive	Inactive	Inactive	Inactive
Mid-Basin IPR Injection	Inactive	Inactive	Inactive	Inactive	Inactive
Westside IPR Injection	Inactive	Inactive	Inactive	Inactive	Inactive
Other IPR projects - TBD	Inactive	Inactive	Inactive	Inactive	Inactive
Graywater Use	Inactive	Inactive	Inactive	Inactive	Inactive
North County (Saratoga) Recharge Ponds	Inactive	Active	Active	Active	Active
Sunnyvale IPR	Inactive	Inactive	Inactive	Inactive	Inactive
Campbell Well Field (treated water available to westside retailers)	Inactive	Inactive	Inactive	Inactive	Inactive
Madrone Pipeline	Active	Active	Active	Active	Active
Main Ave Pipeline	Active	Active	Active	Active	Active
Church Ponds	Inactive	Active	Active	Active	Active
New Llagas Recharge	Inactive	Inactive	Inactive	Inactive	Inactive
Los Vaqeros Reservoir Expansion	Inactive	Inactive	Inactive	Inactive	Inactive
Transfer-Bethany Pipeline	Inactive	Inactive	Inactive	Inactive	Inactive
Pacheco Expansion	Inactive	Inactive	Inactive	Inactive	Inactive
Anderson Expansion	Inactive	Inactive	Inactive	Inactive	Inactive
Regional Desalination	Inactive	Inactive	Inactive	Inactive	Inactive
Additional Conservation	Inactive	Inactive	Inactive	Inactive	Inactive

Water Shortage Contingency Plan Resolution and April 2016 Monthly Drought Report

BOARD OF DIRECTORS
SANTA CLARA VALLEY WATER DISTRICT

RESOLUTION NO. 15- 70

CONTINUING THE CALL FOR 30 PERCENT WATER USE REDUCTIONS AND A RESTRICTION ON OUTDOOR WATERING OF ORNAMENTAL LANDSCAPES OR LAWNS WITH POTABLE WATER TO TWO DAYS A WEEK THROUGH JUNE 30, 2016

WHEREAS, in California, water is a precious and limited resource that must be used wisely; and

WHEREAS, calendar year 2013 was the driest year on record and precipitation in 2014 and 2015 has been insufficient to restore local water supplies; and

WHEREAS, on March 17, 2015, the State Water Resources Control Board (State Board) expanded and extended the Emergency Regulations for Statewide Urban Water Conservation (Emergency Regulations) through Resolution 2015-0013, including new requirements that urban water suppliers limit the number of days per week that customers irrigate outdoors and prohibitions on water waste; and

WHEREAS, on March 24, 2015, the Santa Clara Valley Water District (District) Board of Directors adopted Resolution 15-24 calling for water use reductions of 30 percent for Santa Clara County in calendar year 2015 as compared to 2013 and a restriction on outdoor watering with potable water to no more than two days a week through December 2015; and

WHEREAS, on April 1, 2015, the Governor directed the State Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent; and

WHEREAS, on May 5, 2015, the State Board adopted updated Emergency Regulations that became effective May 18, 2015 to address the Governor's April 1, 2015, Executive Order; and

WHEREAS, on November 13, 2015, the Governor directed the State Board to extend water use restrictions through October 2016 if drought conditions persist through January 2016; and

WHEREAS, Santa Clara County relies on water supply imported by the State Water Project and Central Valley Project to provide water for drinking water treatment plants, replenish the local groundwater basin, and prevent the return of historic overdraft and land subsidence that could damage Bay-front levees and other critical infrastructure in northern Santa Clara County; and

WHEREAS, in 2015, State Water Project allocations were reduced to 20 percent of contract quantity, Central Valley Project water allocations for agricultural water service contractors South-of-Delta were allocated zero percent of their contract quantity; and Central Valley Project M&I water service contractors South-of-Delta will receive enough water to meet their health and safety needs or at least 25 percent of their historic use, whichever is greater; and

WHEREAS, a District priority is the continued delivery of safe, clean drinking water from its treatment plants, and the lack of precipitation and depleted storage in State and federal reservoirs has caused poor water quality conditions in the Sacramento-San Joaquin Delta and low storage levels in San Luis Reservoir that may limit or interrupt treatment plant supplies; and

WHEREAS, local watershed runoff was low in the 2015 water year, and the District's ability to augment reservoir storage with imported water is limited because of California Department of Water Resources Division of Dam Safety requirements; and

WHEREAS, the District's Water Shortage Contingency Plan, contained within its Urban Water Management Plan, guides the District's water supply management actions for supply augmentation, increased water use reduction measures, and the use of local reserve supplies; and

WHEREAS, through careful water management, Santa Clara County groundwater reserves at the start of 2014 were well within the Normal stage of the District's Water Shortage Contingency Plan, but due to limited recharge and increased groundwater pumping, these reserves were reduced by approximately 81,000 acre-feet by the end of 2014, within the lower end of the Alert stage; and

WHEREAS, groundwater reserves at the end of 2015 are estimated to fall within the Severe stage of the District's Water Shortage Contingency Plan despite significant countywide water use reduction of approximately 27 percent in 2015; and

WHEREAS, the District must maintain sufficient local surface and groundwater reserve supplies to meet local demands and cope with supply interruptions from natural disasters and catastrophic events such as an earthquake; and

WHEREAS, there is significant uncertainty as to local and statewide water supply conditions in the 2016 water year, and State Water Project and Central Valley Project allocations may continue to be reduced in 2016; and

WHEREAS, even if normal hydrology returns in 2016, continued water use reductions are needed to protect groundwater reserves; and

WHEREAS, the District through coordination with retail water agencies, local municipalities and the County of Santa Clara is continuing public outreach and education to create greater awareness of countywide water supply challenges and need for efficient water use; and

WHEREAS, the District must rely on the actions of the retail water agencies, local municipalities and the County of Santa Clara to enact and implement local ordinances and water use reduction measures; and

WHEREAS, the District continues to work closely with retail water agencies, untreated surface water customers, regulatory agencies, state and federal project operators and other water districts to manage District operations and continuing drought response. However, in consideration of the continued severity of the drought and continued limited water supply projections, continued water use reductions of 30 percent are needed to preserve groundwater storage and minimize the risk of land subsidence resuming.

NOW, THEREFORE BE IT RESOLVED that the Board of Directors of the Santa Clara Valley Water District calls for a water use reduction target equal to 30 percent of 2013 water use and a restriction on outdoor watering of ornamental landscapes or lawns with potable water to two days a week through June 30, 2016, and it is further recommended that retail water agencies, local municipalities, and the County of Santa Clara continue to implement additional mandatory measures as needed to achieve the 30 percent water use reduction target.

PASSED AND ADOPTED by the Board of Directors of Santa Clara Valley Water District by the following vote on November 24, 2015:

AYES: Directors R. Santos, L. LeZotte, T. Estremera, N. Hsueh, B. Keegan, G. Kremen

NOES: Directors None

ABSENT: Directors D. Kennedy

ABSTAIN: Directors None

SANTA CLARA VALLEY WATER DISTRICT

By: ______________________
GARY KREMEN
Chair/Board of Directors

ATTEST: MICHELE L. KING, CMC

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Clerk/Board of Directors

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APRIL 2016

Santa Clara Valley
Water District

Drought 2016
Monthly Status Report

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Table of Contents

EXECUTIVE SUMMARY

The purpose of this report is to provide a monthly water supply and water use reduction outlook in response to the ongoing drought. The data and analysis provided includes local and imported water conditions, in addition to detailed monthly water use and savings by the county's major water retailers.

Background

On January 28, 2014, the Santa Clara Valley Water District's (district) Board of Directors (board) received the initial 2014 water supply outlook and set a preliminary 2014 water use reduction target equal to 10 percent of 2013 countywide water use. On February 25, 2014, the board approved a resolution setting a countywide water use reduction target equal to 20 percent of 2013 water use through December 31, 2014, and recommended that retail water agencies, local municipalities and the County of Santa Clara (County) implement mandatory measures as needed to achieve the 20 percent water use reduction target. The call for 20 percent reductions was extended on November 25, 2014, to be in place through June 30, 2015. These actions were based on the district's Water Shortage Contingency Plan and estimated 2014 water supply conditions that showed groundwater reserves would reach the Stage 3 ("Severe") level by the end of the calendar year if water use reduction measures were not implemented.

In early 2015, the statewide drought condition was still in the severe to exceptional stage. Furthermore, local surface water and groundwater supplies were well below average and imported water allocations for 2015 were very low (25 percent or less). In consideration of the continued severity of the drought and worsening water supply projections, increased water use reductions beyond the previous call for 20 percent were determined to be necessary to preserve groundwater storage and minimize the risk of land subsidence resuming. Therefore, on March 24, 2015, the board called for 30 percent water use reductions, and recommended that retail water agencies, municipalities and the County implement mandatory measures as needed to accomplish that target, including a two day a week outdoor irrigation schedule. On November 24, 2015, the board extended the call for 30 percent savings through June 30, 2016. On April 26, 2016, the board will consider recommendations from staff on revising the call for water use reductions and other actions for the remainder of 2016.

The district's Drought Response Strategy developed in February 2014 continues to support board's increased call for water use reductions and has been an effective approach to respond to the drought. These actions are still the basis of our drought response. Certain strategies may change or increase as conditions change. The drought strategies are implemented by a cross-functional team from across the organization (convened when the Drought Response Strategy was formulated). The district's comprehensive drought response is being implemented through fifteen strategies grouped into four general categories: (A) water supply and operations; (B) water use reduction; (C) drought response opportunities; and (D) administrative and financial management. The specific strategies are detailed in Section 4.

Current Status

Severe to exceptional drought conditions continue throughout California (~74 percent). The U.S. Drought Monitor for California (April 12, 2016) reports that Santa Clara County drought severity ranges from 'D0 –Abnormally Dry' to 'D4-Exceptional Drought', depending on the location within the county. Some areas are much improved since the release of the March 1, 2016, U.S. Drought Monitor. Local and imported water supply outlook is also improved since last month. The District is cautiously optimistic as supplies are less constrained as compared to the last few years. However, our groundwater conditions are still below normal, and there are still some constraints on allocation decisions that will impact final imported water allocations.

As of April 19, 2016, our local reservoir combined storage is 92 percent of normal for this time of year (20-year average). Storage levels in northern California reservoirs (Shasta, Oroville and San Luis) above normal and some flood releases are being conducted. The district's current 2016 State Water Project (SWP) allocation is 45 percent of contract quantity, Central Valley Project preliminary allocations for agricultural water service contractors South-of-Delta are 5 percent of their contract quantity; and preliminary allocations for M&I water service contractors South-of-Delta are 55 percent.
The district maintained a reduced recharge program throughout calendar year 2015 to replenish the groundwater aquifers using available, limited quantities of local surface and imported water. There has been some improvement in groundwater levels in the key areas of north county compared to 2014. The district plans to increase recharge operations in 2016, with frequent collaboration with regulatory agencies. Year to date managed groundwater recharge in the Santa Clara Plain was about 123 percent of the five-year average, and there has been some improvement in groundwater storage in the north county compared to last year. However, end of 2016 storage is predicted to fall within Stage 2 (Alert) of the Water Shortage Contingency Plan if water supplies continue to be low (dry hydrology scenario) and no water use reduction measures are implemented. Even under average hydrology, it is unlikely that groundwater storage will return to the Normal Stage of the Water Shortage Contingency Plan in a single year. Staff continues to closely track groundwater conditions through monthly water level measurements at 225 wells and regular subsidence monitoring.

Since the drought response was initiated in 2014, the district has worked with water retailers, municipalities and the County of Santa Clara to increase water conservation efforts and public outreach, and to implement other actions to reduce water use. Through these efforts, water use data through December 2015 indicated that cumulative countywide retailer savings of 27 percent were realized compared to the same period in 2013. Through March 2016, preliminary data indicates a cumulative savings of 23 percent, and 30 percent for the month of March when compared to March 2013 (March 2016 data is partial and preliminary data).

Local water retailers have responded to the district's increased call for savings in various ways. Most retailers are calling for at least 30 percent reductions, and all have activated or adopted water use restrictions (see Table 9 for details). As a result of the call for increased savings, the retailers have geared up to increase their outreach and education efforts further. In addition, water retailers have needed to implement additional actions in response to the Governor's April 1, 2015, Executive Order (Order) and the State Water Resources Control Board's (State Board) expanded drought-related emergency regulations in effect as of May 18, 2015 (extended in February 2016). For instance, the investor owned retailers are implementing water allocation programs. In addition, the Order also required the California Energy Commission to establish standards that improve the efficiency of water appliances available for sale and installation in new and existing buildings. As a result, (as of July 2016), showerhead flow rates will be reduced to 2.0 gallons per minute and will be reduced again in July 2018, to 1.8 gallons, and flow rates for faucets will be reduced to 1.2 gallons per minute.

Two summits, one with the retailers and one with elected officials, were held in 2015 to facilitate increased water conservation and water use saving efforts and increase coordination to meet the 30 percent reduction target. A common theme between the two summits was that messaging and policy development needs to be consistent and coordinated.

Report Format

This report begins with our current drought and water supply status as shown in the monthly Water Tracker report and Drought Monitor report. The remainder of the report focuses on water use and savings data in Santa Clara County. Detailed 2016 water use and savings reports for the county are presented, as is a summary of 2013 data, which is provided for comparison as it is the base year set for water savings calculations.

Disclaimer

The data presented within this report is preliminary and subject to change. The data is presented prior to complete QA/QC and validation in an effort to quickly identify trends in water supply conditions and water use within the county. Due to the critical nature of the ongoing drought, it is important that the district and the community have an understanding of conditions and effectiveness of water use reduction efforts. Please see the Data Collection Methodology section at the end of this report for further description and disclaimers regarding the water use data reported herein. The water use data presented in the monthly reports are based on water retailer water use, which comprises just above 80 percent of countywide water use. The remaining water use consists of small or independent groundwater well users, district untreated surface water customers and recycled water.

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April 2016

Water Tracker

Santa Clara Valley Water District

A monthly assessment of trends in water supply and use for Santa Clara County, California

Outlook as of April 1, 2016

The District's Board of Directors' current call for 30% water use reduction and twice weekly landscape watering extends until June 30. Santa Clara County residents and businesses reduced water use by 20% in February 2016 compared to February 2013.

The District maintained a reduced recharge program throughout calendar year 2015 to replenish the groundwater aquifers using available, limited quantities of local surface and imported water. There has been an improvement in groundwater levels compared to this time last year. The District is taking advantage of recently improved water supply conditions by increasing recharge operations in collaboration with regulatory agencies.

The District is cautiously optimistic as supplies are less constrained as compared to the last few years. The snow water equivalent for the Northern Sierra and local precipitation are somewhat below normal, while storage in key northern California reservoirs is above normal for this time of year. Shasta, Oroville, and Folsom reservoirs are currently releasing significant flows based on flood control criteria.

Weather

▼

Rainfall in San Jose

- Month of March = 3.47 inches
- Total to date = 12.01 inches or 94% of average to date (Rainfall year is July 1 to June 30)
- April 1, 2016, Northern Sierra snowpack water content is about 95% of average for that date

Local Reservoirs

▼

- Total April 1 storage = 112,442 acre-feet
  - » 97% of 20-year average for that date
  - » 67% of total capacity
  - » 91% of restricted capacity storage (169,009 acre-feet total storage capacity limited by seismic restrictions to 122,924 acre-feet)
- No Imported Water delivered into local reservoirs during March 2016
- Total releases to streams during March for recharge and environmental purposes totaled 12,250 acre-feet

Groundwater

▶

- Groundwater (GW) Storage: End of 2016 storage is predicted to fall within Stage 3 (Severe) of the Water Shortage Contingency Plan if the remainder of 2016 is dry and no water use reduction is implemented:

	Santa Clara Subbasin		Llagas Subbasin
	Santa Clara Plain	Coyote Valley	
March managed recharge estimate (AF)	4,100	900	1,500
YTD managed recharge estimate (AF)	11,200	3,100	3,300
YTD managed recharge, % of 5-year average	123%	138%	81%
March pumping estimate (AF)	8,400	800	2,800
YTD pumping estimate (AF)	22,400	2,200	7,700
YTD pumping, % of 5-year average	141%	100%	115%
GW index well level compared to last March	Increase	Increase	Increase

YTD = Year-to-Date   AF = acre-feet

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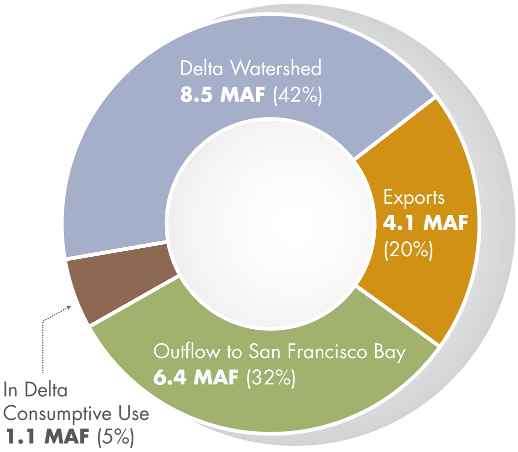
Imported Water

- 2016 State Water Project (SWP) and Central Valley Project (CVP) allocations:
  - » 2016 SWP allocation: 45% = 45,000 acre-feet
  - » 2016 CVP allocations South-of-Delta: Municipal and Industrial water service contractors: 55% of historic use, Agriculture water service contractors: 5%
- Reservoir storage information, as of March 31, 2016:
  - » Shasta Reservoir at 88% of capacity (109% of average for this date)
  - » Oroville Reservoir at 86% of capacity (114% of average for this date)
  - » San Luis Reservoir at 52% of capacity (57% of average for this date)
- District's Semitropic groundwater bank reserves: An estimated 180,500 acre-feet as of April 1, 2016.
- Estimated Hetch Hetchy deliveries to Santa Clara County:
  - » Month of March = 2,926 acre-feet
  - » 2016 Total = 8,777 acre-feet, or 18% of the five-year annual average of the year

Flows into and from the Delta
Typical annual balance
Dry/Critical Years (20.1 MAF)



Treated Water

- Below average demands of 4,755 acre-feet (estimated) delivered in March
- This total is 67% of the five-year average for March
- Estimated year-to-date = 14,615 acre-feet or 71% of the five-year average

---

Conserved Water

- Saved 63,000 acre-feet in FY15 from long-term program (baseline year is 1992)
- Long-term program goal is to save nearly 68,000 acre-feet in FY16
- The Board has called for a 30% reduction and a limit of two days per week for irrigation of ornamental landscape with potable water
- Achieved a 19% reduction in water use through the first two months of 2016, compared to 2013

Recycled Water

- Estimated March 2016 production = 870 acre-feet
- Estimated year-to-date through March = 2,200 acre-feet or 70% of the five-year average
- Silicon Valley Advanced Water Purification Center produced an estimated 3.3 billion gallons (10,100 acre-feet) of purified recycled water since March 25, 2014. The purified water is blended with existing tertiary recycled water for South Bay Water Recycling Program's customers

CONTACT US

For more information, contact **Customer relations** at **(408) 630-2880**, or visit our website at valleywater.org and use our **Access Valley Water** customer request and information system. With three easy steps, you can use this service to find out the latest information on district projects or to submit questions, complaints or compliments directly to a district staff person.

Follow us on:
/scvwd
/valleywater
/valleywater

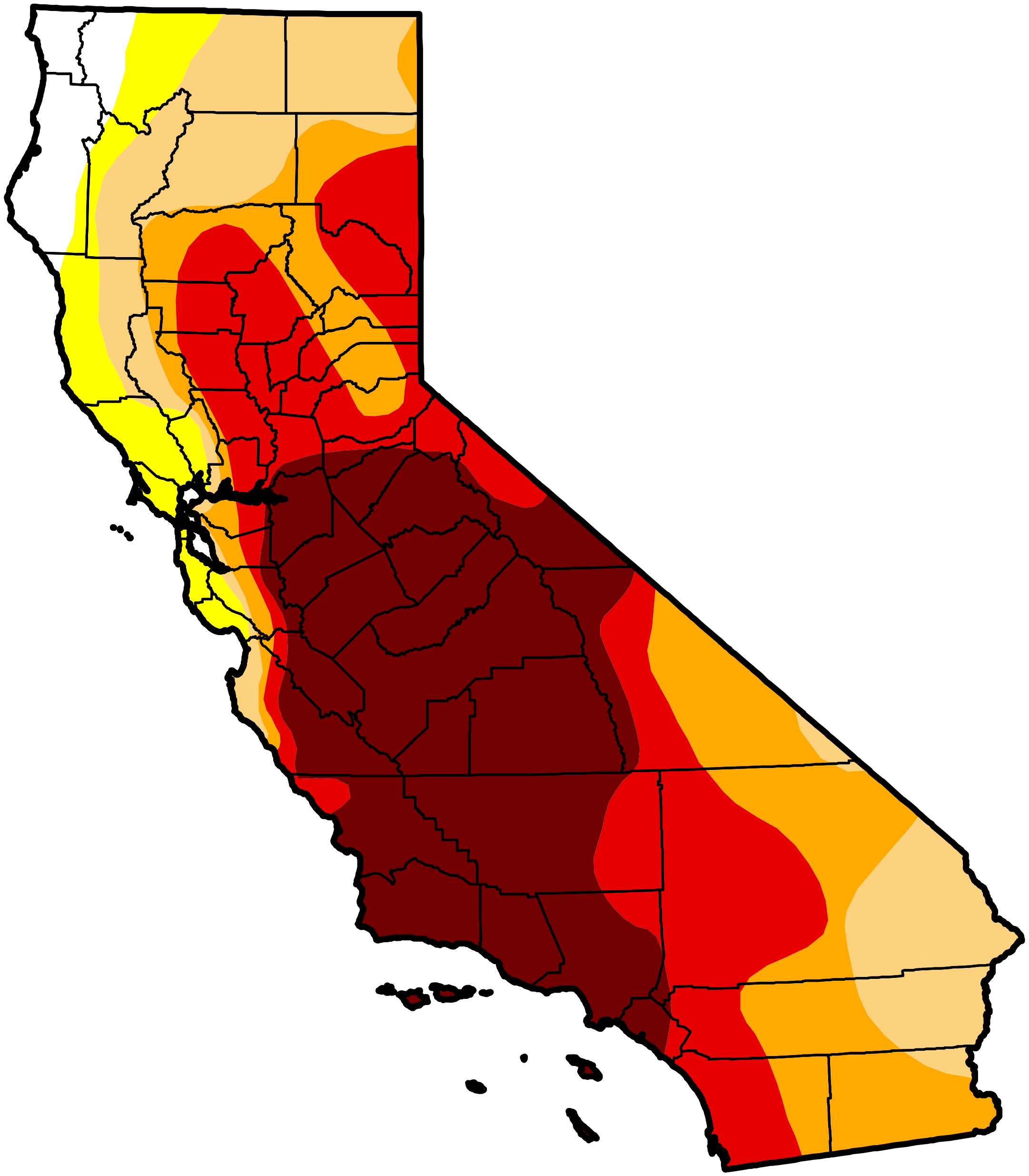
To get eNews, text **VALLEYWATER** to **22828**.

U.S. Drought Monitor
California

April 12, 2016

(Released Thursday, Apr. 14, 2016)

Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	3.55	96.45	90.58	74.37	55.25	31.68
Last Week *4/5/2016*	3.55	96.45	90.58	74.37	55.25	31.68
3 Months Ago *1/12/2016*	0.00	100.00	97.33	87.55	69.07	42.66
Start of Calendar Year *12/29/2015*	0.00	100.00	97.33	87.55	69.07	44.84
Start of Water Year *9/29/2015*	0.14	99.86	97.33	92.36	71.08	46.00
One Year Ago *4/14/2015*	0.14	99.86	98.11	93.44	66.60	44.32

Intensity:

🟨	D0 Abnormally Dry	🟥	D3 Extreme Drought
▨	D1 Moderate Drought	■	D4 Exceptional Drought
🟧	D2 Severe Drought		

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

http://droughtmonitor.unl.edu/

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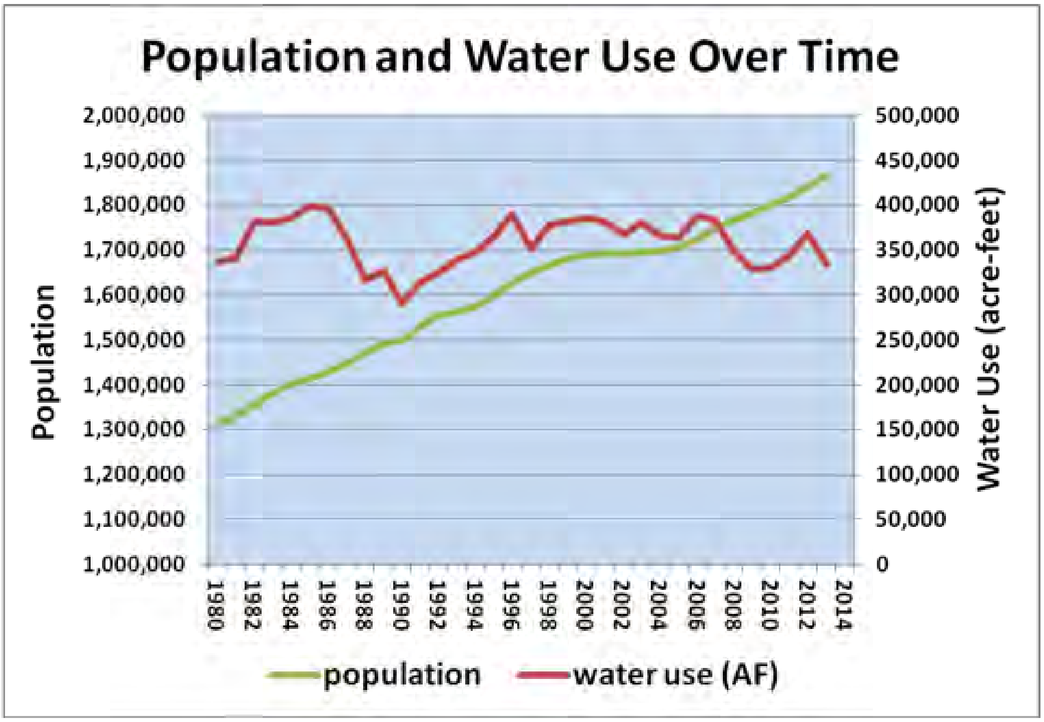
Section 1.Water Use Reductions

The district and its water retailers have a long history of implementing water conservation and water use efficiency in Santa Clara County. Because of the investments the district and its water retailers have made in water conservation since 1992, water use in the county has remained relatively flat despite a 25 percent increase in population over the same time period.

FIGURE 1 POPULATION AND WATER USE



A. District Water Use Efficiency Strategies

This section provides the context of the district's existing long-term conservation programs to the current efforts in response to the current drought.

<u>Long-term Water Conservation</u>

The district's 2012 Water Supply and Infrastructure Master Plan (Water Master Plan) acknowledges that further investments are needed to ensure adequate water supply reserves in drought years. The "Ensure Sustainability" strategy adopted by the board calls for nearly doubling current levels of conservation from 63,000 acre-feet per year to 98,800 acre-feet per year over the next 15 years, as well as other investments that will reduce the county's reliance on the Sacramento-San Joaquin Delta. Future growth in county water demands will be met through water conservation and recycled water. While the long-term Water Master Plan is being implemented, short-term gaps between annual supply and demand can occur as seen in the current severe drought. These gaps are addressed through the board-adopted Water Shortage Contingency Plan[1].

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[1] Santa Clara Valley Water District 2010 Urban Water Management Plan, http://www.valleywater.org/Services/WaterSupplyPlanning.aspx]

The district and its major water retailers have a cooperative relationship in the implementation of a variety of water conservation programs in an effort to permanently reduce water use in Santa Clara County and are an important element in meeting long-term water reliability. Water conservation programs implemented since 1992 have had a large influence in continued demand reduction. This can be seen in Figure 1 with the relative stability of demands since the mid to late 1980s, even though population has increased significantly during the same period. Using the year 1992 as a baseline, the district saved 63,600 acre-feet per Year (AFY) in year 2015, which is a little more than half of the district's long-term goal of 98,800 AFY by 2030.

Short-term Water Use Reductions

In addition to the district's long-term conservation programs, there are times, such as the current drought, when we need additional savings. When the district's board calls for short-term water use reductions, as was done in January and February of 2014, extended in November 2014 and increased to 30 percent on March 24, 2015 (extended again in November 2015), the cities and water retailers consider the implementation of their water shortage contingency plan actions identified in their Urban Water Management Plans in order to achieve the necessary shortage response. This latest call for 30 percent savings has triggered certain actions by retailers or municipalities. Actions to achieve the desired shortage response may be different for each city/water retailer depending on service area composition (commercial, industrial, residential) and source of water supplies. However, some actions are common to several of the cities/water retailers, providing for more consistent implementation and messaging. Another consistent approach is the coordinated two day/week watering schedule (watering at homes with odd numbered address or no addresses are Monday and Thursday; even numbered addresses are Tuesday and Friday). The benefit of consistent approaches such as these include: reduced confusion among residents, increased ease of implementation, and easier compliance and enforcement if needed. Reducing water consumption during water shortages is generally achieved through behavioral changes. Short term reduction generally refers to these behavioral changes that reduce water use over and above long term conservation programs.

In response to the unprecedented current water shortage situation, the district increased and expanded its short-term measures and strengthened efforts to foster its partnerships with its water retailers to promote water conservation. To that end, the district works closely with the water retailers on program development, as well as water conservation outreach and education. Please see our website for more information on our long standing programs and new efforts and rebates available in response to the current drought. www.watersavings.org

On March 24, 2015, district staff presented an outline of increased actions and coordination efforts needed to meet the 30 percent target (Figure 2). Staff updates the Board on these efforts monthly.

FIGURE 2

DROUGHT STRATEGY ELEMENT

2015 URGENT · 2016 NEAR TERM · 2017 LONG TERM

Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4

A. URGENT ACTION

- ✓ A1 Call for Additional Water Use Reductions
- ✓ A2 Expand Outreach/Media ?
- ✓ A3 Expand Water Waste Inspector Program ?
- ✓ A4 Extend Water Conservation Rebates ?
- ✓ A5 Secure (Purchase) Additional Water Supplies

B. AWARENESS TO ACTION

- ✓ B1 Summit - Elected Officials
- ✓ B2 Summit - Retailers
- B3 Update Local Ordinances
- B4 Update Existing Building Code
- ✓ B5 Pursue Legislation (e.g. enforcement) — Identify, Pursue

C. PERMANENT SOLUTIONS

- C1 Accelerated Purified Water (March 12, 2015 Work Study Session) — Planning, Design/Build to 2020+

<u>State Water Resources Control Board Emergency Regulations</u>

The State Board initial emergency regulation to increase conservation practices for all Californians became effective July 28, 2014. The regulations target outdoor urban water use and establish the minimum level of activity that residents, businesses and certain water suppliers must meet as the drought deepens. At its March 17, 2015, meeting, the State Board extended and expanded the regulations. Among the new rules was a new limit on outdoor watering of ornamental landscapes or lawns with potable water to two days a week (except where watering limits are already in place). Lawns or ornamental landscapes are not to be irrigated for 48 hours following measurable rainfall. Restaurants will only serve water upon request. Hotels must give patrons the option to reuse towels and linens. On April 1, 2015, the governor directed the State Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent (extended through October 2016). The State Board then updated the emergency regulations again on May 5, 2015 (effective May 18, 2015, and extended in February 2016), to address the governor's April 1, 2015, Executive Order (Order). For instance, the investor owned retailers are implementing water allocation programs. In addition, the Order also ordered the California Energy Commission to establish standards that improve the efficiency of water appliances available for sale and installation in new and existing buildings. As a result (as of July 2016), showerhead flow rates will be reduced to 2.0 gallons per minute and will be reduced again in July 2018, to 1.8 gallons, and flow rates for faucets will be reduced to 1.2 gallons per minute.

The district does not have requirements under the new regulations since they apply primarily to water retailers. However, to further support the new regulations and the district Board's March 24, 2015, resolution, we have been responding through other efforts as part of the district's aggressive drought response program that includes 15 strategies (See Section 4). These extra efforts include increasing our efforts in communicating with and supporting our local water retailers, cities, and the County, expanding outreach and marketing, establishing a centralized system to report water waste, and hiring additional water waste inspectors to follow-up on reports of water waste. The following is a summary of the current 2016 call level to our drought hotline (408-630-2000), incoming emails to drought@valleywater.org, and the total number of water waste reports entered into Access Valley Water (through the web, the smart phone app, or entered by staff).

Month	Incoming calls to Hotline	Incoming emails to drought@valleywater.org	New "Access Valley Water" Water Waste Cases
January 2016	**31**	**39**	**274**
February 2016	**31**	**26**	**337**
March 2016	34	32	266
2016 Totals	**96**	**97**	**877**

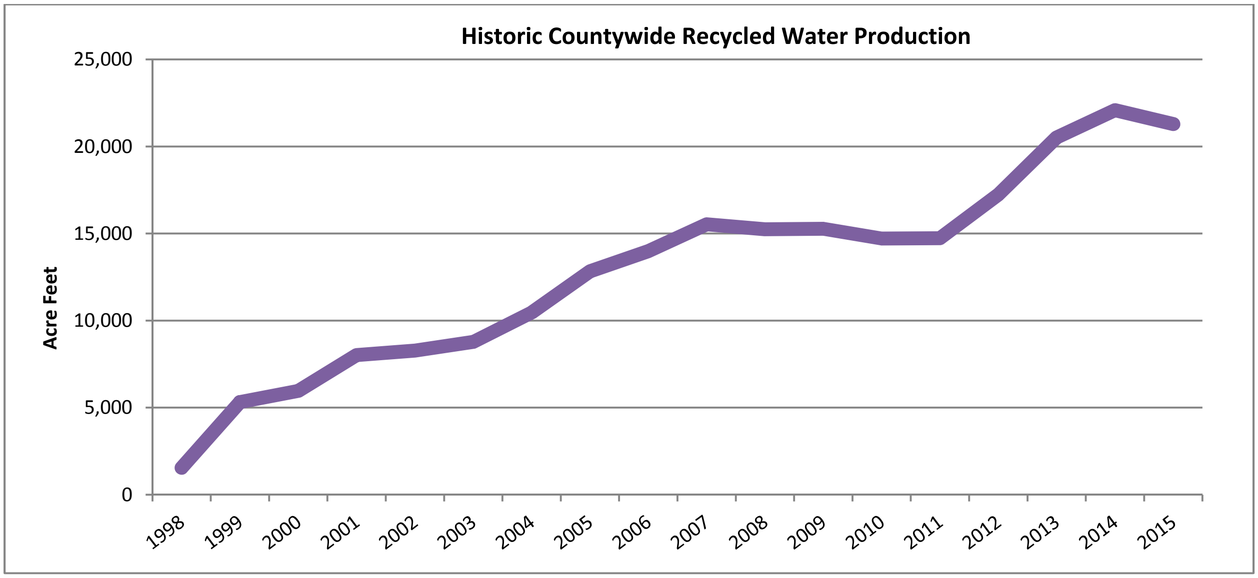
Recycled Water/Water Re-use

In addition to the district's water conservation programs, the district has partnered with cities and water retailers in the county to develop recycled water supplies to reduce demand on potable supplies. Recycled water helps in times of drought as it is an all-weather reliable source of water. Approximately 10 percent of the county's estimated total water use consisted of recycled water in 2015, limited primarily to landscaping irrigation, agriculture irrigation, cooling towers, and industrial processes. This usage is critical now and into the future to meet water supply reliability needs. For instance, approximately 21,293 AF of recycled water was estimated to have been used in 2015 countywide, thereby preserving an equal volume of drinking water supplies. In March 2016, 2,907 AF was produced. The district long term plans are to increase recycled water used in this county to at least 10 percent of total use (approximately 40,000 AF) by year 2025, and its longer-term goal is 50,000 AF by year 2035.

In the near term, the continued and extreme drought conditions has prompted a review of the timing for developing recycled water and purified water projects. Staff continue to regularly inform and engage the Board of Directors on the Expedited Purified Water Expansion Program, which includes four purified water projects. The Program also includes evaluating an extension of the Sunnyvale Wolfe Road Project (delivering recycled water to the new Apple campus) to deliver purified water for groundwater recharge. Expedited implementation of the five purified water projects could provide a capability for up to 45,000 acre-feet per year.

Recycled water use has continued to increase in recent years. Many cities cite their use of recycled water as a significant help in reducing demand for potable water. Recycled water use data at the retailer level is not available on a monthly basis for all retailers; however, the most current production data at the four waste water treatment plants is being tracked and reported in this report.

FIGURE 3 RECYCLED WATER USE



B. San Francisco Public Utilities Commission (SFPUC) Supplies

Eight retail agencies in Santa Clara County contract with the SFPUC to receive water imported from the Tuolumne River watershed as well as from watersheds around the Bay Area. This imported water is conveyed through the regional water system owned and operated by the SFPUC. The district does not control or administer SFPUC supplies delivered to the county; however, this supply reduces the demands on district-supplied water. The 2015 SFPUC water use in Santa Clara County was approximately 42,000 acre-feet, or almost 19 percent of all water retailer use.

On January 31, 2014, the SFPUC officially asked all customers of the Hetch Hetchy Regional Water System to voluntarily curtail water consumption. The goal is to reduce system-wide usage by 10 percent. The SFPUC announced it will be enforcing the July 28, 2014, State Board's emergency regulations through education, notices, and warning to customers. Repeated water waste after receiving notice and warnings from the SFPUC could result in a fine. On August 12, 2014, the SFPUC passed new emergency outdoor irrigation restrictions for all of its retail customers to reduce potable water use by 10 percent for outdoor irrigation of ornamental landscape and turf. Many of the Santa Clara County water retailers that rely on SFPUC for some, or all, of their supplies, have increased their call in response to either the district's call, the Governor's Executive Order and/or the State Board's Emergency Regulations.

On April 15, 2015, the SFPUC informed its customers that it would not be necessary to request further action from its customers system-wide in response to the Governor's April 1, 2015, Executive Order directing the State Board to develop mandatory conservation across the state to achieve a 25 percent reduction below 2013 levels in water use.

C. Countywide Water Use Savings

Water retailers’ water use savings total from February to December 2014 was just above 13 percent for the year. After statewide and local efforts were increased, water savings in 2015 (January through December 2015, compared to the same period in 2013) totaled an estimated 27 percent, which is below the year end savings target of 30 percent (in place since March 24, 2015). However, monthly water use reductions realized in the months May through August did exceed the 30% target. Preliminary cumulative savings for 2016 are 23 percent. March 2016 water use savings compared to March 2013 are 30 percent. This is much improved from February 2016 (20 percent). The significant and sustained increases in water savings in 2015, and the early 2016 savings, indicate that the messaging and tools implemented from the governor’s office to the district to the retailers is having an effect on water use behavior.

The following pages contain more detailed water use and savings information for combined major retail water providers. Section 2 contains retail water provider water use and savings data and analysis reports. Please see Section 5, Data Collection Methodologies for explanation and disclaimers.

Water Savings Target and Calculations

On February 25, 2014, the Board approved a resolution (extended on November 25, 2014, to be in place through June 30, 2015) setting a countywide water use reduction target equal to 20 percent of 2013 water use. On March 24, 2015, the Board adopted a new resolution calling for 30 percent water use reductions, and recommending that retail water agencies, municipalities and the County implement mandatory measures as needed to accomplish that target, including a two day a week outdoor irrigation schedule. This action was based on the district’s Water Shortage Contingency Plan and estimated 2015 water supply conditions that showed groundwater reserves could reach the Stage 4 (“Critical”) level by the end of the calendar year if water use reduction measures were not implemented. On November 24, 2015, the call for 30 percent was extended to June 30, 2016. On April 26, 2016, the board will consider recommendations from staff on revising the call for water use reductions and other actions for the remainder of 2016.

This monthly water use and savings report only contains data and progress towards the savings target for large water retailers, and does not provide a complete accounting of countywide water use.

Recycled water use is not subject to the water savings target because it is used in lieu of other potable water supplies. Recycled water is used primarily for irrigation, industry and agriculture. Using recycled water helps conserve drinking water supplies, provides a dependable, drought-proof, locally-controlled water supply, reduces reliance on imported water and helps preserve our saltwater and tidal habitat by reducing freshwater discharge to the bay. A small, but important and growing source of water is recycled water.

TABLE 1: CURRENT YEAR'S (2013 and 2016) RETAIL WATER USE AF AND SAVINGS

2013 (Base Year) and 2016 (Reporting Year) in Acre-feet

2013	**North County Ground water**	**South County Ground water**	**Treated Water**	**SFPUC**	**SJWC Surface**	**2013 Monthly Use**	**2013 Cumulative Use**
Jan	3,063	1,192	5,879	3,477	1,807	**15,418**	**15,418**
Feb	3,207	1,209	6,759	3,619	1,385	**16,179**	**31,598**
Mar*	5,728	1,586	8,352	3,416	595	**19,676**	**51,274**
Apr	6,556	1,906	10,876	4,591	422	**24,352**	**75,626**
May	8,415	2,314	13,650	5,894	299	**30,573**	**106,198**
Jun	8,937	2,312	13,769	5,263	516	***30,797***	**136,995**
Jul	10,579	2,614	13,646	5,803	616	***33,258***	**170,254**
Aug	9,949	2,400	13,640	6,144	584	***32,716***	**202,970**
Sep	7,957	2,305	12,845	4,970	531	***28,608***	**231,578**
Oct	8,074	2,154	11,612	4,685	502	***27,027***	**258,604**
Nov	6,826	1,692	8,749	3,671	326	***21,265***	**279,869**
Dec	6,852	1,398	7,182	3,108	203	***18,744***	**298,613**
Jan to Current Totals*	***11,998***	***3,986***	***20,990***	***10,513***	***3,787***	***51,274***	
Jan to Dec Totals	**86,144**	**23,080**	**126,961**	**54,642**	**7,785**	***298,613***	

2016	North County Ground water	South County Ground water	Treated Water	SFPUC	SJWC Surface	**2016 Monthly Use**	**2016 Cumulative Use**	*Cumulative District Source Savings*	*Cumulative NonDistrict Source Savings*	**All Sources Cumulative %Savings from 2013 <+> savings**	**Statewide Cumulative Savings (since Jan 2016)**
Jan	3,894	1,085	4,789	2,458	489	**12,715**	**12,715**	*4%*	*44%*	**18%**	*17%*
Feb	3,238	1,041	5,037	2,581	951	**12,848**	**25,563**	*10%*	*37%*	**19%**	*15%*
Mar*	3,562	1,149	4,950	2,919	1,282	**13,862**	**39,426**	*22%*	*25%*	**23%**	Not Available
Apr	-	-	-	-	-	**-**					
May	-	-	-	-	-	**-**					
Jun	-	-	-	-	-	**-**					
Jul	-	-	-	-	-	**-**					
Aug	-	-	-	-	-	**-**					
Sep	-	-	-	-	-	**-**					
Oct	-	-	-	-	-	**-**					
Nov	-	-	-	-	-	**-**					
Dec	-	-	-	-	-	**-**					
***Jan to Current**	**10,694**	**3,275**	**14,776**	**7,959**	**2,722**	**39,426**					
%Savings by Source of Supply	**11%**	**18%**	**30%**	**24%**	**28%**	**23%**					

Current monthly water use data is preliminary and subject to change.

These water use data sets do not include recycled water or surface water sales by the District

Percent savings are shown in positive values where savings have been made and negative percent values where water use is higher than the base year period (2013)

*March data does not include Stanford data - Not available as of April 19

TABLE 2: LAST YEAR'S RETAIL WATER USE AF AND SAVINGS (2015 Compared to 2013)

2013 (Base Year) and 2015 (Reporting Year) in Acre-feet

2013	North County Ground water	South County Ground water	Treated Water	SFPUC	SJWC Surface	2013 Monthly Total	2013 Cumulative Use
Jan	3,063	1,192	5,879	3,477	1,807	**15,418**	**15,418**
Feb	3,207	1,209	6,759	3,619	1,385	**16,179**	**31,598**
Mar	5,728	1,586	8,352	3,592	595	**19,852**	**51,450**
Apr	6,556	1,906	10,876	4,591	422	**24,352**	**75,802**
May	8,415	2,314	13,650	5,894	299	**30,573**	**106,374**
Jun	*8,937*	*2,312*	*13,769*	*5,263*	*516*	***30,797***	**137,171**
Jul	*10,579*	*2,614*	*13,646*	*5,803*	*616*	***33,258***	**170,430**
Aug	*9,949*	*2,400*	*13,640*	*6,144*	*584*	***32,716***	**203,146**
Sep	*7,957*	*2,305*	*12,845*	*4,970*	*531*	***28,608***	**231,754**
Oct	*8,074*	*2,154*	*11,612*	*4,685*	*502*	***27,027***	**258,780**
Nov	*6,826*	*1,692*	*8,749*	*3,671*	*326*	***21,265***	**280,045**
Dec	*6,852*	*1,398*	*7,182*	*3,108*	*203*	***18,744***	**298,789**
Jan to Current Totals*	***86,144***	***23,080***	***126,961***	***54,818***	***7,785***	***298,789***	
Jan to Dec Totals	**86,144**	**23,080**	**126,961**	**54,818**	**7,785**	**298,789**	

2015	North County Ground water	South County Ground water	Treated Water	SFPUC	SJWC Surface	2015 Monthly Use	2015 Cumulative Use	*Cumulative District Source Savings*	*Cumulative NonDistrict Source Savings*	All Sources Cumulative %Savings from 2013 <+> savings	Statewide Cumulative Savings (since Jan 2015)
Jan	5,656	1,144	5,616	2,908	339	**15,663**	**15,663**	*-23%*	*39%*	**-2%**	**7%**
Feb	5,172	1,126	4,307	3,085	1,020	**14,711**	**30,374**	*-8%*	*29%*	**4%**	**5%**
Mar	5,661	1,367	6,468	3,558	1,473	**18,527**	**48,901**	*1%*	*14%*	**5%**	**4%**
Apr	5,831	1,402	6,937	3,570	749	**18,489**	**67,390**	*10%*	*14%*	**11%**	**7%**
May	4,195	1,627	9,503	3,682	485	**19,491**	**86,881**	*18%*	*19%*	**18%**	**13%**
Jun	3,881	1,628	10,290	4,005	484	**20,288**	**107,169**	*23%*	*19%*	**22%**	**16%**
Jul	3,966	1,705	11,278	4,196	253	**21,398**	**128,567**	*25%*	*21%*	**25%**	**19%**
Aug	4,385	1,707	11,109	3,945	0.3	**21,146**	**149,713**	*27%*	*24%*	**26%**	**20%**
Sep	5,718	1,641	9,295	3,960	0.3	**20,615**	**170,328**	*27%*	*25%*	**27%**	**22%**
Oct	5,803	1,535	8,693	3,665	0.3	**19,696**	**190,025**	*27%*	*25%*	**27%**	**22%**
Nov	4,182	1,101	6,406	2,476	0.3	**14,165**	**204,190**	*27%*	*26%*	**27%**	**22%**
Dec	**4,812**	**1,021**	**4,875**	**2,974**	**0.3**	13,683	217,873	*28%*	*25%*	**27%**	**21%**
Jan to Dec Totals	**59,261**	**17,005**	**94,778**	**42,025**	**4,804**	**217,873**					
%Savings by Source of Supply	**31%**	**26%**	**25%**	**23%**	**38%**	**27%**					

Current monthly water use data is preliminary and subject to change.

These water use data sets do not include recycled water or surface water sales by the District

Percent savings are shown in positive values where savings have been made and negative percent values where water use is higher than the base year period (2013)

2013 data revised March 2016 due to Purissima correction (meter read adjustment)

Values may not add up due to rounding

TABLE 3: PAST YEAR'S RETAIL WATER USE AF AND SAVINGS (2014 Compared to 2013)

For the 2014 Water Use Savings Analysis, January was not incorporated. 2014 savings compared to 2013.

2013	North County Ground-water	South County Ground-water	Treated Water	SFPUC	SJWC Surface	2013 Monthly Total	2013 Cumulative Use Feb to Dec
January water use values are NOT used in water savings calculations or cumulative use values.							
Jan	*3,062.9*	*1,191.7*	*5,879.1*	*3,477.5*	*1,807.1*	*15,418.3*	*15,418*
Feb	3,207.4	1,208.5	6,759.1	3,619.5	1,384.8	16,179.3	16,179
Mar	5,727.9	1,585.7	8,351.9	3,591.6	594.9	19,851.9	36,031
Apr	6,556.1	1,906.2	10,876.4	4,591.3	422.2	24,352.2	60,383
May	8,415.4	2,314.3	13,650.4	5,893.9	298.6	30,572.7	90,956
Jun	8,937.2	2,311.7	13,769.1	5,262.6	516.2	30,796.8	121,753
Jul	10,579.1	2,613.8	13,645.9	5,803.2	616.3	33,258.3	155,011
Aug	9,948.6	2,399.5	13,640.2	6,143.7	584.1	32,716.1	187,727
Sep	7,957.1	2,305.2	12,844.7	4,970.5	530.6	28,608.1	216,335
Oct	8,074.3	2,153.7	11,612.2	4,684.9	501.5	27,026.6	243,362
Nov	6,826.2	1,692.3	8,749.4	3,671.2	326.0	21,265.1	264,627
Dec	6,852.4	1,397.7	7,182.5	3,108.5	202.8	18,743.8	283,371
Feb to Dec 2013 Totals	**83,082**	**21,889**	**121,082**	**51,341**	**5,978**	**283,371**	

2014	North County Ground-water	South County Ground-water	Treated Water	SFPUC	SJWC Surface	2014 Monthly Use	2014 Cumulative Use Feb to Dec		Cumulative % Savings from 2013 <+> savings
January water use values are NOT used in water savings calculations or cumulative use values.									*Not Applicable*
Jan	*6,485.1*	*1,508.7*	*8,137.3*	*3,631.3*	*0.3*	*19,762.7*	*19,762.7*		
Feb	5,769.3	1,164.3	5,173.0	2,616.7	0.3	14,723.6	14,723.6		9%
Mar	7,341.8	1,305.2	5,754.1	3,011.0	113.4	17,525.5	32,249.2		10%
Apr	*8,290.4*	*1,521.2*	*6,501.1*	4,047.5	*110.0*	20,470.3	52,719.5		13%
May	*11,378.7*	*2,166.5*	*8,750.7*	5,250.0	*54.9*	27,600.8	80,320.2		12%
Jun	*11,808.4*	*2,301.6*	*9,648.4*	4,539.0	*4.6*	28,302.0	108,622.2		11%
Jul	12,541.7	2,233.6	9,908.9	5,069.4	9.8	29,763.4	138,385.7		11%
Aug	10,760.6	2,154.8	10,182.3	4,754.4	404.9	28,257.0	166,642.7		11%
Sep	9,322.9	1,974.2	9,324.1	4,066.8	9.8	24,697.8	191,340.4		12%
Oct	8,970.0	1,775.6	8,216.0	4,172.4	0.3	23,134.3	214,474.7		12%
Nov	7,102.7	1,217.5	5,950.5	2,725.3	0.3	16,996.2	231,470.9		13%
Dec	5,618.2	1,052.3	4,046.9	2,814.3	583.6	14,115.3	245,586.2		13%
Feb to Dec 2014 Totals	**98,905**	**18,867**	**83,456**	**43,067**	**1,292**	**245,586**			
%Savings by Source of Supply	**-19%**	**14%**	**31%**	**16%**	**78%**	**13%**			

2013 data revised March 2016 due to Purissima correction (meter read adjustment)

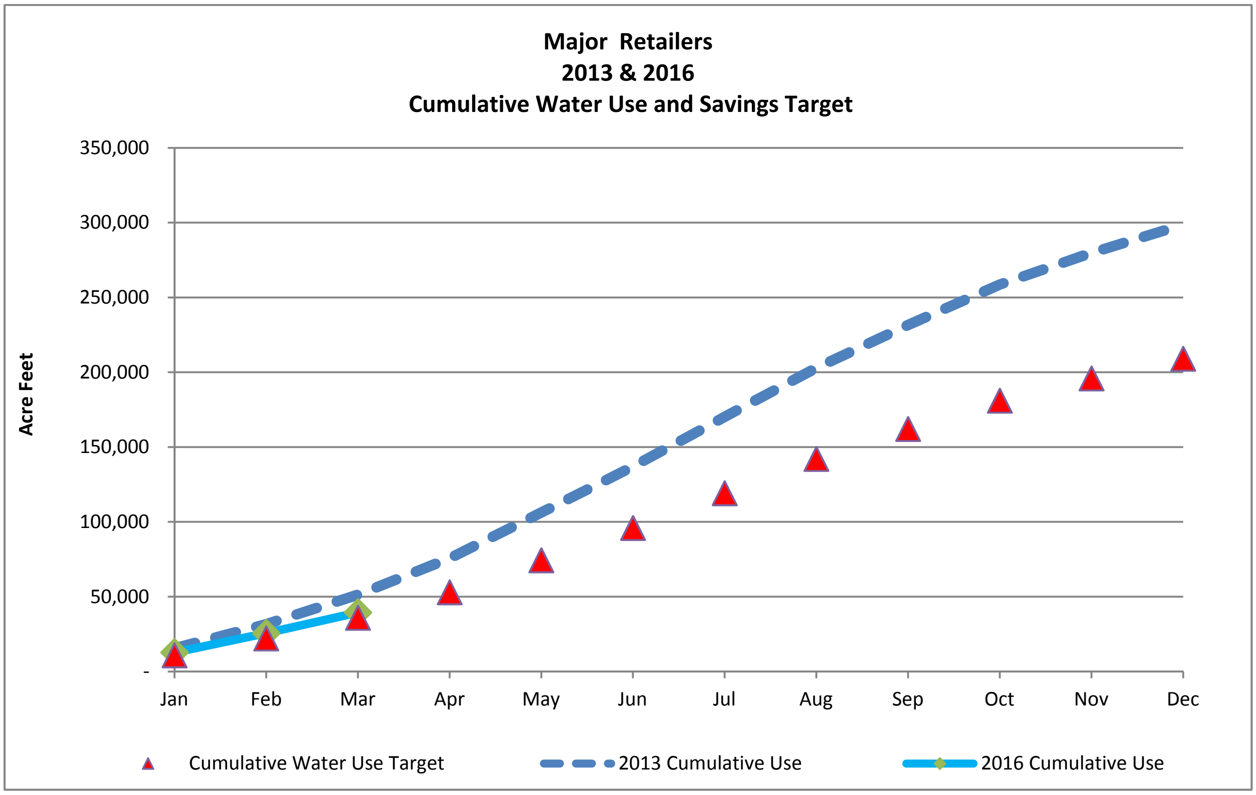
These water use data sets do not include recycled water or surface water sales by the District

Percent savings are shown in positive values where savings have been made and negative percent values

Savings Target for February is 10%. March through December is 20% of 2013 monthly use

Cumulative total from February to current month

FIGURE 3: TOTAL RETAILER WATER USE (2013 and 2016)



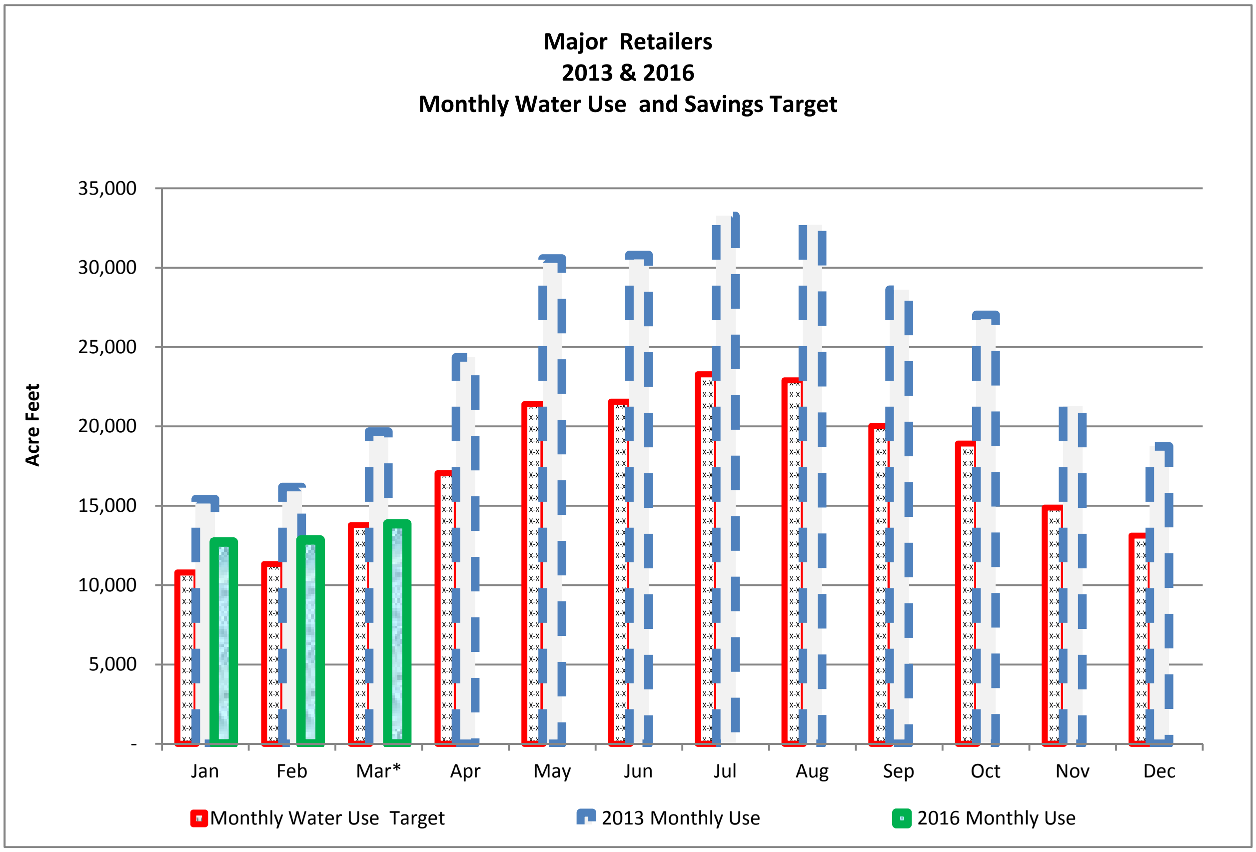
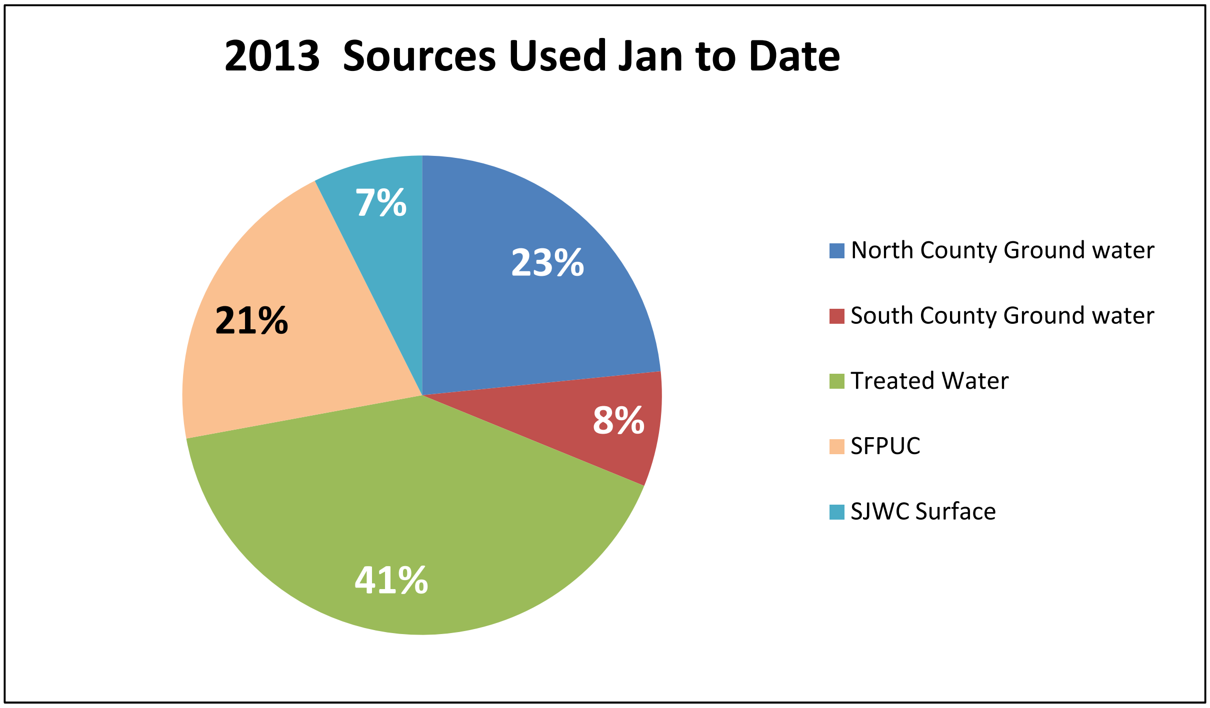


FIGURE 4: TOTAL RETAILERS WATER USE BY SOURCE (2013 and 2016)



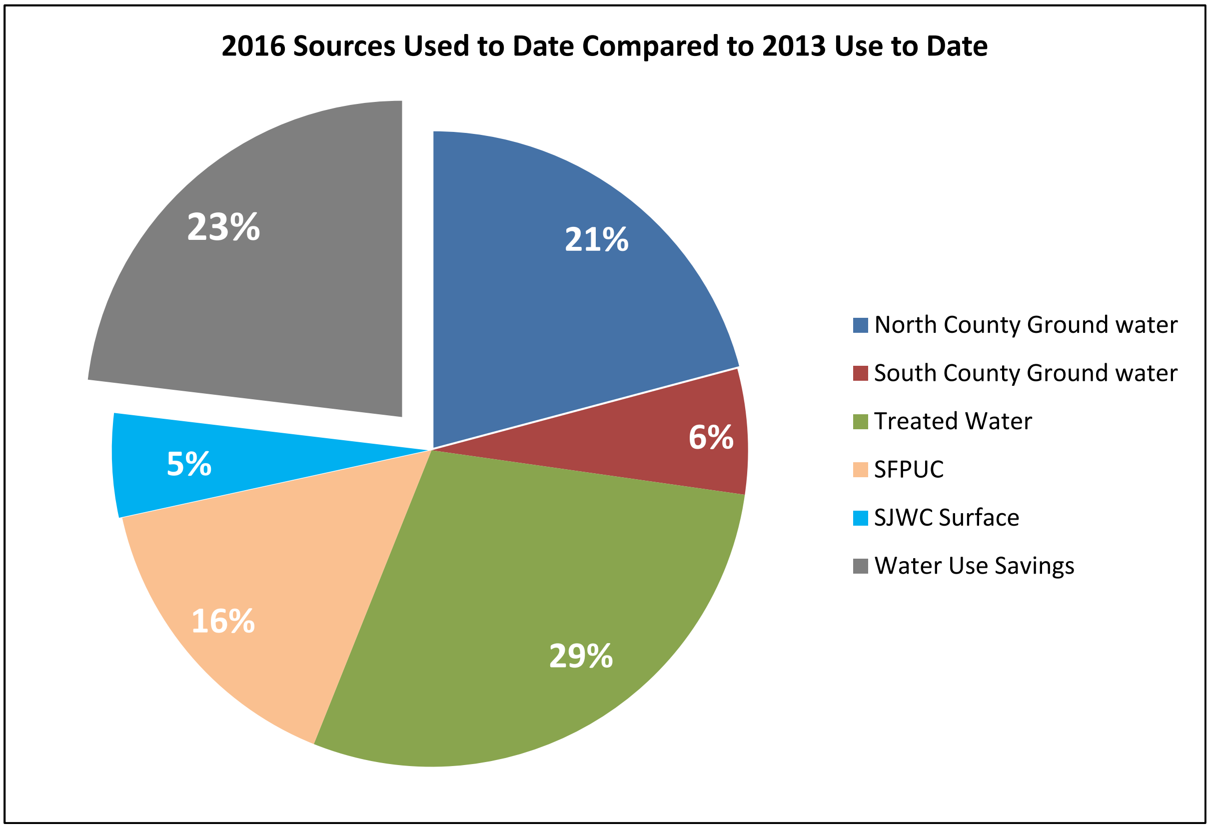


TABLE 4: COUNTY WIDE RECYCLED WATER USE 2013 and 2016

2013	**North County Recycled SBWRP WTP**	**South County Recycled SCRWA WTP**	**Palo Alto WTP**	**Sunnyvale WTP**
Jan	552.70	95.4	184.5	58.2
Feb	688.70	113.2	177.7	52.0
Mar	819.1	140.7	177.9	61.4
Apr	1,203.0	195.4	194.9	60.6
May	1,574.3	205.7	189.5	51.6
Jun	1,718.3	245.3	180.7	53.6
Jul	1,985.0	284.5	222.1	62.8
Aug	1,824.8	230.5	263.5	57.6
Sep	1,629.6	157.1	247.5	56.0
Oct	1,412.0	115.8	245.4	53.7
Nov	993.1	113.7	218.7	53.7
Dec	894.9	142.2	220.5	37.2
Jan to Dec 2013 Totals	*15,295.5*	*2,039.5*	*2,522.9*	*658.4*
Jan to Current Month Totals	*2,060.5*	*349.3*	*540.1*	*171.6*

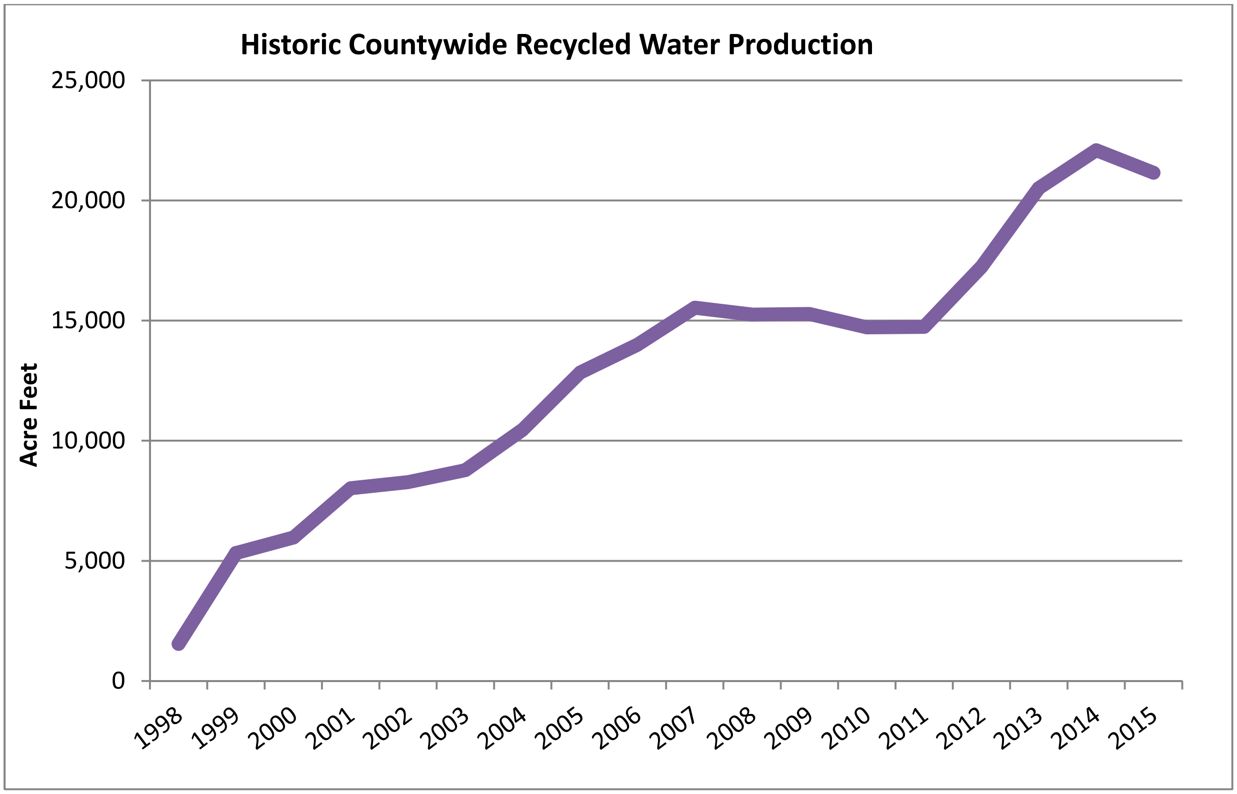
Waters use values are in acre feet

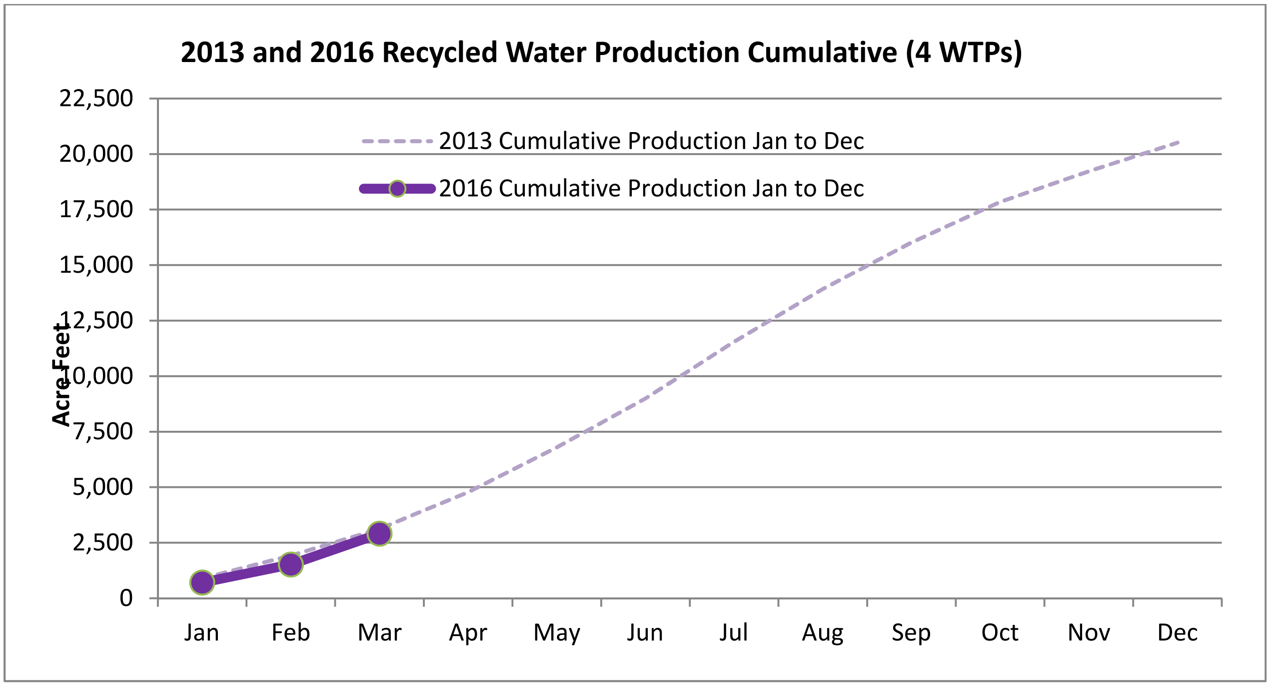
Red values are preliminary data, subject to change and validation

2016	**North County Recycled SBWR WTP**	**South County Recycled SCRWA WTP**	**Palo Alto WTP**	**Sunnyvale WTP**
Jan	431.5	7.2	253.9	14.5
Feb	541.7	18.1	227.5	23.6
Mar	892.1	179.9	274.3	43.01
Apr				
May				
Jun				
Jul				
Aug				
Sep				
Oct				
Nov				
Dec				
Jan to Current Totals	*1,865.3*	*205.2*	*755.7*	*81.2*
% of 2013 to DATE	***91%***	***59%***	***140%***	***47%***

Tables contain recycled water volumes produced and sold for re-use in the county. Data does not account for system losses prior to end use. (Therefore, ‘use’ and ‘production’ are interchangeable terms in these tables.)

FIGURE 5: COUNTY WIDE RECYCLED WATER USE 2013 and 2016





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Section 2. Retailers' Water Use and Savings

This section contains detailed water use data from 2013 and 2016, summarizes cumulative water use saving percent, and illustrates cumulative and monthly trends in water use and savings at the water retailer level. [Please see Section 5, Data Collection Methodology for more information]

TABLE 5: 2016 RETAILER CONSERVATION ACTIONS AND SAVINGS SUMMARY

Water Retailer	Call for Savings	Cumulative Water Use (AF)	Monthly Savings March 2016	Cumulative Savings Jan to March 2016
San Jose Water Co.	30%	19,265	31%	22%
Santa Clara (City)	30%	3,441	22%	18%
Sunnyvale	30%	3,078	25%	21%
San Jose Municipal	30%	2,868	31%	22%
California Water Service	32%	1,534	44%	37%
Palo Alto	24%	1,812	24%	27%
Mountain View	16%	1,587	23%	28%
Great Oaks	30%	1,608	33%	25%
Milpitas	30%	1,761	12%	16%
Gilroy	30%	1,190	34%	20%
Morgan Hill	30%	929	38%	24%
Purissima Hills Water	[2]	158	54%	49%
Stanford [1]	[2]	193	[1]	[1]
Total		**39,426**	**30%**	**23%**

Values may not add up due to rounding.

[1] data not available as of April 19, 2016

[2] 2-day/week water restrictions

TABLE 6: 2016 RETAILER CUMULATIVE AND MONTHLY SAVINGS SUMMARY

Cumulative Water Retailer Savings	Jan to Jan	Jan to Feb	Jan to Mar	Jan to April	Jan to May	Jan to June	Jan to July	Jan to Aug	Jan to Sept	Jan to Oct	Jan to Nov	Jan to Dec
San Jose Water Company	16%	17%	22%									
Santa Clara, city	19%	16%	18%									
Sunnyvale	14%	18%	21%									
San Jose Municipal Water	11%	16%	22%									
California Water Service	35%	33%	37%									
Palo Alto	24%	29%	27%									
Mountain View	30%	31%	28%									
Great Oaks	19%	20%	25%									
Milpitas	17%	18%	16%									
Gilroy	8%	11%	20%									
Morgan Hill	5%	13%	24%									
Purissima Hills Water	59%	45%	49%									
Stanford	34%	39%	[1]									
Combined Cumulative Savings	**18%**	**19%**	**23%**									
Month to Month Water Retailer Savings	Jan to Jan	Feb to Feb	Mar to Mar	April to April	May to May	June to June	July to July	Aug to Aug	Sept to Sept	Oct to Oct	Nov to Nov	Dec to Dec
San Jose Water Company	16%	18%	31%									
Santa Clara (City of)	19%	12%	22%									
Sunnyvale	14%	22%	25%									
San Jose Municipal Water	11%	22%	31%									
California Water Service	35%	31%	44%									
Palo Alto	24%	34%	24%									
Mountain View	30%	32%	23%									
Great Oaks	19%	21%	33%									
Milpitas	17%	20%	12%									
Gilroy	8%	13%	34%									
Morgan Hill	5%	19%	38%									
Purissima Hills Water	59%	26%	54%									
Stanford	34%	43%	[1]									
Combined Month to Month 2015	**18%**	**21%**	**30%**									

[1] Stanford data not available due to late month meter read by SFPUC

TABLE 7: 2015 RETAILER CUMULATIVE AND MONTHLY SAVINGS SUMMARY

Cumulative Water Retailer Savings	Jan to Jan	Jan to Feb	Jan to Mar	Jan to April	Jan to May	Jan to June	Jan to July	Jan to Aug	Jan to Sept	Jan to Oct	Jan to Nov	Jan to Dec
San Jose Water Company	-3%	1%	3%	10%	18%	22%	25%	27%	27%	27%	28%	**28%**
Santa Clara, city	2%	5%	4%	6%	11%	15%	16%	19%	18%	18%	19%	**18%**
Sunnyvale	-6%	7%	6%	12%	20%	23%	26%	27%	27%	26%	27%	**26%**
San Jose Municipal Water	-8%	2%	4%	11%	19%	22%	25%	26%	26%	26%	26%	**26%**
California Water Service	8%	11%	10%	15%	23%	27%	29%	31%	31%	32%	32%	**33%**
Palo Alto	10%	15%	12%	16%	25%	26%	27%	29%	29%	29%	29%	**29%**
Mountain View	0%	13%	10%	15%	22%	24%	25%	28%	28%	28%	28%	**28%**
Great Oaks	0%	5%	7%	13%	20%	24%	26%	28%	28%	29%	29%	**29%**
Milpitas	1%	6%	4%	8%	14%	16%	18%	20%	19%	19%	19%	**18%**
Gilroy	-5%	0%	5%	12%	18%	22%	25%	26%	26%	26%	27%	**26%**
Morgan Hill	-8%	-2%	6%	19%	24%	26%	30%	31%	31%	32%	33%	**33%**
Purissima Hills Water	-4%	14%	7%	21%	25%	29%	31%	31%	29%	27%	28%	**29%**
Stanford	-3%	6%	7%	13%	22%	24%	24%	26%	25%	26%	28%	**28%**
Combined Cumulative Savings	**-2%**	**4%**	**5%**	**11%**	**18%**	**22%**	**25%**	**26%**	**27%**	**27%**	**27 %**	**27%**
Month to Month Water Retailer Savings	Jan to Jan	Feb to Feb	Mar to Mar	April to April	May to May	June to June	July to July	Aug to Aug	Sept to Sept	Oct to Oct	Nov to Nov	Dec to Dec
San Jose Water Company	-3%	5%	7%	25%	36%	35%	38%	36%	31%	28%	33%	**30%**
Santa Clara (City of)	2%	7%	3%	11%	26%	29%	20%	33%	11%	17%	30%	**16%**
Sunnyvale	-6%	18%	4%	27%	38%	36%	37%	36%	25%	21%	29%	**20%**
San Jose Municipal Water	-8%	11%	7%	24%	39%	33%	35%	34%	25%	24%	30%	**21%**
California Water Service	8%	15%	8%	26%	40%	40%	39%	37%	34%	36%	42%	**44%**
Palo Alto	10%	19%	6%	25%	46%	31%	31%	38%	28%	32%	36%	**26%**
Mountain View	0%	24%	3%	27%	38%	33%	31%	41%	25%	27%	37%	**19%**
Great Oaks	0%	10%	10%	25%	38%	37%	36%	35%	33%	30%	34%	**27%**
Milpitas	1%	11%	-1%	17%	31%	24%	25%	32%	13%	16%	23%	**10%**
Gilroy	-5%	5%	13%	24%	34%	33%	35%	32%	28%	27%	30%	**24%**
Morgan Hill	-8%	3%	17%	39%	35%	35%	42%	34%	36%	35%	46%	**38%**
Purissima Hills Water	-4%	25%	-3%	40%	37%	40%	41%	27%	19%	8%	37%	**47%**
Stanford	-3%	13%	8%	29%	44%	35%	19%	42%	18%	37%	43%	**37%**
Combined Month to Month 2015	**-2%**	**9%**	**7%**	**24%**	**36%**	**34%**	**36%**	**35%**	**28%**	**27%**	**33%**	**27%**

TABLE 8: 2014 RETAILER CUMULATIVE SAVINGS SUMMARY

(Savings calculated from February 2014 to December 2014)

Cumulative Water Retailer Savings	Feb to Feb	Feb to Mar	Feb to April	Feb to May	Feb to June	Feb to July	Feb to Aug	Feb to Sept	Feb to Oct	Feb to Nov	Feb to Dec	Total Savings	Savings District Source	Savings SFPUC Supply
San Jose Water Company	3%	6%	10%	10%	9%	10%	10%	11%	11%	12%	13%	**13%**	13%	N/A
Santa Clara (City of)	7%	8%	9%	7%	8%	8%	8%	8%	8%	9%	10%	**10%**	9%	16%
Sunnyvale	16%	15%	17%	15%	14%	14%	14%	13%	13%	13%	14%	**14%**	7%	22%
San Jose Municipal Water	15%	16%	18%	14%	12%	12%	12%	12%	12%	12%	13%	**13%**	6%	4%
California Water Service	15%	18%	19%	15%	13%	13%	13%	13%	14%	14%	16%	**16%**	16%	N/A
Palo Alto	32%	25%	16%	17%	16%	13%	15%	15%	15%	16%	16%	**16%**	N/A	16%
Mountain View	24%	18%	18%	17%	14%	14%	14%	14%	14%	15%	16%	**16%**	-6%	19%
Great Oaks	7%	11%	16%	15%	13%	14%	14%	15%	15%	16%	16%	**16%**	16%	N/A
Milpitas	11%	11%	11%	11%	10%	10%	11%	11%	11%	11%	11%	**11%**	-1%	16%
Gilroy	2%	11%	17%	14%	13%	12%	12%	13%	13%	14%	14%	**14%**	14%	N/A
Morgan Hill	-7%	9%	15%	16%	16%	16%	15%	15%	16%	18%	19%	**19%**	19%	N/A
Purissima Hills Water	45%	34%	28%	14%	14%	12%	14%	14%	14%	16%	16%	**16%**	N/A	16%
Stanford	24%	21%	15%	10%	10%	7%	8%	8%	6%	8%	7%	**7%**	N/A	7%
Total Cumulative Savings	9%	11%	13%	12%	11%	11%	11%	12%	12%	13%	13%	**13%**	**11%**	**16%**

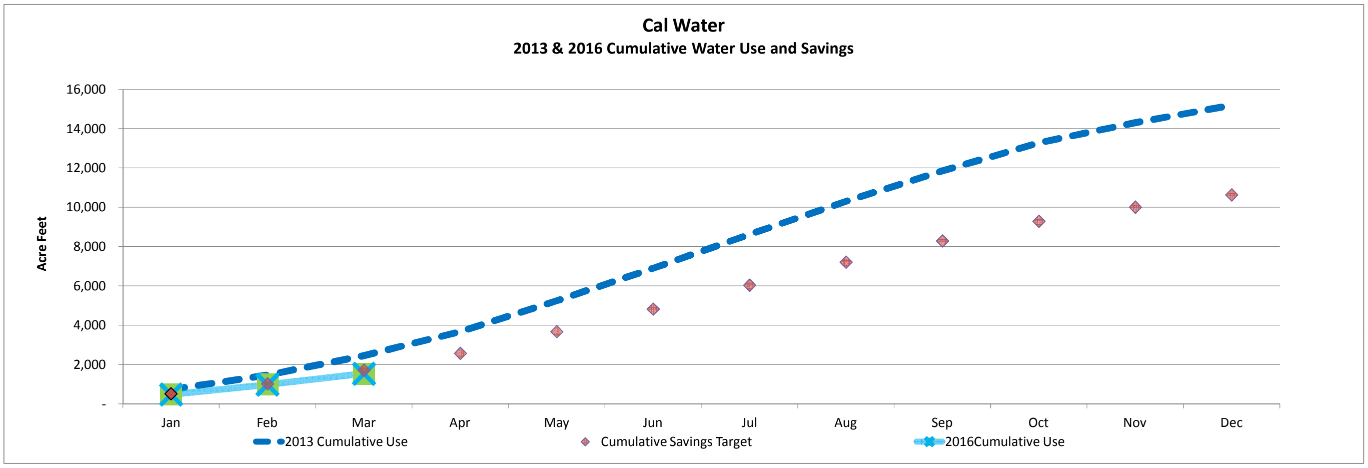
California Water Service Company

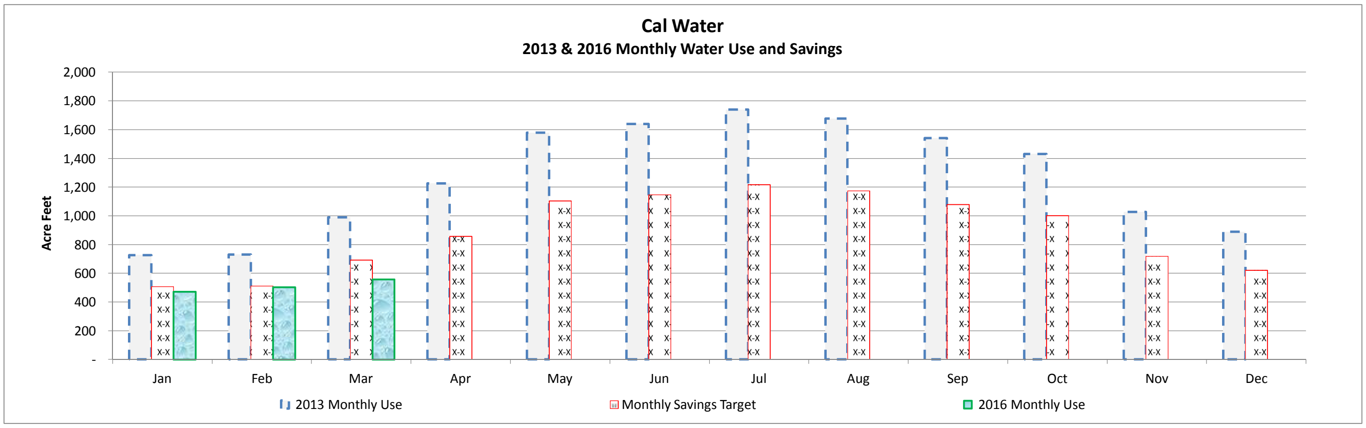
2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Surface	2013 Monthly Use
Jan	215.0	510.0	-	-	725.0
Feb	254.0	477.0	-	-	731.0
Mar	446.0	544.0	-	-	990.0
Apr	439.0	786.0	-	-	1,225.0
May	672.0	906.0	-	-	1,578.0
Jun	709.0	930.0	-	-	1,639.0
Jul	690.0	1,049.0	-	-	1,739.0
Aug	437.0	1,241.0	-	-	1,678.0
Sep	321.0	1,221.0	-	-	1,542.0
Oct	363.0	1,068.0	-	-	1,431.0
Nov	183.0	844.0	-	-	1,027.0
Dec	262.0	626.0	-	-	888.0
Jan to Current Month	***915.0***	***1,531.0***	***-***	***-***	***2,446.0***
January to December Total	***4,991.0***	***10,202.0***	-	-	***15,193.0***

2016	Groundwater	Treated Water	SFPUC	Surface	2016 Monthly Use
Jan	264.0	208.0	-	-	472.0
Feb	288.0	216.0	-	-	504.0
Mar	260.0	298.0	-	-	558.0
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month	***812.0***	***722.0***	***-***	***-***	***1,534.0***
%Savings by Source of Supply	***11%***	***53%***			***37%***

Cumulative % Savings Jan to December (+) = savings
35%
33%
37%
-
-
-
-
-
-
-
-
-


Cal Water
2013 & 2016 Cumulative Water Use and Savings


Cal Water
2013 & 2016 Monthly Water Use and Savings

Notes

Current monthly water use data is preliminary and subject to change.

Percent savings are shown in positive values where savings have been made and negative percent values where water use is higher than the base year period (2013)

Cumulative % Savings shows the target savings for all months combined at that period in time.

Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.

N/A = Not Applicable

'-' Not Available

Santa Clara Valley Water District

As of 4/18/2016

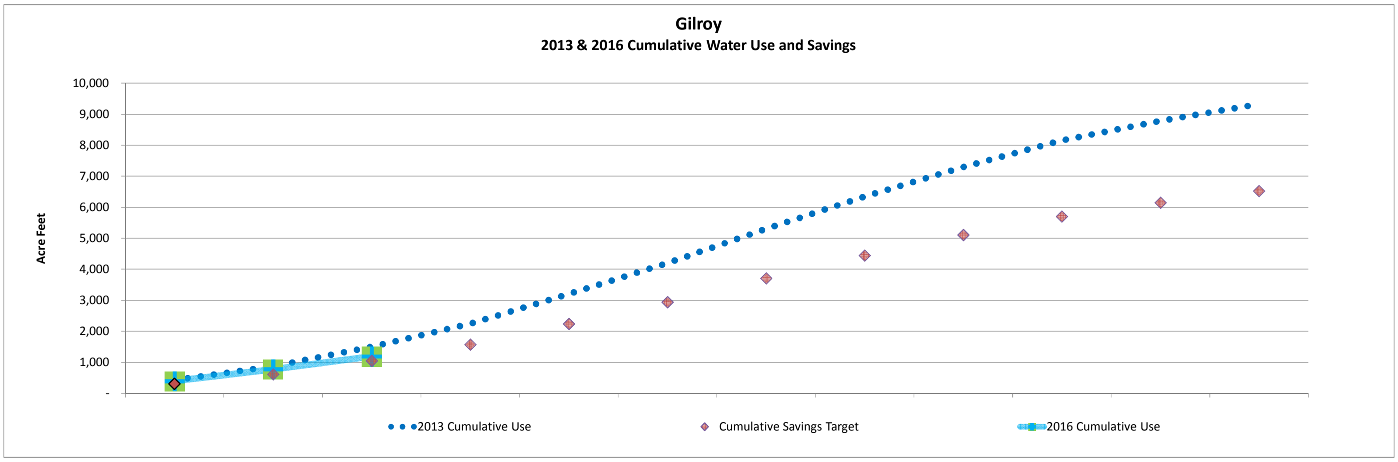
Gilroy

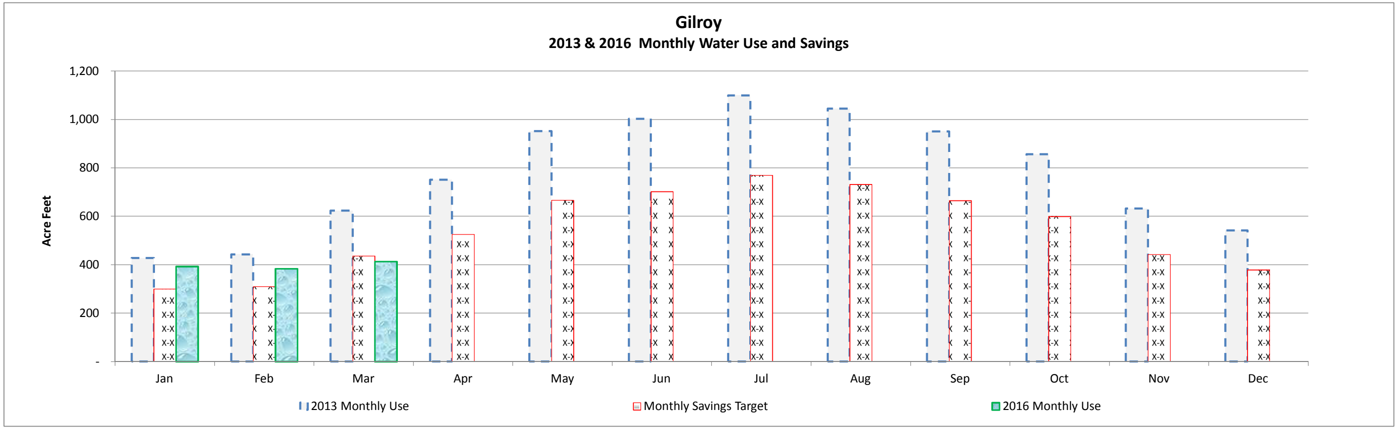
2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Surface Water	2013 Monthly Use
Jan	428.0	-	-	-	428.0
Feb	443.0	-	-	-	443.0
Mar	623.0	-	-	-	623.0
Apr	751.0	-	-	-	751.0
May	952.0	-	-	-	952.0
Jun	1,002.6	-	-	-	1,002.6
Jul	1,099.5	-	-	-	1,099.5
Aug	1,045.0	-	-	-	1,045.0
Sep	950.0	-	-	-	950.0
Oct	856.0	-	-	-	856.0
Nov	632.0	-	-	-	632.0
Dec	541.0	-	-	-	541.0
Jan to Current Month Totals	**1,494.0**	**-**	-	-	**1,494.0**
January to December Total	**9,323.1**	**-**	-	-	**9,323.1**

2016	Groundwater	Treated Water	SFPUC	Surface Water	2016 Monthly Use
Jan	392.7	-	-	-	392.7
Feb	383.8	-	-	-	383.8
Mar	413.1	-	-	-	413.1
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**1,189.6**	**-**	-	-	**1,189.6**
%Savings by Source of Supply	**20%**				**20%**

Cumulative % Savings Jan to December (+) = savings
8%
11%
20%
-
-
-
-
-
-
-
-
-





Notes

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Cumulative % Savings shows the target savings for all months combined at that period in time.

Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.

N/A = Not Applicable

- Not Available

Santa Clara Valley Water District

As of 4/19/2016

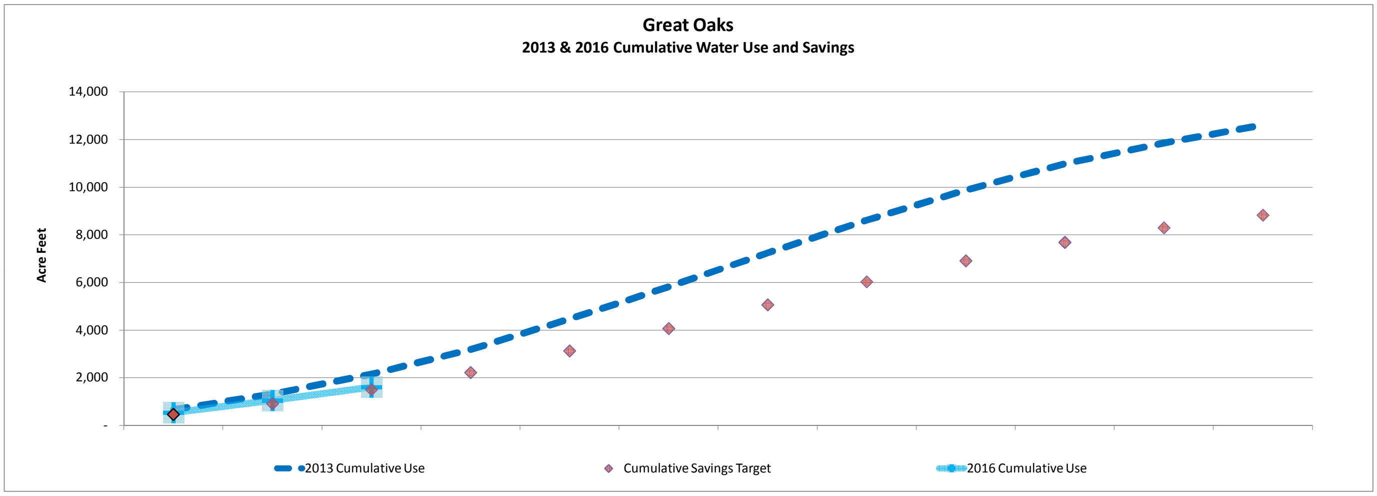
Great Oaks Water Company

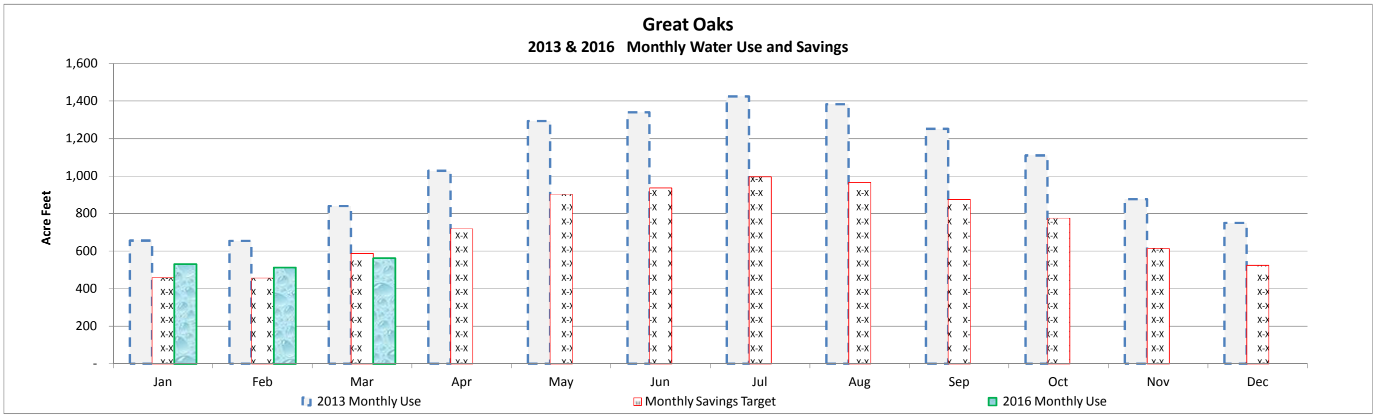
2013 and 2016 Water Use Compared to Target

2013	Ground water - Zone 2	Ground water - Zone 5	Treated Water	SFPUC	2013 Monthly Use
Jan	240.8	415.2	-	-	656.0
Feb	277.6	376.7	-	-	654.3
Mar	430.5	409.7	-	-	840.2
Apr	652.3	376.3	-	-	1,028.6
May	901.6	391.4	-	-	1,293.0
Jun	970.8	368.9	-	-	1,339.7
Jul	1,056.8	366.9	-	-	1,423.7
Aug	1,040.8	342.0	-	-	1,382.8
Sep	882.6	368.9	-	-	1,251.5
Oct	751.0	359.7	-	-	1,110.7
Nov	534.4	343.3	-	-	877.7
Dec	444.5	306.2	-	-	750.7
Jan to Current Month Totals	**948.9**	**1,201.6**	**-**	**-**	**2,150.5**
January to December Total	**8,183.7**	**4,425.2**	**-**	**-**	**12,608.9**

2016	Ground water - Zone 2	Ground water - Zone 5	Treated Water	SFPUC	2016 Monthly Use
Jan	170.6	360.7	-	-	531.3
Feb	176.6	337.6	-	-	514.2
Mar	176.8	386.1	-	-	562.9
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**524.0**	**1,084.5**	-	-	**1,608.5**
%Savings by Source of Supply	**45%**	**10%**	-	-	**25%**

Cumulative % Savings Jan to December (+) = savings
19%
20%
25%





Notes

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Cumulative % Savings shows the target savings for all months combined at that period in time.

Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.

N/A = Not Applicable

- Not Available

Santa Clara Valley Water District

As of 4/19/2016

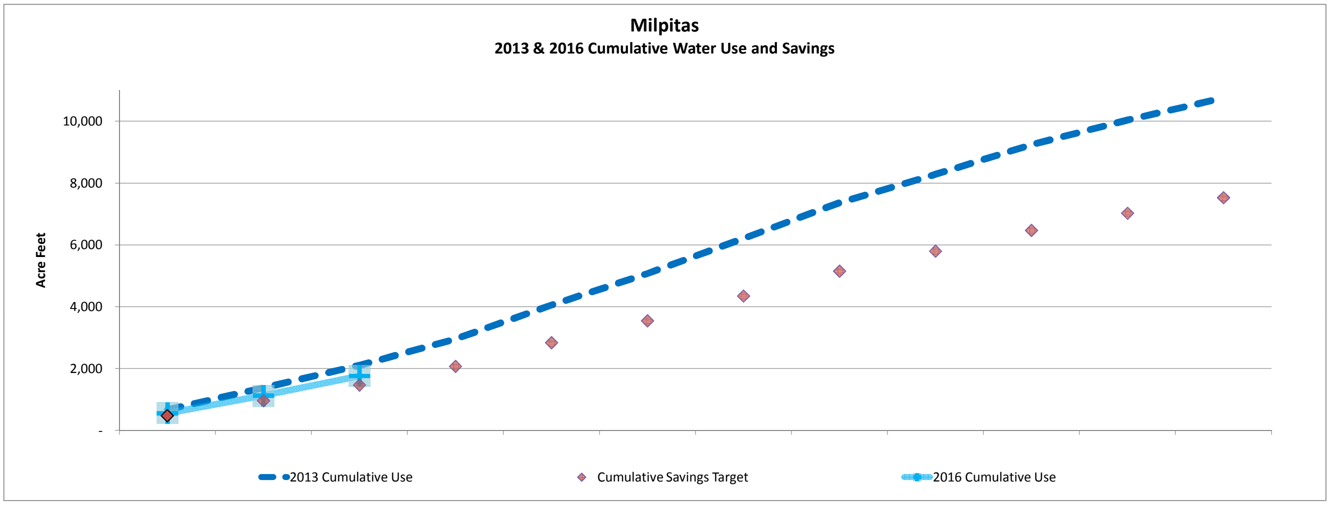
Milpitas, City

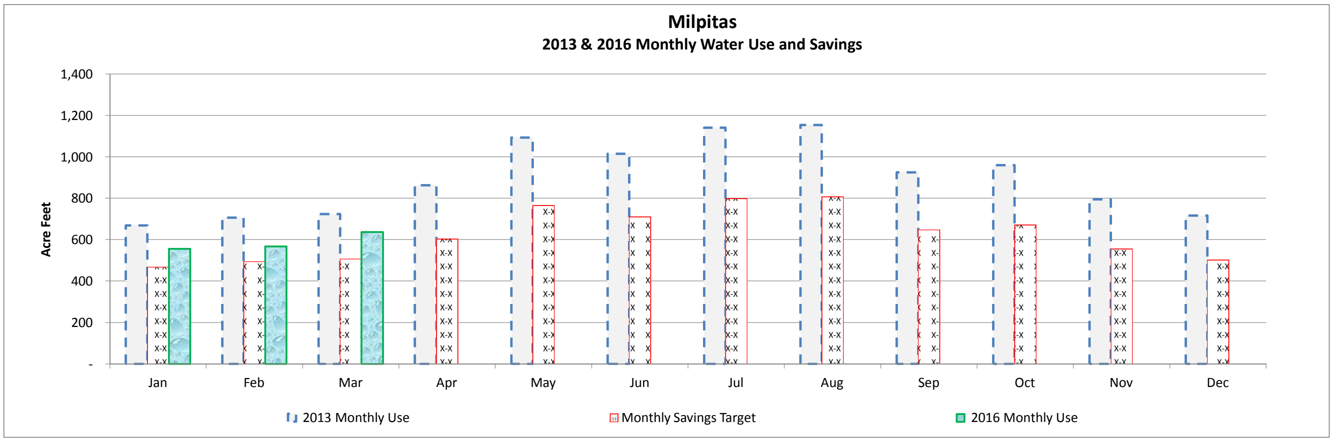
2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Surface Water	2013 Monthly Use
Jan	-	235.0	433.0	-	668.0
Feb	-	228.0	478.0	-	706.0
Mar	-	263.0	461.0	-	724.0
Apr	-	288.0	574.0	-	862.0
May	-	323.0	770.0	-	1,093.0
Jun	-	310.0	705.0	-	1,015.0
Jul	-	377.0	764.0	-	1,141.0
Aug	-	298.0	855.0	-	1,153.0
Sep	-	182.0	743.0	-	925.0
Oct	-	228.0	731.0	-	959.0
Nov	-	253.0	541.0	-	794.0
Dec	-	265.0	452.0	-	717.0
Jan to Current Month Totals		**726.0**	**1,372.0**		**2,098.0**
January to December Total	-	**3,250.0**	**7,507.0**	**-**	**10,757.0**

2016	Groundwater	Treated Water	SFPUC	Surface Water	2016 Monthly Use
Jan	-	233.5	322.6	-	556.2
Feb	-	238.0	330.2	-	568.2
Mar	-	271.4	365.5	-	636.9
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**-**	**742.9**	**1,018.3**	**-**	**1,761.2**
%Savings by Source of Supply	-	**-2%**	**26%**	-	**16%**

Cumulative % Savings Jan to December (+) = savings
17%
18%
16%
-
-
-
-
-
-
-
-
-


Milpitas
2013 & 2016 Cumulative Water Use and Savings


Milpitas
2013 & 2016 Monthly Water Use and Savings

Notes

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Cumulative % Savings shows the target savings for all months combined at that period in time.
Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.
January to March 2015 savings targets at 20% reductions compared to the same period in 2013, and the remaining months are at the March 24, 2015 call for 30% savings.
N/A = Not Applicable
- Not Available
SFPUC - San Francisco Public Utilities Commission Water Sales. SFPUC 2014 Drought response is a call for voluntary 10% savings

Santa Clara Valley Water District

As of 4/18/2016

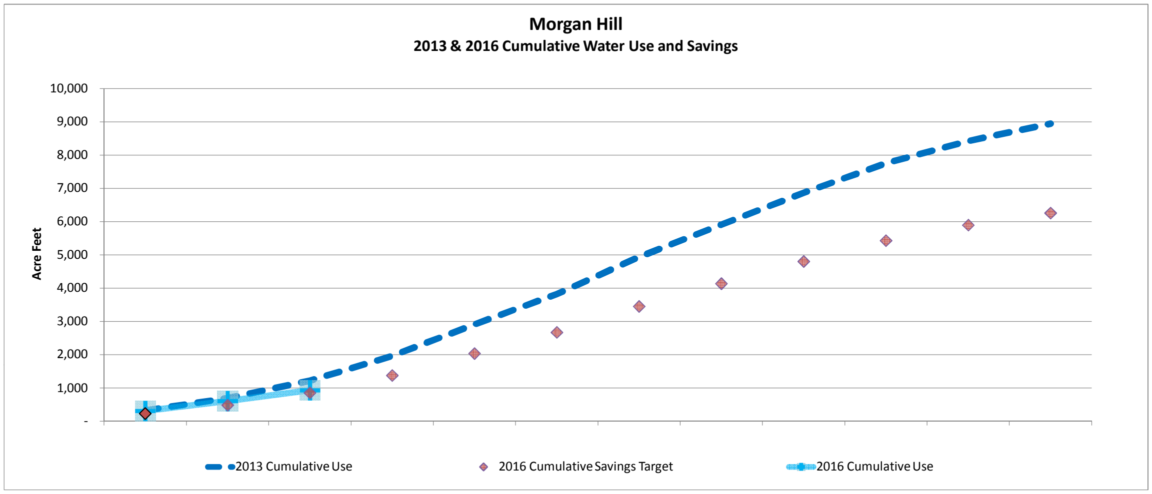
Morgan Hill, City

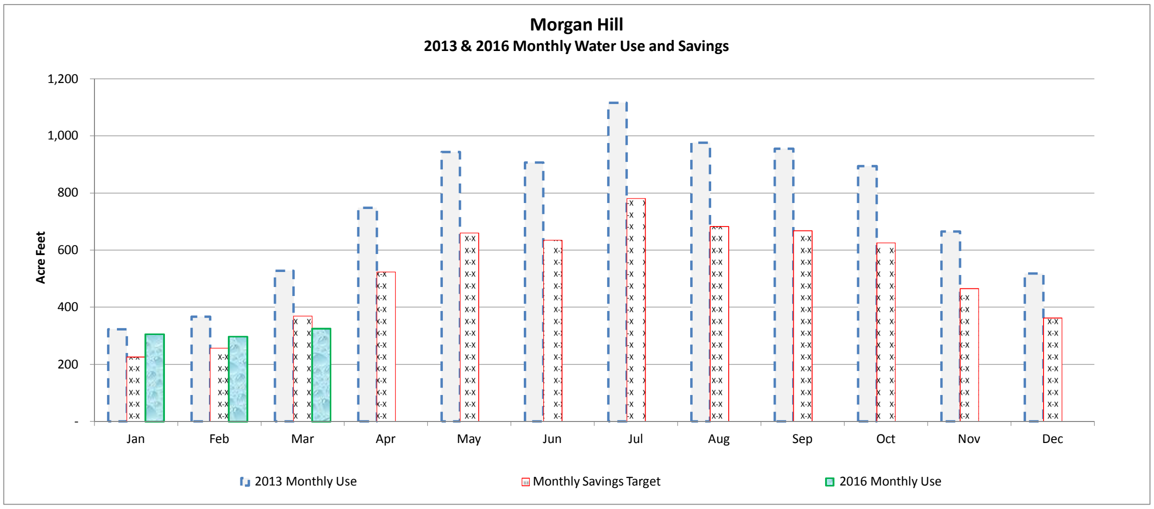
2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Other	2013 Monthly Use
Jan	323.0	-	-	-	323.0
Feb	367.0	-	-	-	367.0
Mar	528.0	-	-	-	528.0
Apr	748.0	-	-	-	748.0
May	943.0	-	-	-	943.0
Jun	907.0	-	-	-	907.0
Jul	1,116.0	-	-	-	1,116.0
Aug	976.0	-	-	-	976.0
Sep	955.0	-	-	-	955.0
Oct	894.0	-	-	-	894.0
Nov	665.0	-	-	-	665.0
Dec	518.0	-	-	-	518.0
Jan to Current Month Totals	**1,218.0**	**-**	**-**		**1,218.0**
January to December Total	**8,940.0**	**-**	**-**	**-**	**8,940.0**

2016	Groundwater	Treated Water	SFPUC	Other	2016 Monthly Use
Jan	306.0	-	-	-	306.0
Feb	297.5	-	-	-	297.5
Mar	325.4	-	-	-	325.4
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**928.9**	**-**	**-**	**-**	**928.9**
%Savings by Source of Supply	**24%**	**-**	**-**	**-**	**24%**

Cumulative % Savings Jan to December (+) = savings
5%
13%
24%
-
-
-
-
-
-
-
-
-





Notes

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Cumulative % Savings shows the target savings for all months combined at that period in time.

Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.

N/A = Not Applicable

\- Not Available

Santa Clara Valley Water District

As of 4/19/2016

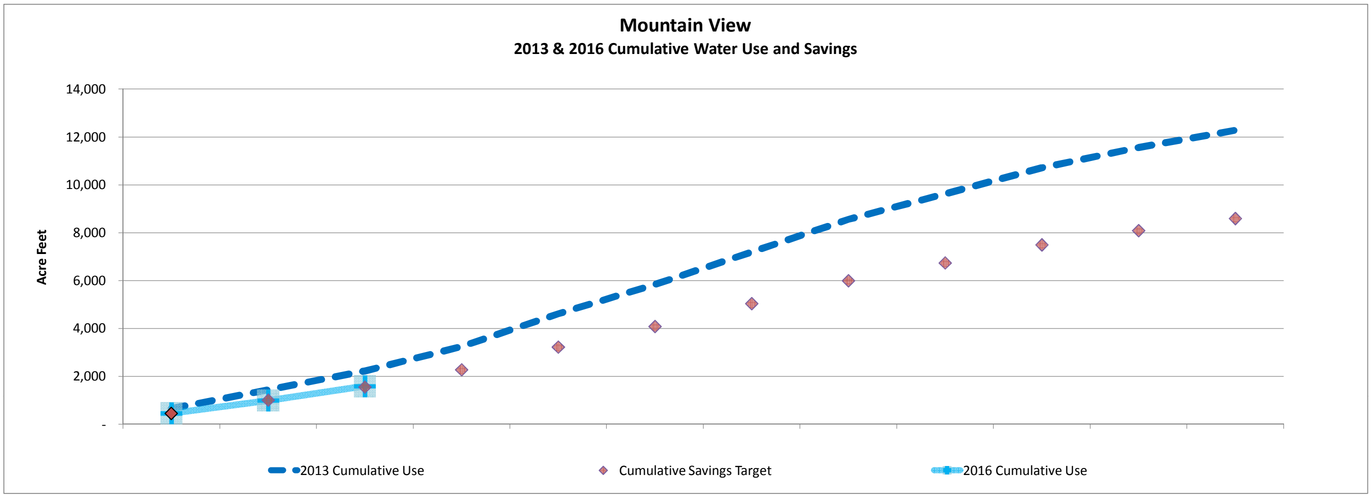
Mt. View

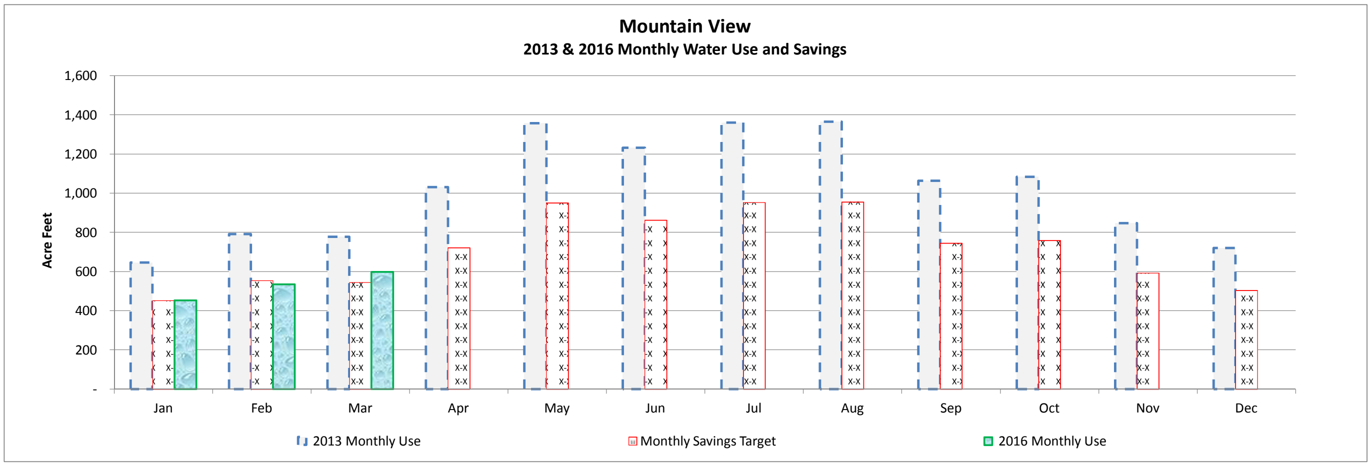
2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Surface Water	2013 Monthly Use
Jan	28.0	54.0	564.0	-	646.0
Feb	28.0	63.0	700.0	-	791.0
Mar	38.0	85.0	655.0	-	778.0
Apr	35.0	110.0	886.0	-	1,031.0
May	40.0	142.0	1,176.0	-	1,358.0
Jun	41.0	142.0	1,049.0	-	1,232.0
Jul	29.0	155.0	1,177.0	-	1,361.0
Aug	30.0	152.0	1,183.0	-	1,365.0
Sep	24.0	134.0	906.0	-	1,064.0
Oct	35.0	121.0	928.0	-	1,084.0
Nov	31.0	92.0	724.0	-	847.0
Dec	30.0	79.0	611.0	-	720.0
Jan to Current Month Totals	**94.0**	**202.0**	**1,919.0**	**-**	**2,215.0**
January to December Total	**389.0**	**1,329.0**	**10,559.0**	**-**	**12,277.0**

2016	Groundwater	Treated Water	SFPUC	Surface Water	2016 Monthly Use
Jan	5.6	32.7	415.7	-	454.0
Feb	5.6	47.4	482.3	-	535.4
Mar	7.0	50.7	540.4	-	598.1
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**18.2**	**130.8**	**1,438.5**	**-**	**1,587.5**
%Savings by Source of Supply	**81%**	**35%**	**25%**		**28%**

Cumulative % Savings Jan to December (+) = savings
30%
31%
28%
-
-
-
-
-
-
-
-
-





Notes

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Cumulative % Savings shows the target savings for all months combined at that period in time.

Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.

N/A = Not Applicable

- Not Available

SFPUC - San Francisco Public Utilities Commission Water Sales. SFPUC 2014 Drought response is a call for voluntary 10% savings

Santa Clara Valley Water District

As of 4/18/2016

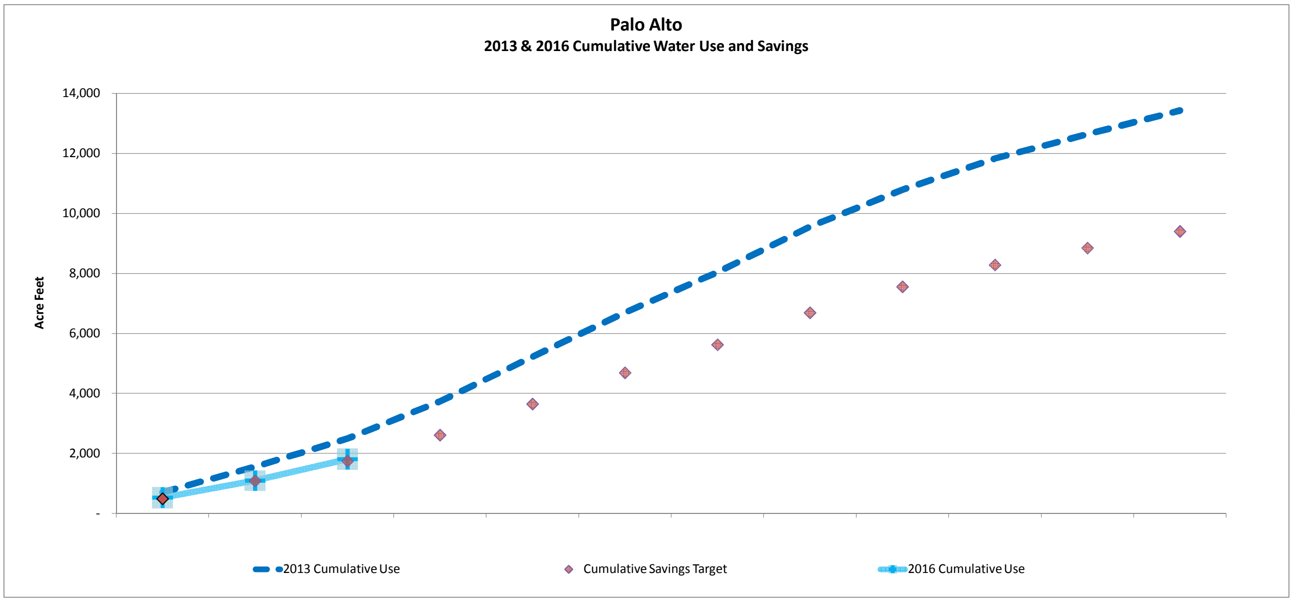
Palo Alto

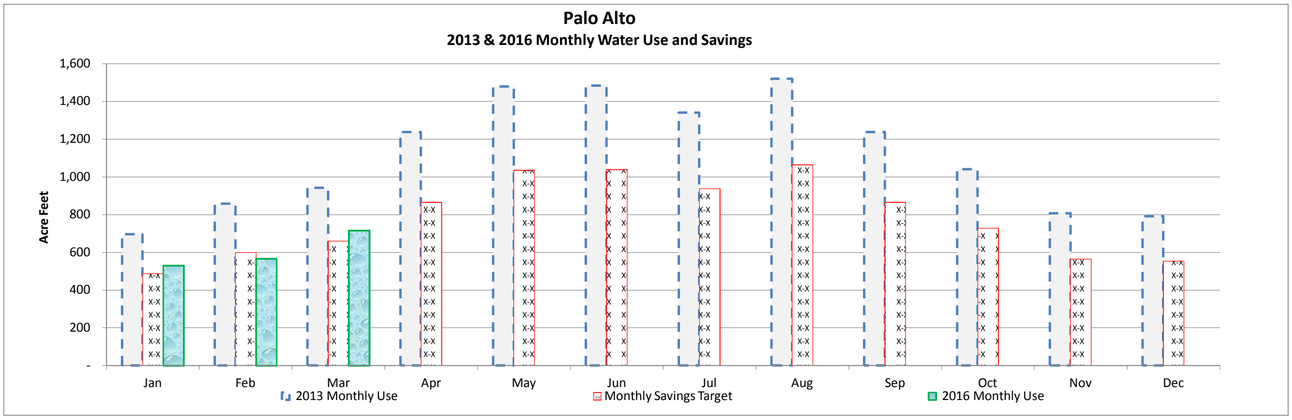
2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Other	2013 Monthly Use
Jan	-	-	696.0	-	696.0
Feb	-	-	857.5	-	857.5
Mar	-	-	943.0	-	943.0
Apr	-	-	1,237.3	-	1,237.3
May	-	-	1,479.7	-	1,479.7
Jun	-	-	1,484.3	-	1,484.3
Jul	-	-	1,340.2	-	1,340.2
Aug	-	-	1,520.7	-	1,520.7
Sep	-	-	1,237.3	-	1,237.3
Oct	-	-	1,041.1	-	1,041.1
Nov	-	-	807.9	-	807.9
Dec	-	-	791.2	-	791.2
Jan to Current Month Totals	**-**	**-**	**2,496.4**		**2,496.4**
January to December Total	**-**	**-**	**13,435.9**	**-**	**13,435.9**

2016	Groundwater	Treated Water	SFPUC	Other	2016 Monthly Use
Jan	-	-	529.6	-	529.6
Feb	-	-	566.3	-	566.3
Mar	-	-	716.1	-	716.1
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**-**	**-**	**1,811.9**	**-**	**1,811.9**
%Savings by Source of Supply			**27%**		**27%**

Cumulative % Savings Jan to December
(+) = savings
24%
29%
27%
-
-
-
-
-
-
-
-
-





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N/A = Not Applicable

- Not Available

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Santa Clara Valley Water District

As of 4/18/2016

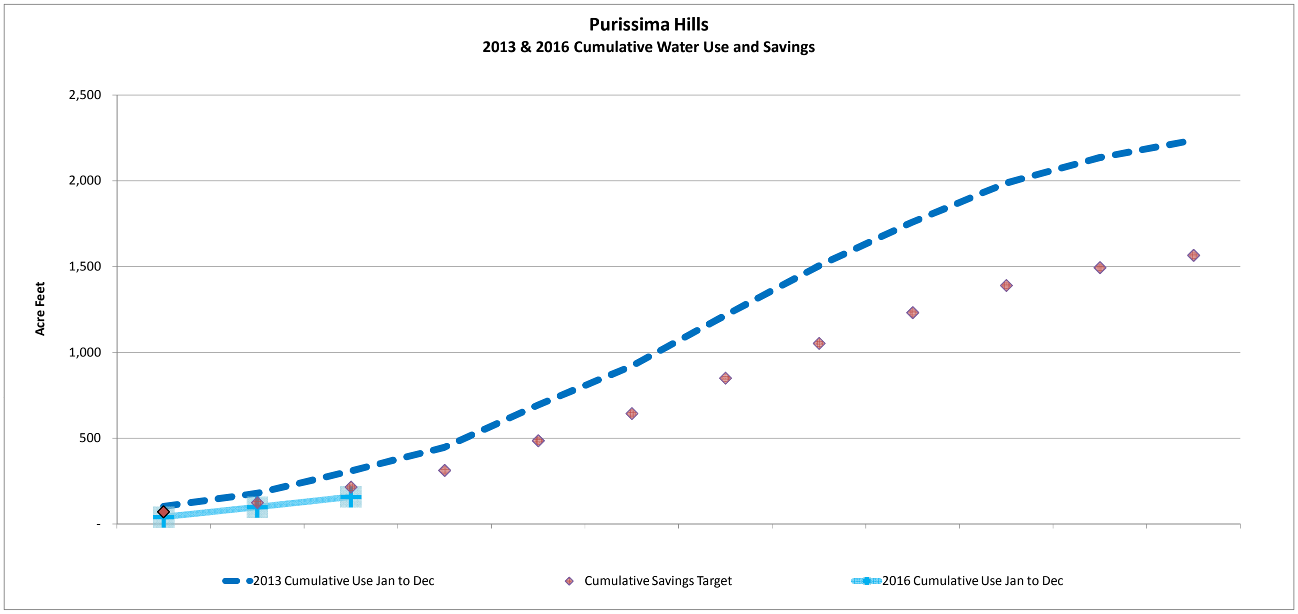
Purissima Hills

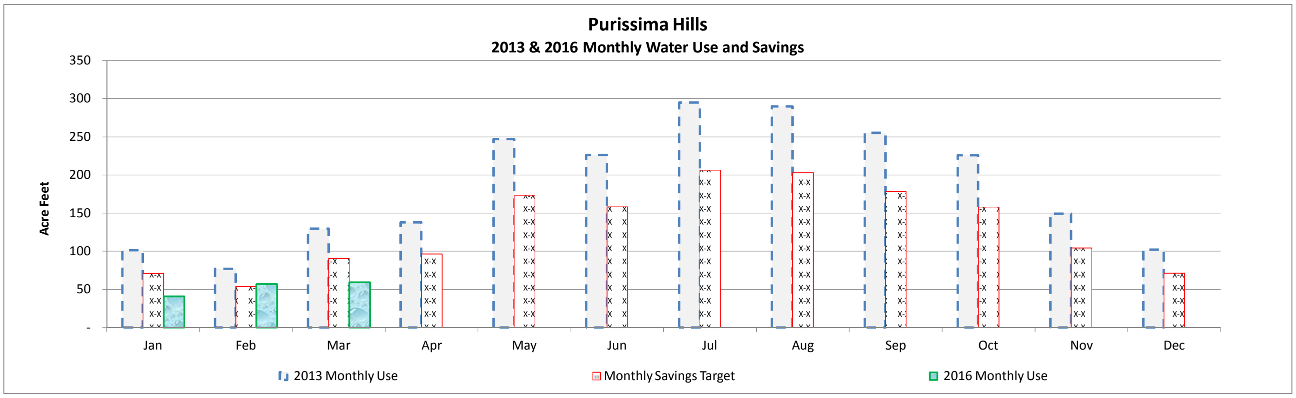
2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Other	2013 Monthly Use
Jan	-	-	101.5	-	101.5
Feb	-	-	77.0	-	77.0
Mar	-	-	129.6	-	129.6
Apr	-	-	138.0	-	138.0
May	-	-	247.3	-	247.3
Jun	-	-	226.4	-	226.4
Jul	-	-	295.0	-	295.0
Aug	-	-	290.0	-	290.0
Sep	-	-	255.2	-	255.2
Oct	-	-	225.9	-	225.9
Nov	-	-	149.3	-	149.3
Dec	-	-	102.2	-	102.2
Jan to Current Month Totals	**-**	**-**	**308.2**		**308.2**
January to December Total	**-**	**-**	**2,237.5**	**-**	**2,237.5**

2016	Groundwater	Treated Water	SFPUC	Other	2016 Monthly Use
Jan	-	-	41.2	-	41.2
Feb	-	-	57.1	-	57.1
Mar	-	-	59.6	-	59.6
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**-**	**-**	**157.8**	**-**	**157.8**
%Savings by Source of Supply			**49%**		**49%**

Cumulative % Savings Jan to December
(+) = savings
59%
45%
49%
-
-
-
-
-
-
-
-
-





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N/A = Not Applicable

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2013 Data was changed after change in meter reading schedule (updated March 2016)

Santa Clara Valley Water District

As of 4/18/2016

Santa Clara (City)

2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Other	2013 Monthly Use
Jan	802.0	287.0	207.0	-	1,296.0
Feb	735.0	370.0	219.0	-	1,324.0
Mar	951.0	428.0	199.0	-	1,578.0
Apr	1,059.0	434.0	224.0	-	1,717.0
May	1,378.0	492.0	226.0	-	2,096.0
Jun	1,520.0	467.0	180.0	-	2,167.0
Jul	1,545.0	454.0	204.0	-	2,203.0
Aug	1,688.0	450.0	217.0	-	2,355.0
Sep	1,233.0	442.0	183.0	-	1,858.0
Oct	1,301.0	428.0	234.0	-	1,963.0
Nov	1,062.0	356.0	194.0	-	1,612.0
Dec	933.0	342.0	173.0	-	1,448.0
January to Current Month Totals	**2,488.0**	**1,085.0**	**625.0**	**-**	**4,198.0**
January to December Total	**14,207.0**	**4,950.0**	**2,460.0**	**-**	**21,617.0**

2016	Groundwater	Treated Water	SFPUC	Other	2016 Monthly Use
Jan	623.2	232.2	192.1	-	1,047.5
Feb	660.9	295.5	205.7	-	1,162.1
Mar	737.1	270.8	223.8	-	1,231.7
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
January to Current Month Totals	**2,021.2**	**798.5**	**621.6**	**-**	**3,441.3**
%Savings by Source of Supply	**19%**	**26%**	**1%**	**-**	**18%**

Cumulative % Savings Jan to December
(+) = savings
19%
16%
18%
-
-
-
-
-
-
-
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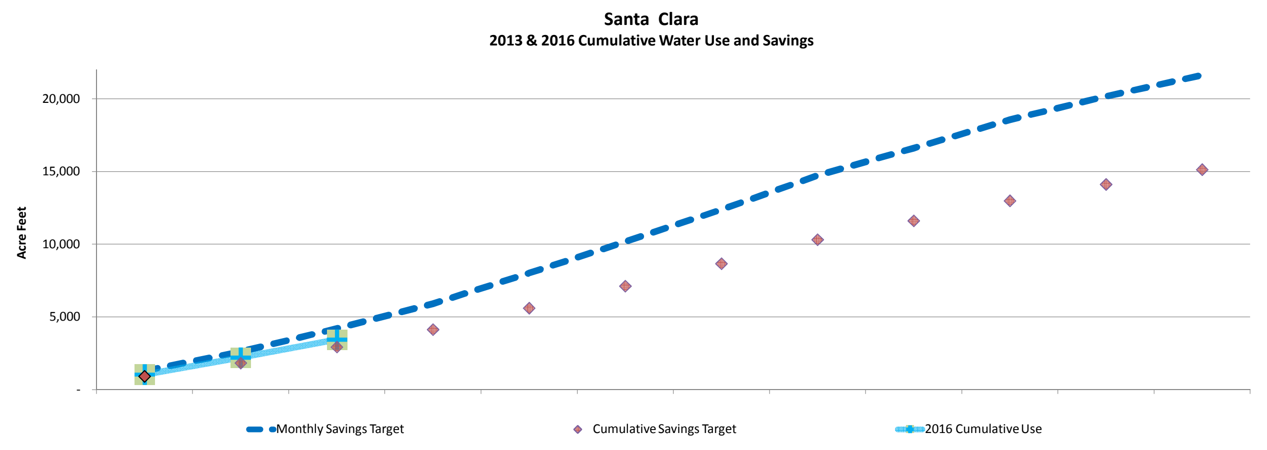

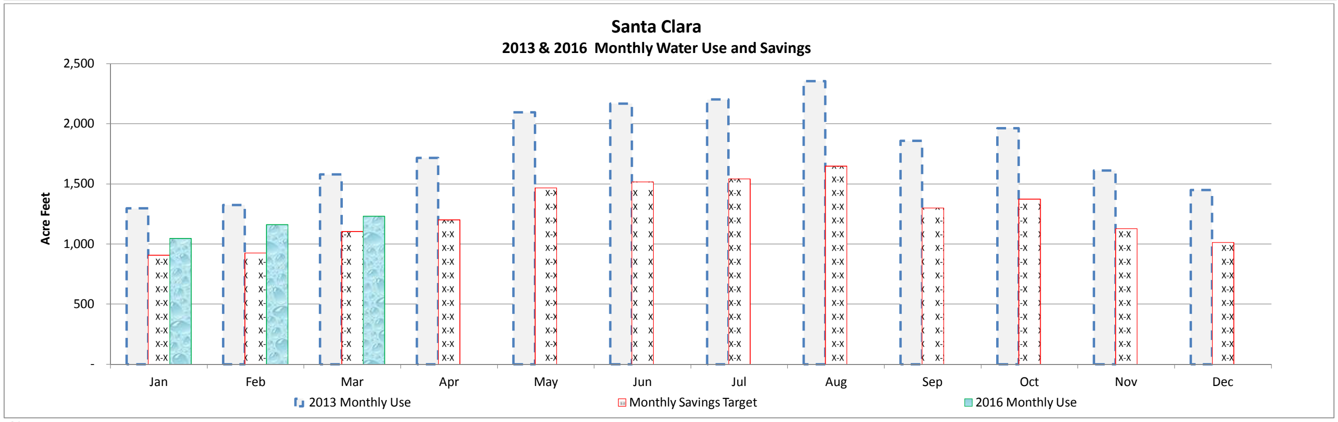

Notes

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Cumulative % Savings shows the target savings for all months combined at that period in time.

Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.

January to March 2015 savings targets at 20% reductions compared to the same period in 2013, and the remaining months are at the March 24, 2015 call for 30% savings.

N/A = Not Applicable

- Not Available

SFPUC - San Francisco Public Utilities Commission Water Sales. SFPUC 2014 Drought response is a call for voluntary 10% savings

Santa Clara Valley Water District

As of 4/18/2016

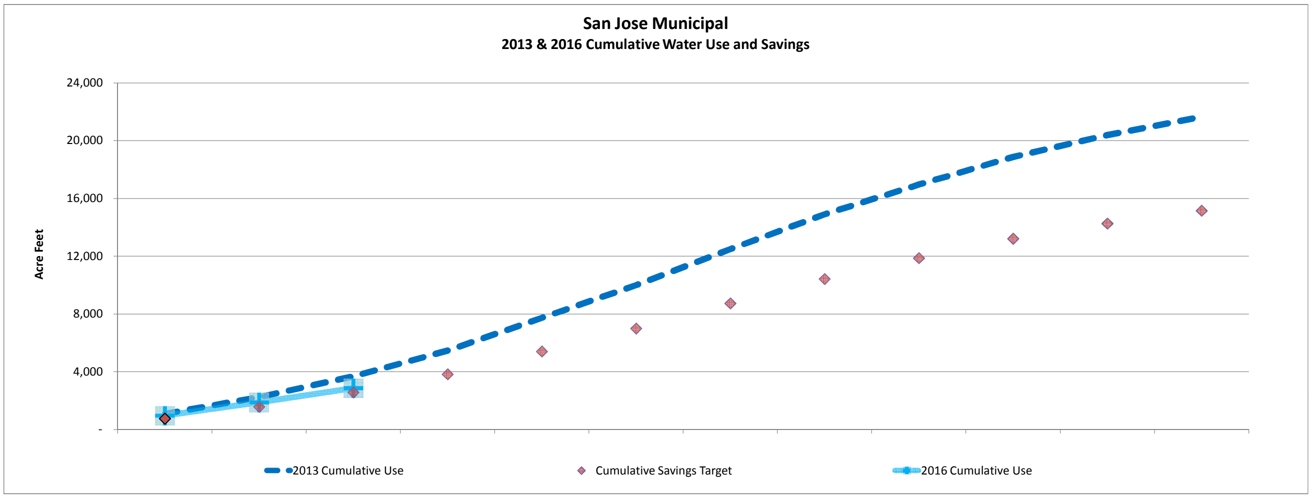
San Jose Municipal

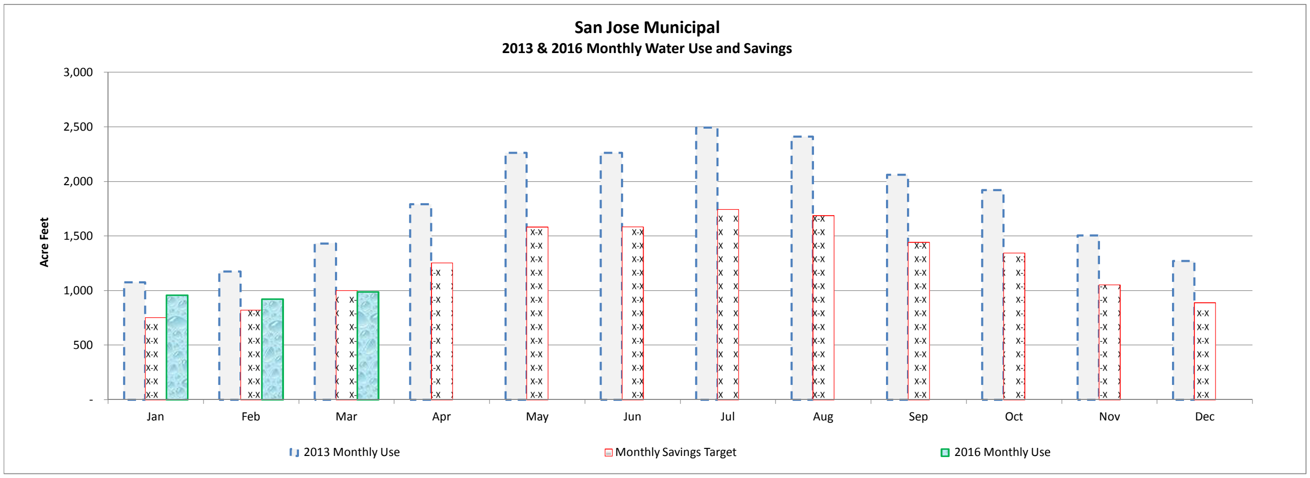
2013 and 2016 Water Use Compared to Target

2013	Ground Water Zone 2	Ground Water Zone 5	Treated Water	SFPUC	2013 Monthly Use
Jan	35.1	25.5	728.0	286.0	1,074.6
Feb	37.2	21.8	762.0	354.0	1,175.0
Mar	46.7	25.0	1,020.0	339.0	1,430.7
Apr	67.8	30.9	1,278.0	414.0	1,790.7
May	39.9	27.9	1,653.0	540.0	2,260.8
Jun	45.2	33.2	1,691.0	493.0	2,262.4
Jul	47.3	31.4	1,854.0	560.0	2,492.7
Aug	50.8	36.5	1,750.0	574.0	2,411.3
Sep	33.6	31.3	1,530.0	466.0	2,060.9
Oct	36.3	44.0	1,380.0	461.0	1,921.3
Nov	33.4	52.0	1,039.0	379.0	1,503.4
Dec	26.4	32.5	885.0	326.0	1,269.9
Jan to Current Month Totals	**119.0**	**72.3**	**2,510.0**	**979.0**	**3,680.3**
January to December Total	**499.7**	**392.0**	**15,570.0**	**5,192.0**	**21,653.7**

2016	Ground Water Zone 2	Ground Water Zone 5	Treated Water	SFPUC	2016 Monthly Use
Jan	35.6	25.0	598.0	299.8	958.4
Feb	17.0	22.4	574.6	307.9	921.9
Mar	18.2	24.2	605.0	340.5	987.9
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**70.8**	**71.6**	**1,777.6**	**948.2**	**2,868.2**
%Savings by Source of Supply	**41%**	**1%**	**29%**	**3%**	**22%**

Cumulative % Savings Jan to December
(+) = savings
11%
16%
22%
-
-
-
-
-
-
-
-
-


San Jose Municipal
2013 & 2016 Cumulative Water Use and Savings


San Jose Municipal
2013 & 2016 Monthly Water Use and Savings

Notes

Current monthly water use data is preliminary and subject to change.

Percent savings are shown in positive values where savings have been made and negative percent values where water use is higher than the base year period (2013)

Cumulative % Savings shows the target savings for all months combined at that period in time.

Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.

N/A = Not Applicable

- Not Available

SFPUC - San Francisco Public Utilities Commission Water Sales. SFPUC 2014 Drought response is a call for voluntary 10% savings

Santa Clara Valley Water District

As of 4/18/2016

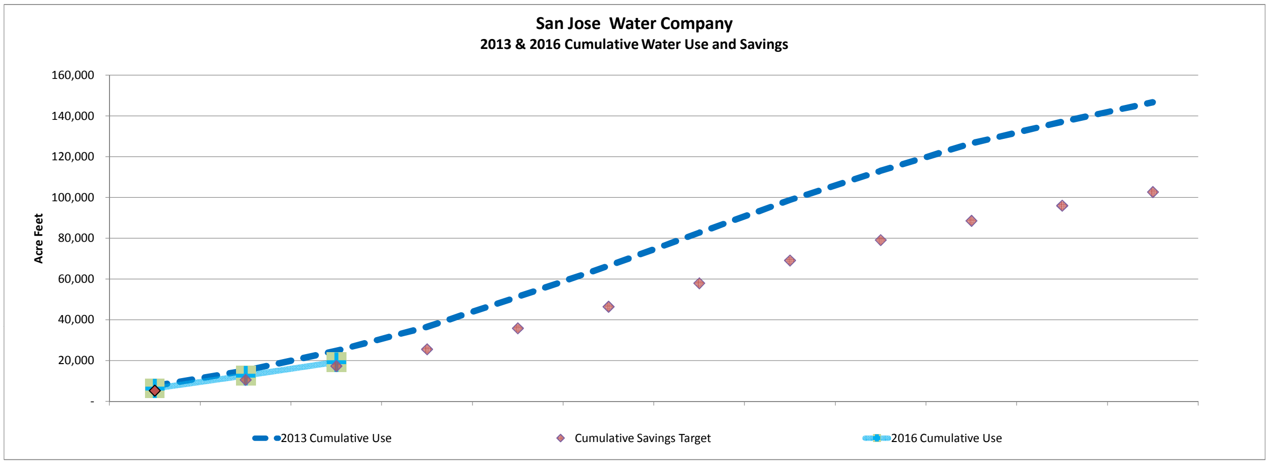
San Jose Water Company

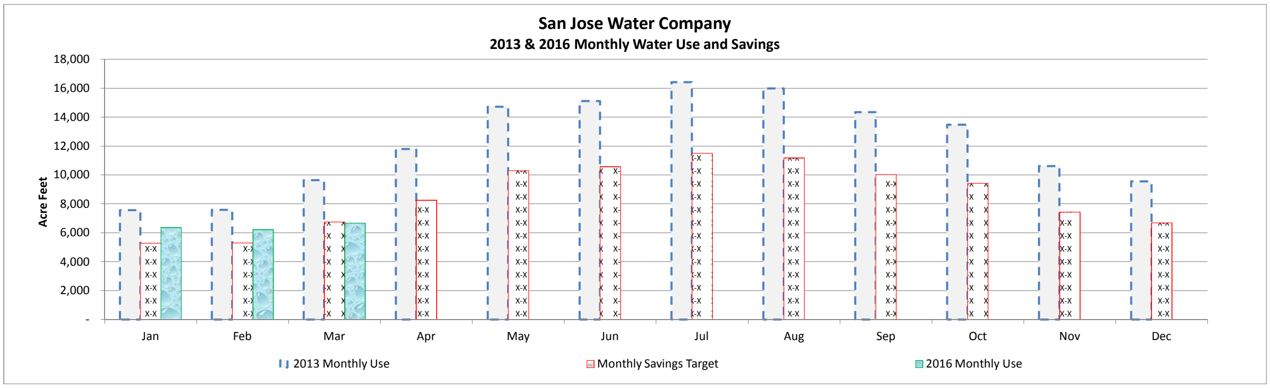
2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Surface Water	2013 Monthly Use
Jan	1,731.0	4,016.1	-	1,807.1	7,554.2
Feb	1,865.6	4,328.1	-	1,384.8	7,578.6
Mar	3,807.7	5,241.9	-	594.9	9,644.4
Apr	4,293.0	7,082.4	-	422.2	11,797.6
May	5,375.9	9,033.4	-	298.6	14,708.0
Jun	5,643.2	8,959.1	-	516.2	15,118.5
Jul	7,198.0	8,610.9	-	616.3	16,425.2
Aug	6,693.0	8,694.2	-	584.1	15,971.2
Sep	5,451.9	8,352.7	-	530.6	14,335.2
Oct	5,575.0	7,394.2	-	501.5	13,470.6
Nov	4,971.4	5,323.4	-	326.0	10,620.8
Dec	5,145.5	4,205.5	-	202.8	9,553.7
Jan to Current Month Totals	**7,404.3**	**13,586.1**	**-**	**3,786.8**	**24,777.2**
January to December Total	**57,751.1**	**81,242.0**	**-**	**7,785.0**	**146,778.1**

2016	Groundwater	Treated Water	SFPUC	Surface Water	2016 Monthly Use
Jan	2,785.4	3,099.5	-	489.1	6,373.9
Feb	2,081.5	3,193.1	-	951.1	6,225.7
Mar	2,348.6	3,035.0	-	1,282.3	6,665.9
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**7,215.4**	**9,327.6**	**-**	**2,722.5**	**19,265.5**
%Savings by Source of Supply	**3%**	**31%**	**-**	**28%**	**22%**

Cumulative % Savings Jan to December
(+) = savings
16%
17%
22%
-
-
-
-
-
-
-
-
-





Notes

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Percent savings are shown in positive values where savings have been made and negative percent values where water use is higher than the base year period (2013)

Cumulative % Savings shows the target savings for all months combined at that period in time.

N/A = Not Applicable

\- Not Available

As of 4/18/2016

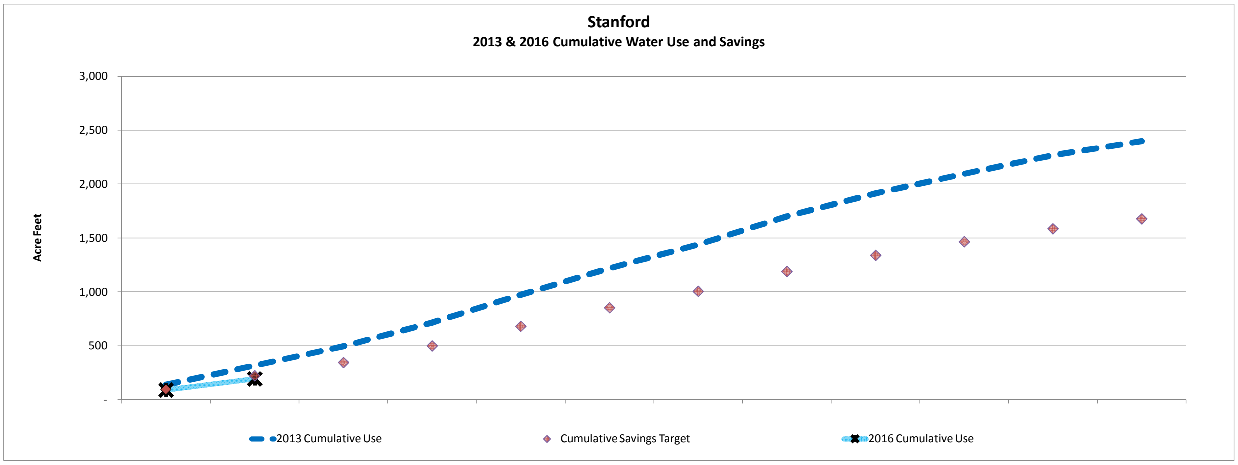
Stanford University

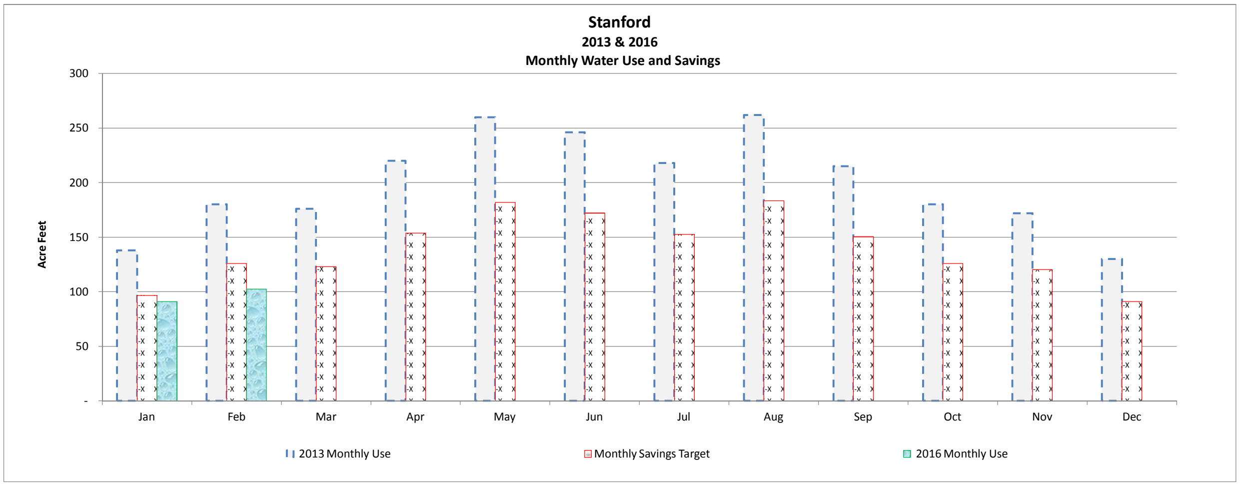
2013 and 2016 Water Use Compared to Target

2013	- Groundwater	Treated Water	SFPUC	Other	2013 Monthly Use
Jan	-	-	138.0		138.0
Feb	-	-	180.0		180.0
Mar	-	-	176.0		176.0
Apr	-	-	220.0		220.0
May	-	-	260.0		260.0
Jun	-	-	246.0		246.0
Jul	-	-	218.0		218.0
Aug	-	-	262.0		262.0
Sep	-	-	215.0		215.0
Oct	-	-	180.0		180.0
Nov	-	-	172.0		172.0
Dec	-	-	130.0		130.0
Jan to Current Month	**-**	**-**	**318.0**	**-**	**318.0**
January to December Total	**-**	**-**	**2,397.0**	**-**	**2,397.0**

2016	Groundwater	Treated Water	SFPUC	Other	2016 Monthly Use
Jan	-	-	91.0	-	91.0
Feb	-	-	102.4	-	102.4
Mar*	-	-	-	-	-
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month	-	-	**193.5**	**-**	**193.5**
%Savings by Source of Supply			**39%**		**39%**

Cumulative % Savings Jan to December (+) = savings
34%
39%
-
-
-
-
-
-
-
-
-
-





Notes

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Percent savings are shown in positive values where savings have been made and negative percent values where water use is higher than the base year period (2013)

Cumulative % Savings shows the target savings for all months combined at that period in time.

Recycled water not included in monthly analysis and will be analyzed separately. It is not included in the water savings target.

Potable Use only reported. SFPUC data does not match SFPUC billing records due to wheeling water to Stanford Hospital, which is in the Palo Alto service area

Variations in month to month savings: Stanford's billing cycles vary on a monthly and yearly basis, and are not consistent with the amount of calendar days in each month.

When normalized for number of days in billing cycles, decreased, Stanford reports Domestic Water Savings of above the percent saved in this report

* water use values are not available as of time of report printing

N/A = Not Applicable

\- Not Available

Sunnyvale , City

2013 and 2016 Water Use Compared to Target

2013	Groundwater	Treated Water	SFPUC	Surface Water	2013 Monthly Use
Jan	11.0	49.0	1,052.0	-	1,112.0
Feb	10.0	531.0	754.0	-	1,295.0
Mar	8.0	770.0	689.0	-	1,467.0
Apr	10.0	898.0	898.0	-	1,806.0
May	8.0	1,101.0	1,195.0	-	2,304.0
Jun	8.0	1,270.0	879.0	-	2,157.0
Jul	13.0	1,146.0	1,245.0	-	2,404.0
Aug	9.0	1,055.0	1,242.0	-	2,306.0
Sep	11.0	983.0	965.0	-	1,959.0
Oct	13.0	993.0	884.0	-	1,890.0
Nov	11.0	842.0	704.0	-	1,557.0
Dec	11.0	780.0	523.0	-	1,314.0
Jan to Current Month Totals	**29.0**	**1,350.0**	**2,495.0**	**-**	**3,874.0**
January to December Total	**123.0**	**10,418.0**	**11,030.0**	**-**	**21,571.0**

2016	Groundwater	Treated Water	SFPUC	Surface Water	2016 Monthly Use
Jan	9.3	385.2	566.3	-	960.9
Feb	8.6	472.3	529.0	-	1,009.9
Mar	14.1	419.4	673.5	-	1,106.9
Apr	-	-	-	-	-
May	-	-	-	-	-
Jun	-	-	-	-	-
Jul	-	-	-	-	-
Aug	-	-	-	-	-
Sep	-	-	-	-	-
Oct	-	-	-	-	-
Nov	-	-	-	-	-
Dec	-	-	-	-	-
Jan to Current Month Totals	**32.0**	**1,276.9**	**1,768.8**	**-**	**3,077.7**
%Savings by Source of Supply	**-10%**	**5%**	**29%**		**21%**

Cumulative % Savings Jan to Dec based on 2013
(+) = savings
14%
18%
21%
-
-
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-
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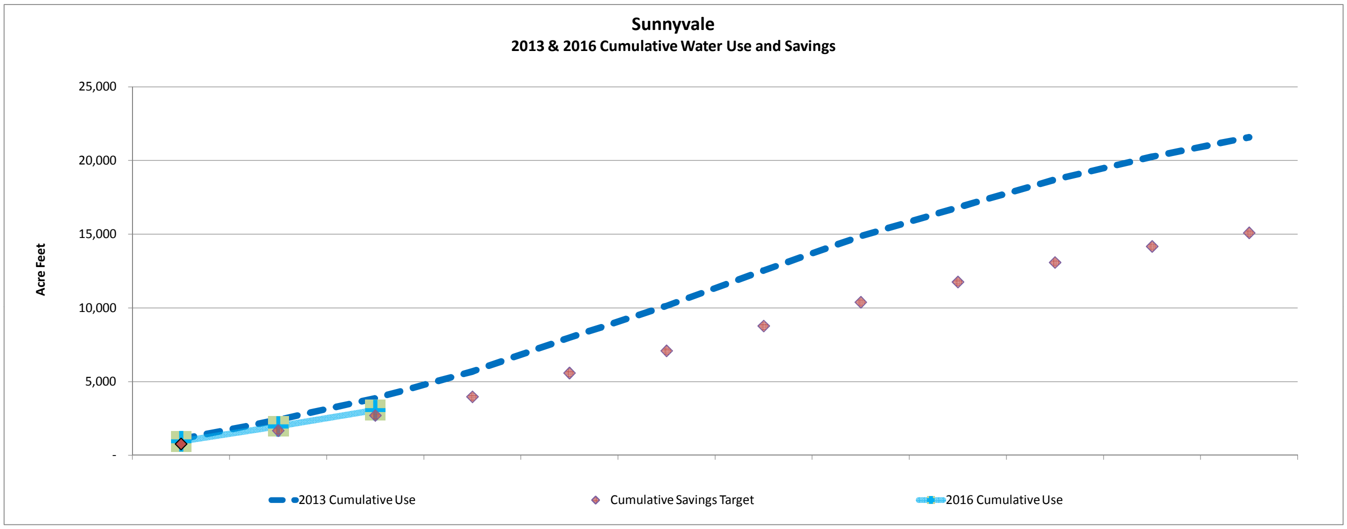
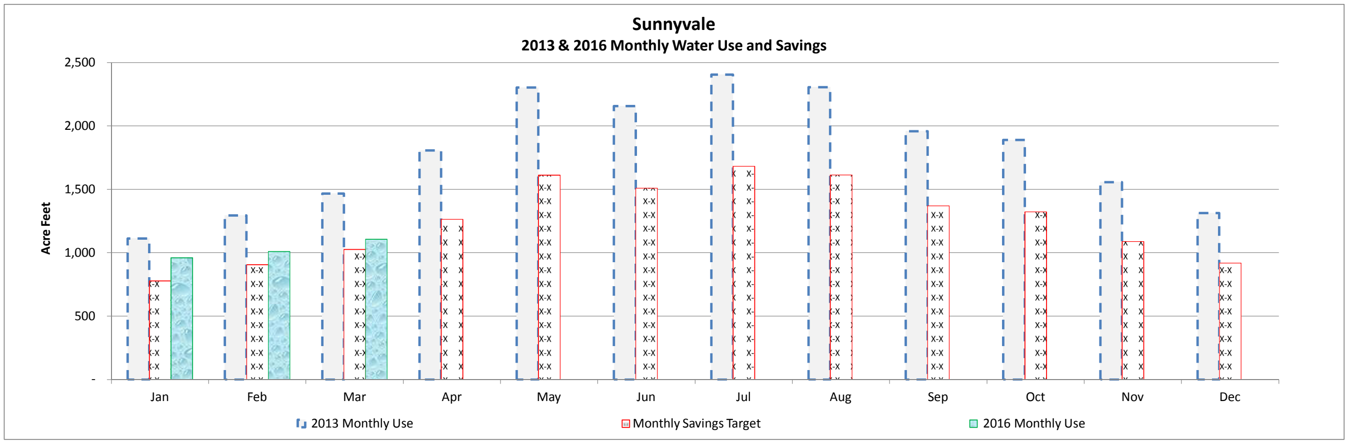
-





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N/A = Not Applicable

- Not Available

SFPUC - San Francisco Public Utilities Commission Water Sales. SFPUC 2014 Drought response is a call for voluntary 10% savings

Santa Clara Valley Water District

As of 4/18/2016

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Section 3. Water Conservation Measures

This section provides an overview of the water conservation measures taken by the district, municipalities and water retailers.

A. Santa Clara Valley Water District Measures

Since the district's call for water use reductions, the district has increased its water conservation outreach and education, and increased rebates for many of its programs, including:

- Landscape conversion rebate program: rebates were increased to $2 per square foot
- Irrigation hardware upgrades rebate program: several irrigation hardware rebates were increased.
- Graywater laundry to landscape rebate program: up to $200 per residential site for properly connecting a clothes washer to a graywater irrigation system.
- Commercial rebate programs: several rebates for commercial facilities were increased, including the rebate for connectionless food steamers, commercial high-efficiency clothes washers and the custom/measured rebate

In addition, the district recently initiated a Safe, Clean Water and Natural Flood Protection Program to provide research grants to study and pilot-test new and innovative water conservation programs and efficient technologies. The program will provide $1 million over a 10 year period.

To date, 17.6 million incurred for drought response activities. In addition, the board and the CEO have authorized an additional $27.3 million in budget adjustments. The breakdown is as follows:

- Conservation Programs - $16.4 million
- Outreach - $2.4 million
- Imported Water - $8.5 million for purchased water and reverse flow consultant.

B. Water Retailer Measures

Local water retailers responded to the district's 2014 call for savings in various ways. Several retailers called for 20 percent reductions and activated or adopted water use restrictions. Most water retailers took additional action since August 2014 to respond to the State Board's Emergency Regulations that were adopted in July 2014. Nearly every water retailer increased their outreach and education efforts. In addition, water retailers implemented additional actions in response to the Governor's April 1, 2015, Executive Order and the State Board's expanded drought-related emergency regulations adopted March 17, 2015. Two summits, one with the retailers, one with elected officials, have been held to facilitate increased water conservation and water use saving efforts and increase coordination to meet the 30 percent reduction target. A common theme between the two summits was that messaging and policy development needs to be consistent and coordinated. See Table 9 on next page for a summary of actions taken to date.

TABLE 9: WATER RETAILER WATER USE REDUCTION MEASURES

Water Retailer	Retailer Call for Water Use Reduction	Retailer Water Use Restrictions
California Water Service	32 percent	Enacted Schedule 14.1 restrictions and allocations
Gilroy	30 percent	Permanent restrictions plus Stage 2
Great Oaks	30 percent	Enacted Schedule 14.1 restrictions and allocations
Milpitas	30 percent	Permanent restrictions plus additional measure, including allocations. Urgency Drought Ordinance adopted and in force.
Morgan Hill	30 percent	Permanent restrictions plus Level 3
Mountain View	16 percent	Permanent restrictions plus Stage 2
Palo Alto	24 percent	Palo Alto has implemented all measures included in Stage II of its Water Shortage Contingency Plan
Purissima Hills Water	2-Day per Week Watering Schedule	Permanent restrictions
San Jose Municipal Water	30 percent	Permanent restrictions plus Stage 3
San Jose Water Company	30 percent	Enacted Schedule 14.1 restrictions and allocations
Santa Clara	30 percent	Permanent restrictions plus Plan 3
Stanford	2-Day per Week Watering Schedule	N/A
Sunnyvale	30 percent	Permanent restrictions plus Stage 1

C. Other Municipality Measures (non retailer cities and the County)

Some of the cities or towns in Santa Clara County do not have a municipal water system. They are served by investor owned water retail agencies. However, many of them are moving forward with their own actions to influence water use reductions in their communities.

TABLE 10: MUNICIPALITY NON-RETAILER ACTIONS

City (non municipal water retailer)	Action	Outreach
Campbell, City of	Drought Ordinance updated to include enforcement provisions and drought stages	Water saving tips on website and in city newsletter.
Saratoga, City of	Drought Resolution calls for 30 percent. Updated Water Efficient Landscape Ordinance.	Water saving tips on website, with links to SJWC and SCVWD water conservation and rebate programs.
Los Altos, City of	Drought Resolution calls for 32 percent.	Resolution includes voluntary measures consistent with model ordinance
Los Altos Hills, Town of	Water efficient landscaping regulations in place. Environmental Initiatives Committee reviewing potential additional water saving measures.	Support SCVWD and retailer efforts. Water conservation information on Town website.
Los Gatos, Town of	Drought Ordinance adopted and in force, calls for 25 percent.	Water saving tips and information on SCVWD water conservation rebate programs on website.
Cupertino	Drought Ordinance adopted and in force. Resolution calls for 30 percent.	Drought Resources page on city website, banners with watering schedule and drought messages in City parks, drought signs on City lawns. Matching turf removal rebate.
Monte Sereno, City of	Water conservation and landscaping regulations in place.	City Council received information detailing SJW’s Schedule 14.1 restrictions.

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Section 4. Drought Response Strategies

The district's comprehensive drought response is being implemented through fifteen strategies grouped into four general categories: (A) water supply and operations; (B) water use reduction; (C) drought response opportunities; and (D) administrative and financial management.

A. Water Supply and Operations

1. Secure imported water supplies.

   This strategy includes working with state and federal project operators: California Department of Water Resources (DWR) and U.S. Bureau of Reclamation (Reclamation), and contractors of the State Water Project (SWP) and Central Valley Project (CVP), to secure the district's 2015 contract carryover supplies and 2016 contract allocations. It also includes supporting initiatives to control Delta salinity; providing for return of water from the Semitropic Water Bank; determining the availability of supplemental water transfers and imported water carryover for 2016; and coordinating with San Francisco Public Utilities Commission (SFPUC) on drought impacts to the Hetch-Hetchy Project.

2. Manage surface water and groundwater supplies.

   To maximize water supply reliability and protect groundwater, this strategy optimizes distribution of limited local and imported supplies, including deliveries to the three water treatment plants, operation of district reservoirs and the groundwater recharge system, and deliveries to untreated surface water users. Given current water supply conditions, ongoing communication is required with regulatory agencies and other stakeholders regarding changing conditions in reservoirs, creeks and recharge ponds, as well as working with untreated surface water customers to establish alternate sources of supply.

3. Optimize treated water quality and availability.

   This strategy focuses on optimizing treatment plant operations and source water supplies to meet drinking water quality and reliability objectives, in coordination with the district's retail treated water contractors. It includes continuing to meet treated water quality objectives despite drought-induced water quality conditions in the Delta this year. This strategy also includes working with SFPUC to use the Hetch-Hetchy Intertie when necessary to meet treated water schedules.

B. Water Use Reduction

4. Reduce 2016 water use by 30 percent compared to 2013 water use

   This strategy includes promoting short-term and long-term actions to meet the 30% water use reduction target called for by the Board on March 24, 2015 and extended on November 24, 2015, as well as tracking progress towards meeting that target. Activities include promoting the district's water conservation programs; coordinating with retail water agencies, municipalities and the County of Santa Clara on drought response ordinances and programs; and implementing a public outreach and education campaign.

5. Ensure that district facilities set a model for water conservation.

   Many water conservation measures have been implemented at district facilities in past years, including low flow toilets, dual flush valves in high use areas, low flow aerators on faucets in restrooms and break areas, low flow devices in showers, drought tolerant landscaping and/or native vegetation, and Calsense intelligent irrigation controllers for landscaping. In 2013, the district reduced water use by 11% (10.8 million gallons) compared to 2012 (12.1 million gallons). In 2015, district facilities used 43 percent less water than in 2013.

6. Support customers and key stakeholders to minimize adverse drought impacts.

   This strategy includes providing assistance to retail water agencies for their outreach, operations, and conservation programs. The district meets regularly with the Water Retailers and subcommittees (Water Supply, Treated Water, Water Quality, Groundwater, Conservation, Communication and Ad Hoc Drought Response Subcommittees). Assistance is also being provided to surface water customers, agricultural water users, municipalities, and others as they implement drought response. The Landscape Committee is convened to discuss drought response as it affects landscape businesses. This strategy includes tracking and reporting customer and stakeholder requests.

C. Drought Response Opportunities

7. Leverage community awareness to advance long-term conservation measures.

   This strategy includes measures to increase participation in the district's long-term water conservation programs. It also identifies, evaluates and supports new innovative conservation measures, including Safe Clean Water (SCW) Water Conservation Research Grant efforts, which are expected to be implemented in calendar year 2016. Staff is also investigating opportunities for advancing sustainable, long-term savings through land use initiatives, where feasible.

8. Accelerate recycled water program development and implementation.

   The current drought has raised interest in expediting implementation of both non-potable and potable reuse components of the district’s long-term water supply plans by existing and potential recycled water partners, legislators, water users and others. Staff is identifying and preparing plans for high-priority recycled/purified water projects (up to 45,000 acre-feet per year) to help alleviate water supply shortages if the current drought continues; pursuing regulatory proposals to provide for safe implementation of indirect and direct potable reuse projects; and completing master planning of all recycled water efforts. Other aspects of this strategy include support and pursuit of legislative proposals to streamline the implementation of recycled water projects and provide potential funding.

9. Leverage opportunity to maintain uniquely accessible district facilities.

The current drought has raised interest in expediting implementation of both non-potable and potable reuse components of the district's long-term water supply plans by existing and potential recycled water partners, legislators, water users and others. Staff is identifying and preparing plans for high-priority recycled/purified water projects (up to 45,000 acre-feet per year) to help alleviate water supply shortages if the current drought continues; pursuing regulatory proposals to provide for safe implementation of indirect and direct potable reuse projects; and completing master planning of all recycled water efforts. Other aspects of this strategy include support and pursuit of legislative proposals to streamline the implementation of recycled water projects and provide potential funding.

10. Leverage opportunity to further development of the district's workforce.

    Effective drought response requires reassignment of staff resources to meet current needs, and this reassignment also creates opportunity for staff to gain new knowledge, skills and abilities. This strategy includes establishing processes for fair and expedited reassignment of staff resources to assist with implementation of drought response so that the district is better able to serve the public this year and in future years through workforce development.

11. Advance community knowledge, awareness, and understanding of the water supply system and services provided by the district.

    This strategy includes efforts to expand outreach communication and engagement with the general public and working even more closely with media to convey drought and water conservation messages. This also provides an opportunity to expand outreach to key stakeholders (e.g., city councils) and regional groups.

D. Administrative and Financial Management

12. Secure Federal and State legislative support to offset drought impacts and accelerate conservation and recycling programs.

    Staff is tracking a number of State and federal legislative initiatives aimed at providing drought relief and funding to offset costs of drought response and accelerate water supply and water use efficiency projects. This strategy focuses on providing input to legislators and implementing agencies on drought impacts and needs, as well as grant application requirements to maximize funding opportunities for district and customer projects and programs. The strategy also includes pursuing funding and reimbursements for district projects and programs and for collaborative opportunities that assist customers with offsetting financial impacts of the drought.

13. Leverage Emergency Operations Center (EOC) to assist in supporting drought efforts.

    Soon after the Governor's January 17, 2014, Declaration of Drought Emergency, the district activated its EOC at Level 1 to facilitate response to drought-status inquiries from the State Operations Center (SOC), Coastal Regional Operations Center (REOC) and the local Santa

Clara County Operational Area (OA). Emergency resource requests may be requested through the EOC, as determined by the district's EOC Director, and the EOC also helps track drought-related costs for potential reimbursement. The EOC communication structure provides opportunity for additional outreach to policy and staff representatives of local municipalities, the county and emergency response providers about the need to achieve the 30% water use reduction target and to promote water conservation.

14. Adjust district resource allocations necessary to respond to drought.

    This strategy includes identifying, tracking and processing budget adjustments and other adjustments of resources as needed to support overall implementation of drought response. In addition to staff resource adjustments discussed in Strategy #10, drought response is expected to include increased/adjusted budgets for an effective water use reduction campaign, additional pumping and water treatment costs, extraordinary maintenance projects, and supplemental imported water. The strategy includes clearly identifying the schedule impacts and other impacts of these resource adjustments as non-drought-related work is delayed or removed from project work plans.

15. Support the Board of Directors.

    This strategy includes ensuring that the Board is provided timely and accurate information on current water supply conditions and drought response to support their efforts and linkages to the community. This strategy includes support for the Board's Ad Hoc Water Conservation Committee and Ad Hoc Recycled Water Committee to discuss drought-related opportunities to advance these important programs. It also includes ensuring that Board advisory committees are informed of current water supply, drought response measures, and implementation of the 2016 water use reduction campaign. Board updates are provided monthly on current water supply and drought response, including progress toward achieving the 30% water use reduction target.

Section 5. Data Collection Methodology

This section describes how water use data is collected by the district for the monthly drought response status report.

A. Water Use Data Disclaimer

Due to the need to communicate retailer water use data and savings progress in a timely manner, water use data in this report is currently being self reported by the retailer and is subject to further QA/QC and verification, may not match district billing records and is therefore subject to change. The intent of this report is to illustrate a general month by month and cumulative trend in water use and savings efforts toward the goal of a 20 percent reduction in water use compared to the same period in 2013. Below is how the district typically would collect and store water use data.

B. Treated Water Data

The district measures the volume of treated water delivered to its treated water customers (major water retailers). Monthly treated water deliveries are measured by meters (scheduled, contract, non-contract, and total delivered) for each and all water retailers (contractors). Meters are recalibrated/maintained regularly and may error up to 2 percent. Otherwise, the water use values represent actual billed amounts. For this report, treated water data is being reported by retailers.

C. Groundwater Data

The groundwater data collection and reporting process includes sending a water production statement to the customer for them to complete and report their water use. Once the completed production statement data is reviewed and accepted by the district, the district considers the data to be validated. This process which was developed in consideration of the requirements of the District Act, results in at least a 6 week delay in groundwater production reporting. For this report, groundwater data is being reported by retailers.

D. SFPUC Water Data

The San Francisco Public Utilities Commission (SFPUC) has eight common retail water customers with the district. SFPUC reports monthly water use directly to the district (historically that data was provided to BAWSCA, who in turn provided it to the district). Five of the common customers have their metered deliveries measures by SFPUC at the beginning of the month. Two of the customers (Stanford and Palo Alto) have their meters read on the 18th or 19th, and therefore their monthly data is split between two months. For the purposes of this report, water use for the month, will be that water used as measured by the following month (i.e. March water use is water use measured in April). It should be noted that the SFPUC provides monthly billing reports labeled as Monthly Water Sales. That data contains water sold and used in the previous month (i.e. March Water Sales report contains February use data for the

many of the customers, including the five common customers whose meters are read on the first of March, for instance).
For this report, groundwater data is being reported by retailers.

E. Surface Water Data

For the purpose of this report, water use data represents use by large water retailers and does not include surface water deliveries by the district to its non-potable surface water customers. The only surface water use included in this report is from San Jose Water Company, which has surface water rights. San Jose Water Company has its own water treatment plant for their surface water.

F. Recycled Water Use

Historically, recycled water use has been tracked in-county by sales at the treatment plants. However, for the purposes of this report, an effort is being made to collect this data at the water retailer level. This requires even more coordination and participation with the recycled water retailers. Many of the water retailers do not read their meters monthly and therefore their recycled water use is not reported in this monthly report. It is important to know how county water savings may be accommodated by increases in water use. If the data can be collected monthly it will be reported as such, otherwise it will be reported in the semiannual and annual reports, as available.

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Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118-3686
Phone: (408) 265-2600   Fax: (408) 266-0271
www.valleywater.org

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District-wide Asset Management Plan

Appendix J

Santa Clara Valley
Water District

District-wide Asset Management Plan

December 2014

FINAL

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District-wide
Asset Management Plan

Santa Clara Valley Water District

December 2014

Prepared by:

Erin Baker, Engineering Unit Manager

Lisa Fleming, Associate Civil Engineer

Under the Direction of:

Frank Maitski, Deputy Operating Officer

Jim Fiedler, Chief Operating Officer

Beau Goldie, Chief Executive Officer

Contributors:

Scott Akin

Edward Drury

Suzanne Remien

Dipankar Sen

Sanjay Syal

Alan Zeisbrich

Acknowledgements:

Jae Abel
Joseph Aguilera
Neddal Ali-Adeeb
Linda Arluck
Brett Baker
Jill Bernhard
Marion Blair
Ray Bramer
John Brosnan
Jonathan Burgess
Chris Cannard
Colin Chung (GHD)
Jim Crowley
Jerry Cox
Mike Devore
Mike Duffy
Don Duran
Frank Fung
Terri Gross
Robert Haskins
Kurt Hassy
Theo Hipol
Ron Jacobs
George Kamenjati
Scott Katric
Ripen Kaur
Michelle Kim (GHD)
Anthony Le
Volin Lecky
Gary Masad
Becky McCullough
Greg Meamber
Joe Mello
Mark Merritt
Nagin Morar
Mario Munoz
Gary Nagaoka
Keiron Nawbat
Tony Ndah
Kristen O'Kane
Art Partridge
Chris Pilson
Lisa Porcella
Beth Redmond
Diana Ruiz
Amandeep Saini
Dave Salsbery
Jim Scott
Samina Shaikh
Mae Chielo Siendo
Jerry Sparkman
Mike Spiteri
Rahn Springer
Iday Syachrani (GHD)
Arvind Tailor
Darin Taylor
Phuong-Nhi Trieu
Roy Weese
Sunny Williams
Wing Yuen
Crystal Yezman

Asset Management Steering Committee Members: Aaron Baker, Norma Camacho, Angela Cheung, Najon Chu, Mike Cresap, Chris Elias, Jim Fiedler, Beau Goldie, Garth Hall, Liang Lee, Joan Maher, Frank Maitski, Jesus Nava, Katherine Oven, Melanie Richardson, Mary Ann Ruiz, Ravi Subramanian, Sudhanshu Tikekar

Executive Summary

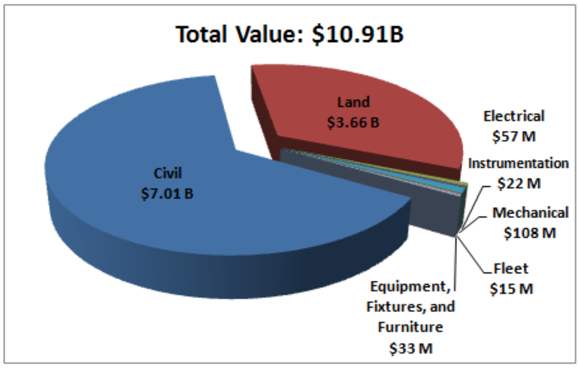
This is the Santa Clara Valley Water District's (District) first comprehensive Asset Management Plan, and includes the assets that support the District's core businesses of supplying wholesale water, providing flood protection, and serving as environmental steward for clean, safe creeks and healthy ecosystems. The plan also includes the administration assets that support the District's core business functions. The plan documents the current state of these assets, and how they are being managed to provide the services required of the District. The plan also presents the expected future investment needs for the assets to sustain District services.

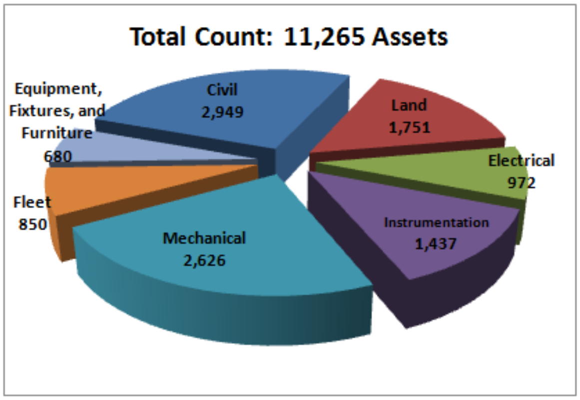
The purpose of this plan is to guide the District in managing its assets. Over time, the District intends to improve management of its assets by optimizing asset renewal strategies in order to minimize asset lifecycle costs while providing required levels of service at an acceptable level of risk. This plan is a starting point by which the District can measure future improvements. It is intended to be a living document that is continually updated and refined as part of an ongoing asset management and business improvement process.

The District's goal for this first plan was to include 80 percent of its assets at a 50 percent confidence level. A confidence level describes the quality of the plan, and indicates the District's confidence in the findings in the plan. The plan includes 90 to 95 percent of the District's assets, and the confidence level rating is 65 percent. The plan is useful in understanding the current state of the District's assets and understanding the magnitude of investment needs, but is not sufficiently developed to be useful in making critical business risk or financial decisions at this point. Confidence in the plan will improve over time with improvements to the asset management program.

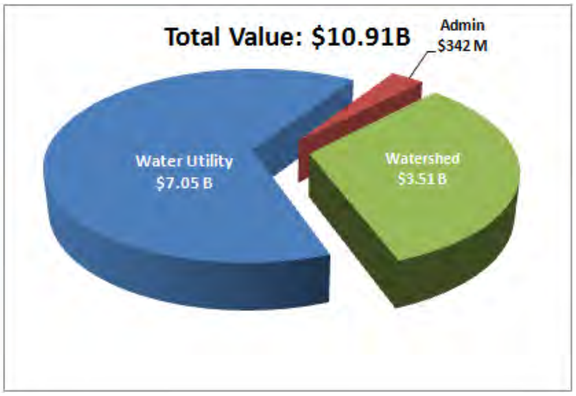
Current State of the Assets

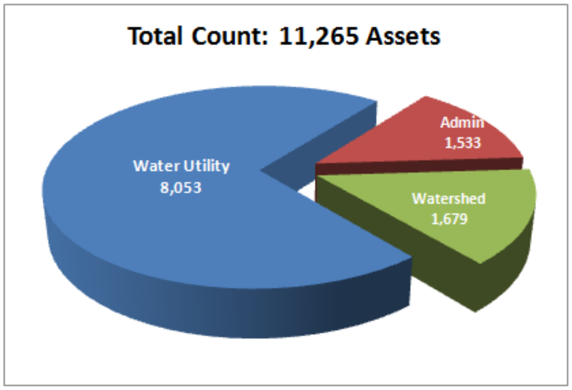
The District owns and manages a variety of assets including creeks, wildlife habitat, pipelines, reservoirs, ponds, water treatment plants, pump stations, information technology tools, office buildings, land, heavy equipment and fleet vehicles. The District has inventoried 11,265 assets. The estimated replacement value of these assets is $10.9 Billion. The figures below show the number and value of assets included in each major asset class. Civil and land assets make up the majority of asset value.





The District's assets can also be divided by business area. The figures below show the number and value of assets within the District's three business areas. The majority of assets by count and value are within the Water Utility.





The District monitors asset condition through routine condition assessments, in which an inspector assigns each asset a condition score using a one to five scale. Not all District assets have condition scores at this time. Land, fleet, and a variety of other assets have not been scored. Table E1-1 provides a summary of water utility asset condition and Table E1-2 provides a summary of administration asset condition. The majority of water utility and administration assets that have been scored are in the 2 to 3 range, meaning minor maintenance required. The assets with scores of 4 or 5 do not necessarily require a renewal project at this time. Some assets are run to failure before replacement.

Watershed asset condition scores are summarized in Table E1-3. The summary is slightly different than the other two business area summaries. Watershed condition is summarized by number of sites with each score per watershed. This is because creek and reach wide scores are not yet available. A creek can have multiple spots along its entire length that have failed or need repair, while the creek as a whole may be in good condition. Because of this, it is difficult to assign one score to the entire channel, though the District is working to develop condition scores for each creek and reach. The majority of scores are in the 3-4 range, meaning significant maintenance or renewal is required.

Level of Service

The District Act, Board Policy, voter approved measures, laws, regulations, permit requirements, and contractual agreements define service levels required of the District's assets. In addition, the Watershed asset management program has established creek specific levels of service for seven creeks. The District knows the design capacity of its major facilities such as water treatment plants, pipelines, and pump stations, but in many cases does not have specific levels of service for its larger asset classes. As a result, this plan recommends that the District develop a methodology for establishing and optimizing levels of service at an asset and facility level, and implement that methodology in the three business areas.

Table E1-1. Water Utility Condition Summary

Condition Score	No. of Assets	% by No.	Value of Assets	% by Value
1 – Excellent	902	11%	$58,329,000	<1%
2 – Minor Defects	3,477	43%	$3,301,437,000	47%
3 – Maintenance Required	2,277	28%	$2,037,709,000	29%
4 – Major Renewal Required	585	7%	$139,946,000	2%
5 – Unserviceable/Failed	227	3%	$5,535,000	<1%
Land (Not Scored)	300	4%	$915,705,000	13%
Other Not Scored	285	4%	$596,201,000	8%
Total	8,053	100%	$7,054,861,000	100%

Table E1-2. Administration Condition Summary

Condition Score	No. of Assets	% by No.	Value of Assets	% by Value
1 – Excellent	32	2%	$19,255,000	6%
2 – Minor Defects	297	19%	$64,833,000	19%
3 – Maintenance Required	87	6%	$20,406,000	6%
4 – Major Renewal Required	110	7%	$33,134,000	10%
5 – Unserviceable/Failed	152	10%	$6,564,000	2%
Land (not scored)	5	0%	$183,141,000	54%
Fleet (not scored)	850	55%	$14,603,000	4%
Total	1533	100%	$341,936,000	100%

Table E1-3. Watershed Condition Summary

	Number of Sites with Condition Score					
	1	2	3	4	5	Total
Watershed	Excellent	Minor Defects	Maintenance Required	Major Renewal Required	Unserviceable or Failed	
Lower Peninsula	0	ND	451	260	0	**711**
West Valley	0	ND	471	171	0	**642**
Guadalupe	0	22	129	383	0	**534**
Coyote	0	170	169	837	5	**1,181**
Pajaro	2	73	99	291	4	**469**

ND = No data

Business Risk

The District recently began implementing a new risk assessment method, business risk exposure. Business risk exposure is the product of consequence and probability of failure. This plan found that the District's risk analysis requires significant improvement, for the following reasons:

- Some assets are missing scores (consequence, probability, or both).
- Some risk scores are outdated and need to be updated.
- The risk methodology was not applied consistently to all three business areas.
- The established thresholds for high, moderate, and low risk categories may not be suitable.

Although the risk data was not highly reliable or accurate, the risk profile developed for the plan is presented in Section 4.2

As a result of this plan, the District intends to update and validate risk scores for all assets, and to work to apply the risk methodology consistently in all areas of the District.

Management Strategies

An asset's "management strategy" dictates when and how it is inspected, operated, maintained, rehabilitated, replaced, and decommissioned. Optimizing an asset's management strategy reduces risk of asset failure and minimizes lifecycle costs associated with owning the asset. An asset management plan compiles management strategies to show the timing and cost of renewal activities for all the assets. The compilation of multiple years' renewal activities and costs makes up the long-range financial projection.

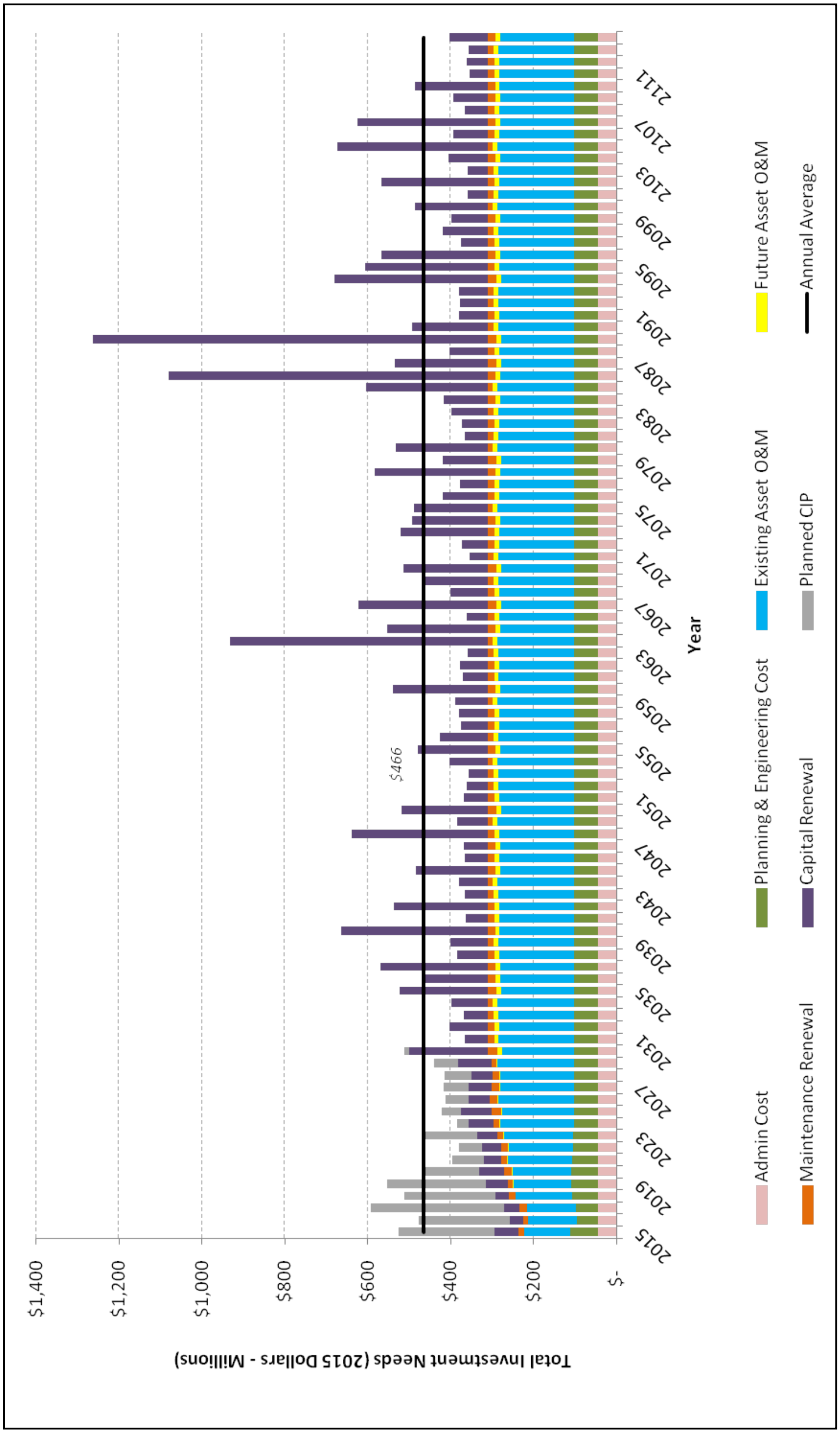
The District is just beginning to document formal management strategies for its assets, and in general has not optimized management strategies. The District needs to validate and optimize management strategies, particularly for more critical assets such as pipelines. Developing and optimizing management strategies will improve the management of the District's assets and the quality of the financial projection.

Financial Projection

Based on the management strategies and asset replacement values known today, this plan predicts an annual investment of $466 Million to continue operating at current service levels for the next 100 years. The 100-year projection is shown in Figure E1-1. The 100-year average annual investment of $466 Million is slightly less than the District's FY15 Budget of $469 Million. The average capital expenditure over the next 100 years is $161.5 Million per year. This is significantly less than the District's current capital budget of $232.8 Million, which is consistent with the major asset renewals currently in progress, including dam and water treatment plant retrofits. The three peak investments in the future are:

- 2064: Pacheco Tunnel renewal ($538M)
- 2086: Coyote, Stevens Creek, and Calero Auxiliary Dams renewal ($150M per dam)
- 2089: Santa Clara Conduit renewal ($580M); Almaden Dam renewal ($150M)

Figure E1-1. District 100 Year Financial Projection



The operations and maintenance, planning and engineering, and administration costs shown in the forecast are derived from current District budgets. One major goal of the asset management program is to begin to use the asset management plan to derive the operations, maintenance, planning and engineering budgets.

Although the forecast shows that the District's current budget of $469 Million is sufficient to sustain existing infrastructure in the future, it is too premature to state whether this is true. This is the District's first iteration of an asset management plan. It is based on several assumptions, and will be refined and improved over time to present a more accurate picture of future financial needs. Understanding the future investment needs will improve the District's ability to make sustainable and proactive management decisions.

Findings and Recommendations

The plan provides recommendations for improving the quality of future asset management plans, and more importantly, for improving the management of District assets. The two most critical areas of improvement for the District in the next few years are establishing an accurate risk profile and developing more specific levels of service.

Detailed recommendations are available in Chapter 7, and are summarized below.

- Update and validate risk scores, ensuring consistent application of risk criteria across all business areas.
- Update thresholds for critical, moderate, and low risk scores.
- Develop and implement a method for establishing asset or facility specific levels of service.
- Work towards using the Asset Management Plan to derive operations, maintenance, planning, and engineering budgets.
- Document and optimize management strategies. Include analysis of all modes of failure, incorporate climate change, and consider decommissioning where appropriate.
- Involve engineering, operations, and maintenance staff more in development of future plans.
- Develop asset registries for facilities and ecological assets, and continue to improve existing registries.
- Continue to refine asset values, particularly land and natural asset (aquifer, creek) values.
- Consider using the ISO 55001 standard as a benchmarking tool for the asset management program

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1. Introduction

This is the District's first comprehensive Asset Management Plan, and includes the assets that support the District's core businesses of supplying wholesale water, providing flood protection, and serving as environmental steward for clean, safe creeks and healthy ecosystems. The plan also includes the administration assets that support the District's core business functions, including buildings, grounds, computer hardware, software, fleet, and equipment assets.

The purpose of this plan is to guide the Santa Clara Valley Water District (District) in managing its assets. Over time, the District intends to improve management of its assets by optimizing asset renewal strategies in order to minimize asset lifecycle costs while providing required levels of service at an acceptable level of risk. As such, the plan documents the current state of the District's assets, and how the assets are being managed to provide the services required of the District. The plan also presents the expected future investment needs to sustain District services.

The plan provides recommendations for the District to improve the management of its assets. This plan is a starting point by which the District can measure future improvements to the Asset Management Program. The plan identifies areas where improvements are required, so the District knows what to work towards in the future. It is intended to be a living document that is continually updated and refined as part of an ongoing asset management and business improvement process.

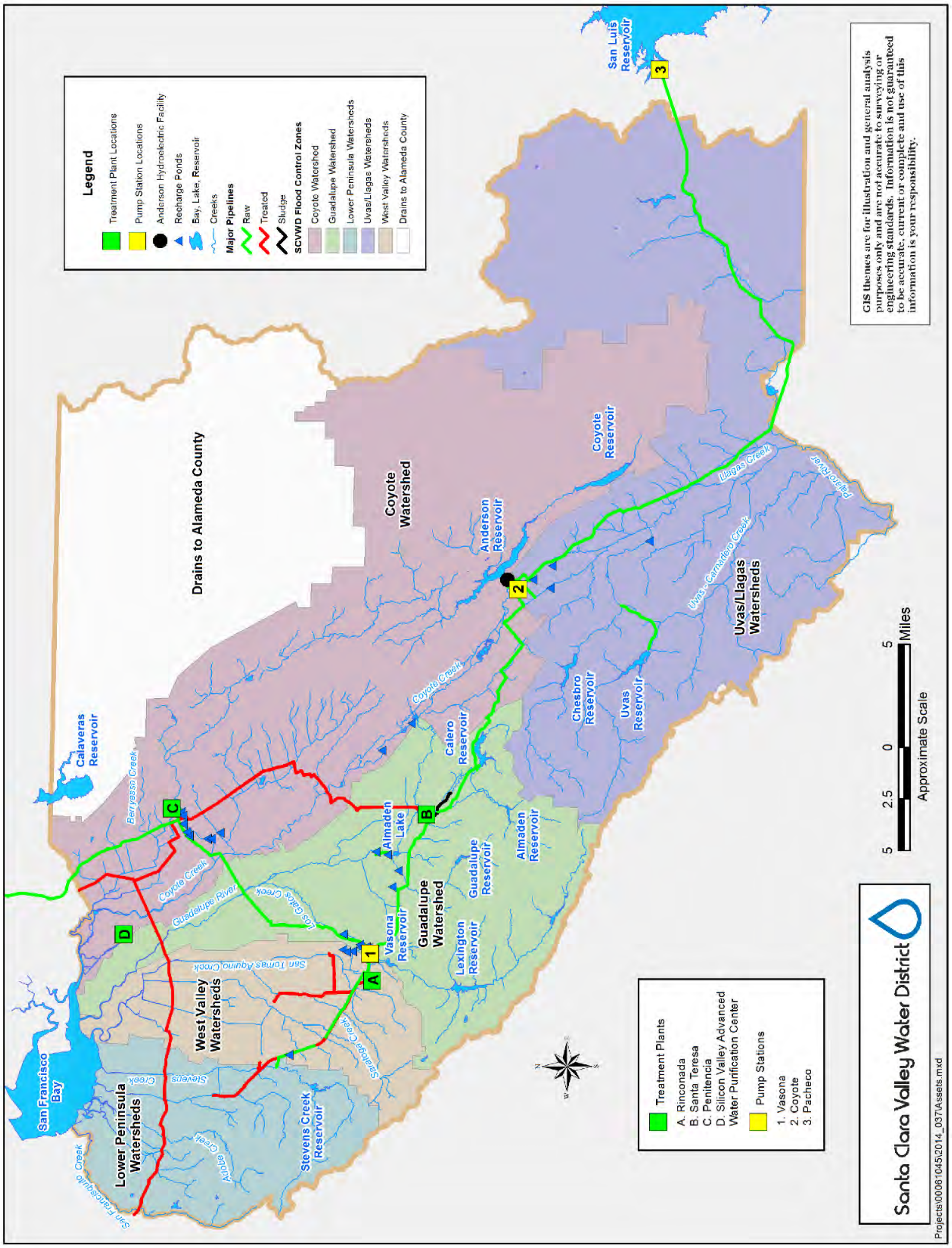
1.1. District Services

The District is the primary water resource agency for Santa Clara County, supplying wholesale water, providing flood protection and serving as environmental steward for clean, safe creeks and healthy ecosystems. It serves approximately two million people in 15 cities: Campbell, Cupertino, Gilroy, Los Altos Hills, Milpitas, Monte Sereno, Morgan Hill, Mt. View, Palo Alto, San Jose, Santa Clara, Saratoga and Sunnyvale, and the towns of Los Altos and Los Gatos.

- As the county's water wholesaler, the District makes sure there is enough clean, safe water for homes and businesses.
- As the agency responsible for local flood protection, the District works diligently to protect Santa Clara Valley residents and businesses from the devastating effects of flooding.
- As an environmental steward, the District's responsibilities include creek restoration and wildlife habitat projects, pollution prevention efforts and a commitment to natural flood protection.

The District owns and manages many different types of assets that provide these services, including creeks, wildlife habitat, pipelines, reservoirs, ponds, water treatment plants, pump stations, information technology tools, office buildings, heavy equipment and fleet vehicles. Figure 1-1 provides a map of District facilities.

Figure 1-1. District Facilities



GIS themes are for illustration and general analysis purposes only and are not accurate to surveying or engineering standards. Information is not guaranteed to be accurate, current or complete and use of this information is your responsibility.

1.2. Santa Clara Valley Water District's Asset Management Program

As part of its approach to managing its assets, the District implements a comprehensive asset management program to optimize infrastructure investment strategies and enhance financial planning. The District made substantial public investments in assets that provide water supply, flood protection, and environmental stewardship services for residents and businesses in Silicon Valley. The District must manage these assets in a manner that makes the best use of public resources in order to sustain these services indefinitely into the future.

In the short term, the District asset management program seeks to reduce unplanned asset failures or service outages, and the economic, social, or environmental consequences of these failures. For the long-term, this program seeks to minimize operating and capital costs of owning these assets, and improve financial planning.

1.2.1. Asset Management Framework and Model

The District has an Asset Management Framework that provides guidance for the development, implementation, and continual improvement of its asset management program. The District's framework defines asset management as:

> *A management paradigm and body of management practices that apply economic, social, and environmental considerations to the entire portfolio of infrastructure and natural assets at all levels of the organization seeking to minimize total costs of acquiring, operating, maintaining, renewing, and augmenting assets while sustainably delivering the service levels customers desire, and regulators require, at an acceptable level of risk.*

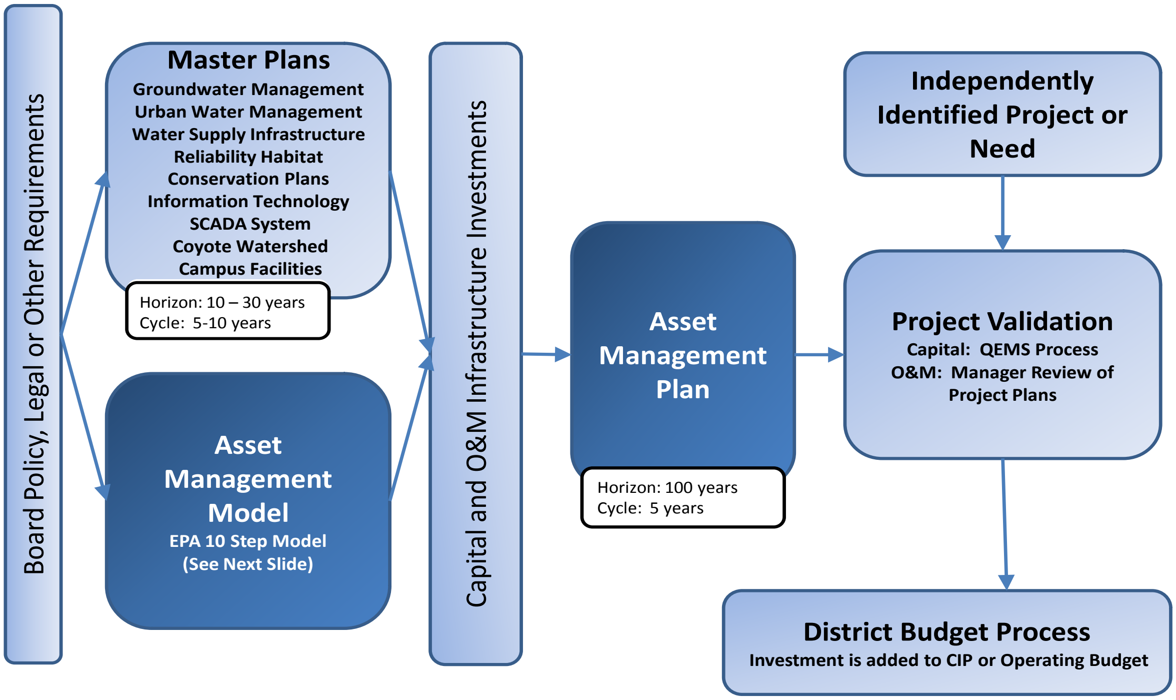
For the purposes of the District asset management program, the term "asset" refers to:

> *A component or feature of an infrastructure or facility, natural or constructed, which has value greater than $2,500 or is critical for performance, enables services to be provided, has an economic life greater than 12 months, and/or poses a liability to the District if allowed to deteriorate.*

The District's asset management framework is shown in Figure 1-2. The dark shaded boxes represent work done in the District's asset management programs. The District's Board Policy and other legal requirements guide the development of long range or master plans and the asset management model. There is some overlap between master planning and asset management planning, but in general, master plans analyze future and system-wide infrastructure needs, often identifying new infrastructure. At this time, the asset management model studies investment needs for assets currently owned by the District, and takes a more in depth look at individual assets. In time, the District intends for the asset management models to analyze system-wide and future infrastructure needs, perhaps reducing or eliminating the need for other master plans.

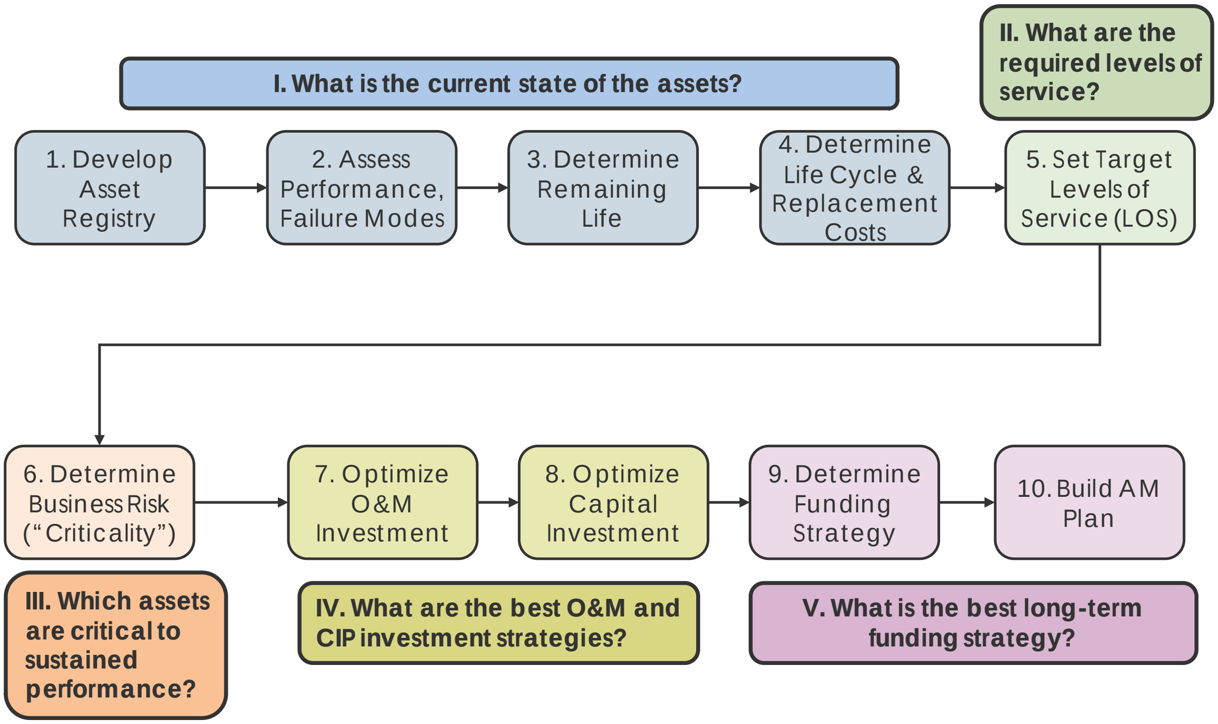
Both master plans and the asset management model identify capital and operations & maintenance infrastructure investments needed to sustain District services. The infrastructure investments are compiled into an Asset Management Plan. The investments are validated before being incorporated into District budgets.

Figure 1-2. District Asset Management Framework



The District's asset management model is based on the EPA's ten step asset management planning model and international infrastructure management manual guidelines. It consists of ten steps as shown in Figure 1-3. The 10 step model answers the five core questions shown in the figure. The model ultimately results in an asset management plan.

Figure 1-3. Ten-step Asset Management Planning Model



1.2.2. IT Tools & Systems

Information technology tools and systems that support the asset management programs are critical to the success of the programs. With tens of thousands of assets to manage, the District needs effective tools to manage the immense amount of data associated with those assets. The District's Computerized Maintenance Management System, or CMMS, is integral to the asset management program. The District's CMMS helps track and manage District assets, maintenance service requests and work activities. The CMMS program consists of a number of work management tools and reporting capabilities that integrate across the District's computer systems to help staff and management better achieve District asset management objectives.

The District's Maximo system is the central or core system for the CMMS program. Maximo serves as a central depository of all asset and maintenance related data. It allows for accurate and complete asset data to be collected, stored and retrieved. The Maximo system synchronizes with several other District systems (including GIS, PeopleSoft, mobile handheld devices, risk management tools, long-term funding analysis tools, and maintenance scheduling tools) to collect asset data related to field condition assessments, labor, services and supplies costs, and future financial needs. Over the past two years, the District's CMMS program has implemented several asset data management and business process improvements, including restructuring District asset hierarchies and classifications, creating custom Maximo start centers, and configuring key performance indicators, among others.

1.3. Plan Outline

The outline of this plan generally follows the ten step model and five core questions shown in Figure 1-3. Brief descriptions of each chapter of this asset management plan are presented below.

Chapter 1: Introduction provides background on the Santa Clara Valley Water District and the District's Asset Management Program.

Chapter 2: State of the Assets provides information on the assets included in the Asset Management Plan. This chapter identifies the assets, estimates their replacement value, and presents their current condition.

Chapter 3: Current and Future Levels of Service documents levels of service from District Board policy, contracts, and regulations.

Chapter 4: Business Risk Exposure summarizes the methodology used to assess risk, and presents a summary of the District's current risk profile based on existing data.

Chapter 5: Management Strategies provides background on management strategies and an overview of how the District manages its major asset classes or facilities.

Chapter 6: Financial Projection presents the 100-year financial projection for District infrastructure investments, and for each business area.

Chapter 7: Plan and Program Improvements documents the confidence level rating for the elements of this asset management plan and identifies improvements to enhance the asset management program.

Chapter 8: Implementation Plan provides an overview and schedule for the activities the District intends to implement for successful management of its assets.

2. State of the Assets

This chapter provides a snapshot of the current state of the District's assets. It documents the assets included in all three business areas of the District (Administration, Water Utility, and Watersheds), their replacement cost, condition, and remaining life. This information forms the foundation of the asset management plan. Information on the state of assets, along with management strategies presented in Chapter 5, determine the long-range financial projections, which are presented in Chapter 6 of this plan.

2.1. Asset Inventory and Hierarchy

The District owns and manages many different types of assets including creeks, wildlife habitat, pipelines, reservoirs, ponds, water treatment plants, pump stations, information technology tools, office buildings, heavy equipment and fleet vehicles. The complete District inventory is organized in a hierarchy, provided in Appendix One. Inventory and hierarchy data for the District's assets is primarily stored in the District's Computerized Maintenance Management System (CMMS), Maximo. Table 2-1 summarizes the District's asset inventory.

Table 2-2 lists facilities and groups of assets or systems that are included in this plan as one single asset, with a lump sum cost for the entire facility, group, or system rather than a hierarchical listing and complete inventory of all the child assets within the facility or system. Complete asset inventories for these facilities and assets are not yet entered in the District's asset register in Maximo. Also, some of the facilities and systems are not considered critical for operations, have a low probability of failure, or have a low consequence of failure. More detailed inventories for those facilities, systems, and asset groups listed below will be included in future plans.

Sections 2.3 and 2.4 provide a 'count' or number of assets. The District owns "point" assets, "linear" assets, and "spatial" assets, as defined below:

- **Point** – A single asset such as a pump, valve, or building. Point assets are counted by number, including those located at the headquarters campus (vehicles, servers, etc.), water treatment plants (tanks, basins, etc.), pump stations (pumps, drives, etc.), dams (dam structure, outlet works, etc.), along pipelines (valves, vaults, etc.), along creeks (condition sites, outfalls, fish passage facilities), and at recharge facilities (diversion dams, fish screens, etc.).
- **Linear** – An asset that extends along a certain length, such as a creek or pipeline. These assets can be counted by number (number of creeks or pipelines), or by length (miles of creek or pipeline). In this plan, non-watershed linear assets including pipelines and roads are counted by number (e.g. number of roads at RWTP = 3). Watershed linear assets including natural channel, concrete channel, and levees, and are counted by length in miles (e.g. miles of levee).
- **Spatial** – An asset that exists over a certain area, such as a land parcel or pond. These assets can be counted by number (number of parcels or ponds), or by area (acres of land or ponds). In this

plan, spatial assets are counted by number, including land (number of parcels), ponds, and reservoirs.

Table 2-1. District Asset Inventory Summary

Asset	Count	Size/Capacity
Water Utility[1]		
Raw Water Pipelines	11	94.3 miles
Treated Water Pipelines	10	39.8 miles
Water Treatment Plants	3	220 MGD
Raw Water Pump Stations	3	758 MGD
Wastewater Treatment Plants	1	8 MGD
Treated Water Pump Stations	3	45.7 MGD
Raw Water Reservoirs	10	169,000 ac-ft
Treated Water Reservoir	1	15 MG
Groundwater Percolation Pond Facilities	25	259.7 acres[2]
Raw Water Desilting Basins	4	5.5 acres[2]
Tunnels	3	8.75 miles
Hydroelectric Facilities	1	900 kW
Diversion Dams	9	25,000 ac-ft
Canals and Ditches	5	17.3 miles
Wells – drinking water	1	3 MGD
Watersheds		
Natural Channels, County Total**	176	817.5 miles
Natural Channels, District Fee/Easement **		279 miles
Concrete-lined Channels		43.5 miles
Levees, District-owned**		101.3 miles
Fish Passage Facilities	29	
Administration		
Class I – III Vehicles	300	
Class IV Equipment	550	
Buildings	12	300,500 sq. ft.
Radios	228	
Servers	133	
Software	51	

[1] Includes USBR facilities maintained by the District, but not State Water Project facilities
[2] Water surface area

[3] Data obtained from watershed creek inspection reports

Table 2-2. Facilities, Groups, or Systems Included as a Single Asset

Assets	Justification*
Water Utility	
South County Regional Wastewater Authority (Gilroy Reclamation Line, Booster Pump Stations)	Asset register is not complete in Maximo and will require significant research to find needed asset data.
Silicon Valley Advanced Water Purification Center	Asset register is complete but not in Maximo. Low consequence of failure since it is not a drinking water plant, and low probability of failure since it is new.
Production Well Meters (North and South Co.)	These assets are being incorporated into the water utility asset management program.
Groundwater Monitoring Wells	Assets are not in Maximo. Low consequence of failure of any single well due to high redundancy.
Modular or Temporary Buildings at WU facilities	These buildings are not critical for operations.
Some Building Systems (HVAC, Fire, Domestic Water)	Assets are not in Maximo and will require significant research to find needed asset data.
Administration	
Building Systems (HVAC, Fire, Security, Roads, etc.) for Almaden Campus Buildings	Asset register is not complete in Maximo and will require significant research to find needed asset data.
Modular Buildings at Winfield Vegetation Management Facility	Assets are not in Maximo. These buildings are not critical for operations
Watersheds	
Some natural channel reaches on land not owned by District	Land is not owned by District
Some outfalls, fish passage facilities, stream gauges	Assets are not in Maximo and require significant research and field work to find needed data.
Ecological Assets	Framework for managing these assets is being developed.

*As of June 2014

2.2. Asset Value

Asset valuation is an integral part of asset management. Valuation supports budget planning by identifying replacement costs, high value assets, and the total replacement value of all assets. The District's asset management program values assets using ***replacement value***. Replacement value is the cost to replace an asset. It is equal to equipment cost plus installation cost (labor, equipment, materials to install the asset). For this plan, all District assets were assigned an *estimated* replacement value. Assets can be valued with other accounting methods such as book value or depreciated value. Book value is more useful for accounting purposes, and is not included in the asset management plan.

Some assets such as natural creek channels, levees, and reservoirs do not have a replacement value. A natural channel or a levee will be maintained indefinitely, but not replaced. A dam structure creating a reservoir could be replaced, but the reservoir itself would not be replaced, only be maintained (cleaned, erosion repair). The maintenance costs for these assets are captured in the financial forecast in Chapter 6, and the land under these assets is captured in the asset count and valuation; however, other than land value, these assets are not captured in the asset valuation charts in this Chapter. The District is working with other agencies to value natural assets such as the groundwater aquifer, creeks, mitigation sites, and other ecological assets. For now, these values are not included in the asset management plan, but will be included in the future, as a methodology for valuing these types of assets is developed.

Replacement costs for this plan are based on several assumptions, shown in Appendix Two. These assumptions influence the accuracy of the total estimated replacement cost for District assets, and the accuracy of the financial projection in Chapter 6. In order to improve the accuracy of the financial projection, the District needs to continue to refine estimated replacement costs for each asset.

2.3. District Inventory and Value by Class

The District classifies assets according to a structure that assigns a class, subclass, and type to each asset. The District's classification structure is included in Appendix Three. Figure 2-1 summarizes the number of District assets by class. As shown, civil and mechanical assets comprise the majority of District's assets. These are mostly water utility assets including large concrete structures, pipe, and roads (civil); and pumps and valves (mechanical). Land is counted by the number of parcels, which, along with instrumentation, make up the next two largest counts of assets. Again, some groups of assets and entire facilities have been assigned one lump sum for the valuation in this plan, as shown in Table 2-2.

A summary of District asset valuation by class is provided below in Figure 2-2. The estimated replacement cost for all District assets included in the plan is approximately $10.9 Billion. Civil assets make up 63 percent of total District replacement cost. This includes replacement cost of dams, water treatment plant buildings and basins, headquarters campus buildings, concrete lined channels, pipelines, and water supply ponds and their associated appurtenances. As noted in Section 2.2, aside from the land underneath them, replacement value for levees, natural channels, and reservoirs are not included in the valuation charts.

Figure 2-1. Total District Asset Count by Class

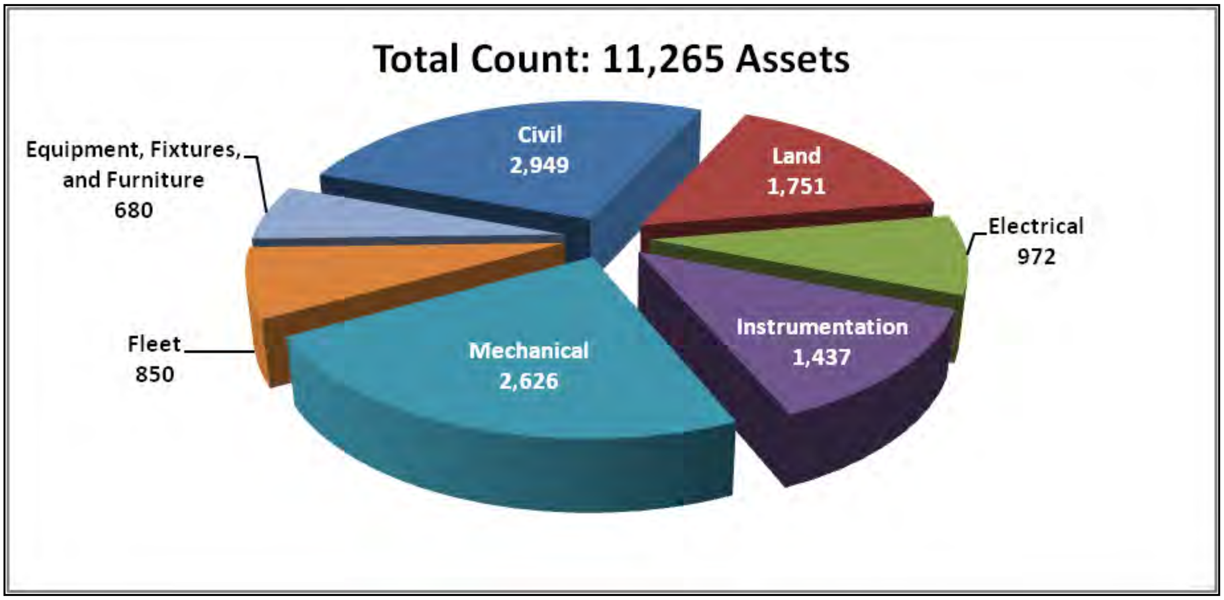


Figure 2-2. Total District Asset Value by Class

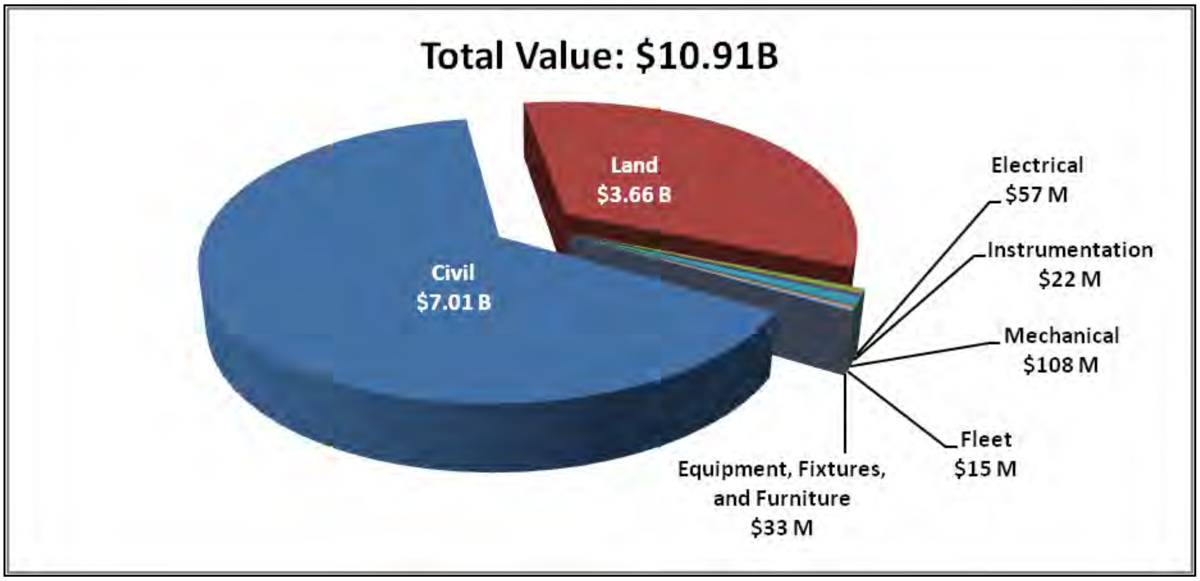


Table 2-3 shows the percentage of each asset class by total count and by value. The last two columns present the District inventory and value information without land included. This gives a clearer representation of District assets since, for the most part, land is not a managed asset. When land is included it comprises 34 percent of total asset value and civil assets make up 64 percent of total asset value. When land is removed, civil assets represent 97 percent of the total value.

Table 2-3. Total Percentage of Asset Count and Value by Class

Asset Class	% of total by Count	% of total by Value	% of total by Count w/out Land included	% of total by Value w/out Land included
Civil	26%	64%	31%	97%
Electrical	9%	<1%	10%	<1%
Equipment, Fixtures, Furniture	6%	<1%	7%	<1%
Fleet	7%	<1%	9%	<1%
Instrumentation	13%	<1%	15%	<1%
Land	16%	34%	-----	-----
Mechanical	23%	<1%	28%	2%

Figure 2-3 summarizes the count of civil assets. Structures are the largest subclass within the civil class. 49 percent of civil assets are classified as structures. This subclass is comprised of vaults, dams, treatment plant basins, ponds, weirs, spillways, block houses, and other large non-building structures. The subclass land Improvements includes assets like roads, fences, parking lots, gates, and percolation pond signs and stairs. The one well shown is a placeholder for the Campbell well fields. The asset registry for the well fields has not been developed, so the entire facility is currently shown as one asset, but in reality includes many assets.

Figure 2-4 shows the replacement value for civil asset subclasses. As shown in this figure, structures make up the largest percentage of replacement value of the civil assets, primarily due to the high replacement value of Dams. Pipes have the second largest replacement value. Pipe replacement costs are high not because of material costs, but due to planning, designing, constructing, and accessing the pipelines. Many pipelines are buried under roadways. There are two additional subclasses shown in Figure 2-4 that are not shown in Figure 2-3: concrete channels and flood walls. These assets have a replacement value, as they will be reconstructed or replaced one day. However, these assets are not included in the asset count because this plan counts watershed linear assets in miles, not number, as described in Section 2.1.

Figure 2-3. Total District Civil Asset Count by Subclass

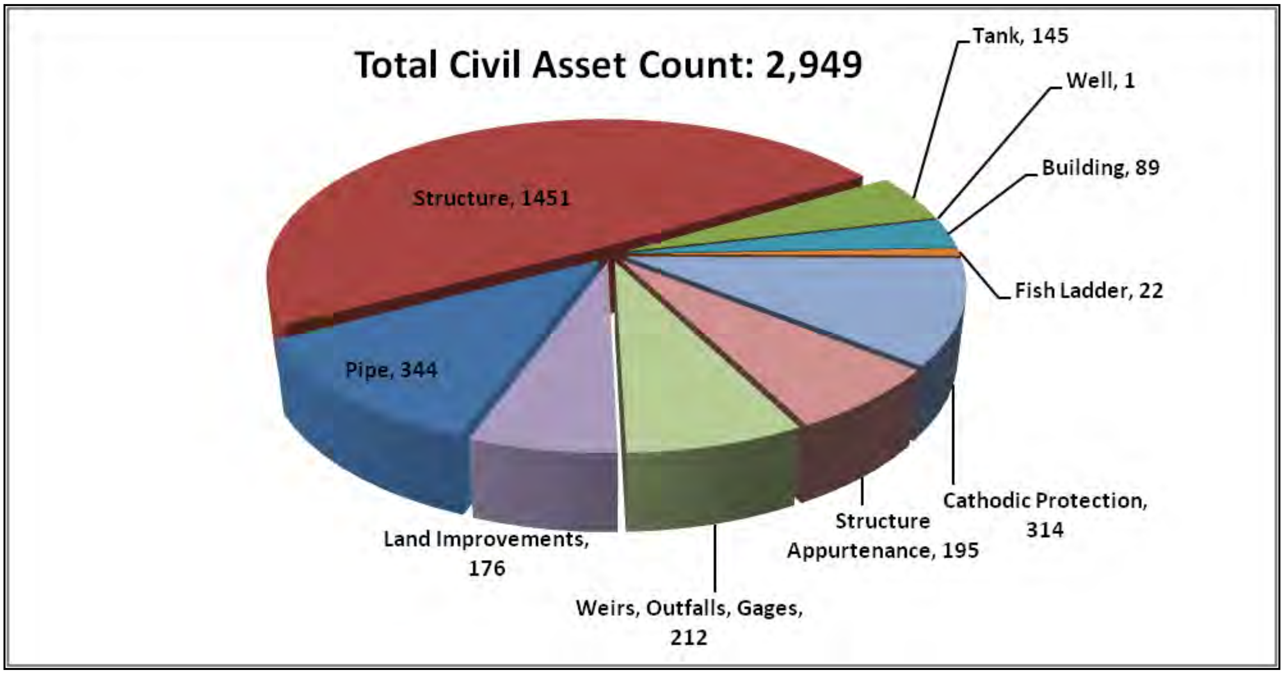
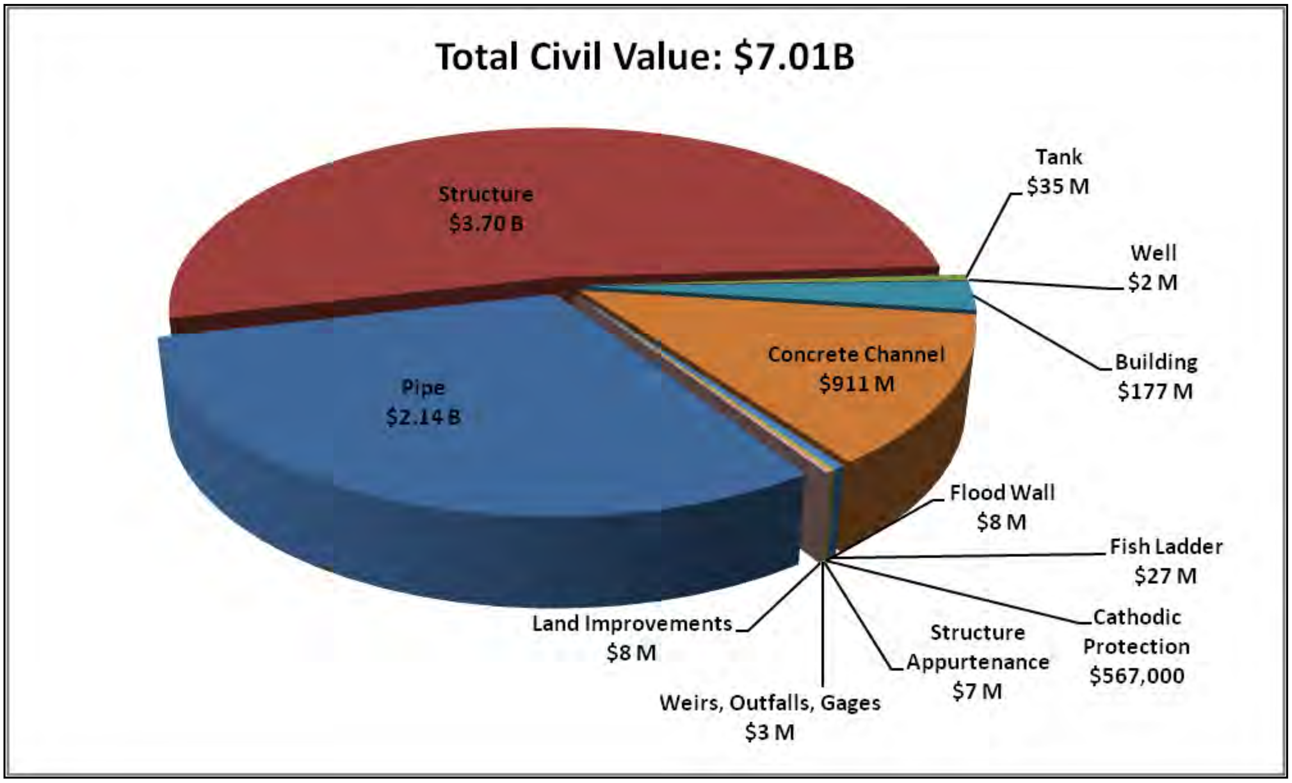


Figure 2-4. Total District Civil Asset Value by Subclass



2.4. District Inventory and Value by Business Area

Figure 2-5 summarizes the number of District assets by business area. Water utility comprises the majority of District assets, at 71 percent, while watershed and administration assets are about equal, comprising 15 and 14 percent of the total, respectively. Not all individual assets have been included in this plan, and these percentages may change in future plans as more assets are added to the registry. See Table 2-2 for a list of facilities, systems, and groups of assets that have been included in the asset count as one single asset.

Also, the linear mileage of creeks is not included in the asset counts shown in Figure 2-5. As described in Section 2.1, there are several ways to count creek assets within a watershed. To better quantify the count of linear watershed assets, this plan summarizes the total number and miles of creeks. The count of watershed assets shown in Figure 2-5 below includes the number of non-linear watershed assets including fish passage facility, stream gages, and outfalls; and parcels of land used by the watershed business area. Table 2-5 in Section 2.4.2 summarizes the linear watershed assets.

Figure 2-5. Total District Asset Count by Business Area

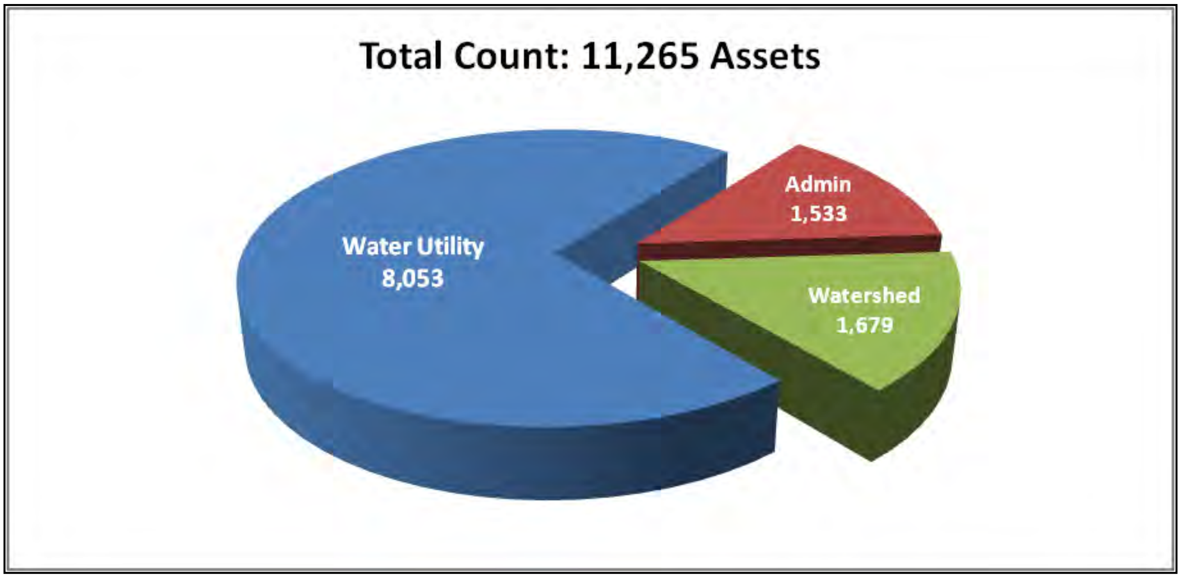
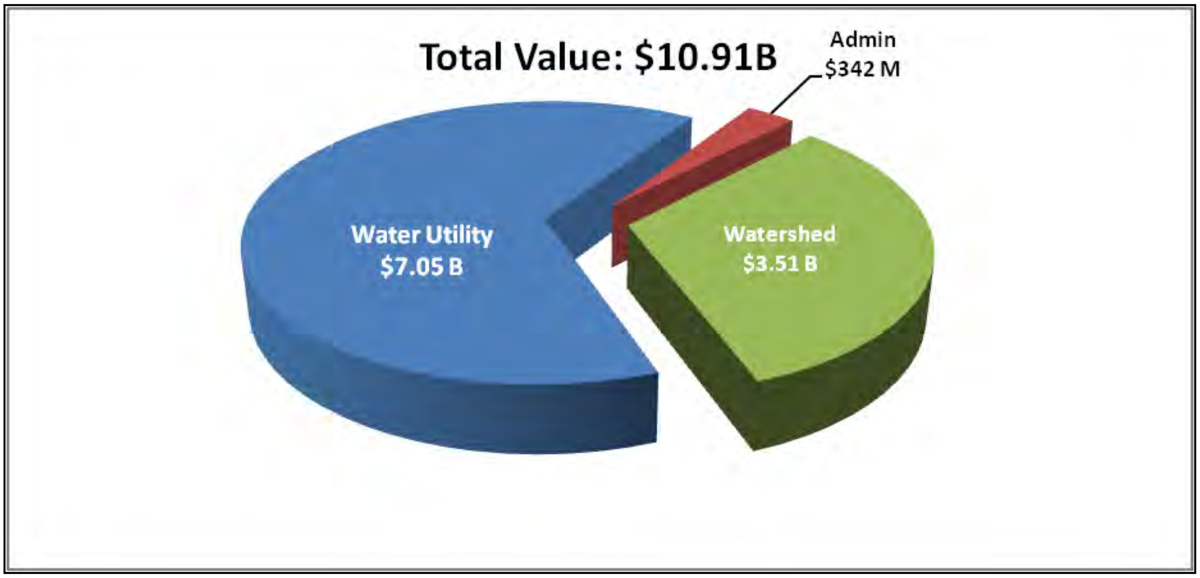


Table 2-4. Total Percentage of Asset Count and Value by Business Area

Business Area	% of Total by Count	% of Total by Value
Water Utility	71%	65%
Watershed	15%	32%
Administration	14%	3%

Figure 2-6. Total District Asset Value by Business Area



2.4.1. Water Utility Inventory Details

There are 8,053 assets included in the water utility asset register for this plan. However, not all individual water utility assets are included in the asset count in this plan. As shown in Table 2-2, the Silicon Valley Advanced Water Purification Center, which contains over 4,000 assets, was counted as a single asset in this plan because the asset register was still under development at the time of the plan's completion. Also, it is a new facility and therefore has a low probability of failure. The addition of the 4,000 SVAWPC assets to the asset register will greatly increase the asset count in the water utility.

Figure 2-7. Water Utility Asset Count by Class

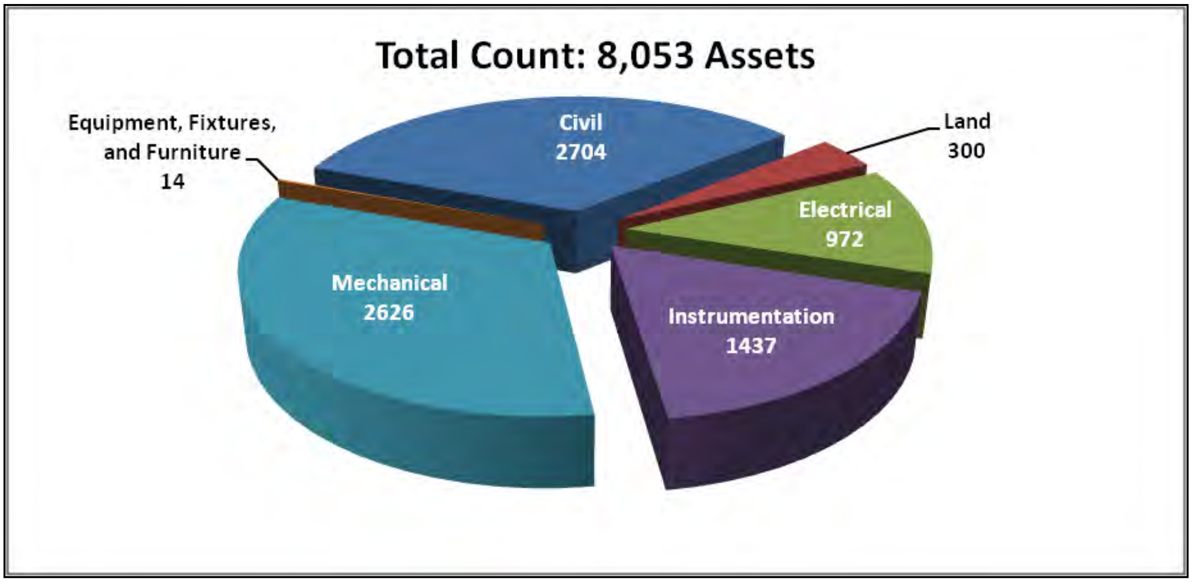


Figure 2-8. Water Utility Asset Value by Class

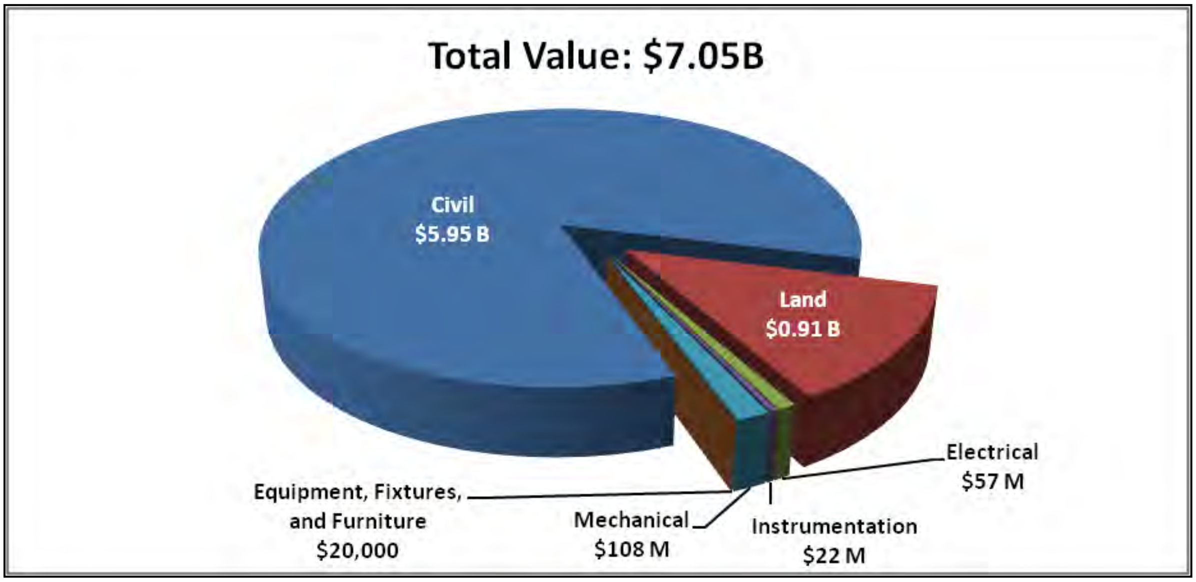


Figure 2-7 shows the water utility assets are fairly evenly distributed among six classes of assets, with the exception of the Equipment, Fixtures, and Furniture subclass. The 14 assets identified in this class are the SCBA (self-contained breathing apparatus) equipment at Rinconada and Penitencia Water Treatment Plants. The count for the land assets is total number of parcels of land related to the water utility (e.g. land under reservoirs, pipelines, water treatment plants and pump stations).

Figure 2-8 summarizes the water utility asset value by class. The civil assets within the water utility make up most of the replacement cost for water utility assets. Civil assets include dams, pipelines, tunnels, and water treatment plant buildings and basins.

2.4.2. Watershed Inventory Details

There are several ways to count creek assets within a watershed. Entire creeks can be counted as a single asset, or divided into reaches or sub-reaches, and further divided into left bank, right bank, and bed, each being an individual asset. The District's watershed asset register captures bed, left bank, and right bank of each creek sub-reach. Creek reaches and sub-reaches are not consistent lengths, but dependent on stream features such as road crossings and channel type. For example, one mile of creek could be divided into 100 sub-reaches, each with a bed and two banks, resulting in an asset count of 300. The same mile could be divided into only 2 sub-reaches, each with a bed and two banks, resulting in a count of 6. As such, the number of beds and banks in a watershed is not completely indicative of the number of watershed assets, and this plan counts the creeks by miles of creek rather than by number.

Although the District boundary encompasses all of Santa Clara County, the District does not own or manage the entire length of all of the creeks within the county. Typically, the District manages creeks that are on land that that District owns ("Fee"), or property that the District has access to and manages ("Easement"). The District owns and manages approximately 279 miles of the 817 miles of creek in the county. The District owns and manages 83 miles of levees within the 279 miles of managed creek. Table 2.5 presents the total miles of creeks within the county, as well as the total miles of creek per watershed that the District manages and maintains (Fee/Easement).

Table 2-5. Number and Miles of District Creeks and Levees

Watershed	Number of Creeks	Total Miles of Creek	Miles of Creek Fee/ Easement	Miles of Modified (Concrete) Channel	Miles of District-owned Levee	Miles of USACE Levee
Lower Peninsula	22	102	47	12.8	14.6	0
West Valley	21	89.5	49	13.8	19.2	0
Guadalupe	37	124	53	9.3	14.8	12.6
Coyote	41	261	52	5.1	23.3	12
Pajaro	55	241	78	0.1	11.7	2.1
Total	**176**	**817.5**	**279**	**41.1**	**83.6**	**26.7**

The asset count shown in Figure 2-9 summarizes the number of watershed assets divided into categories of land and civil assets. Civil assets include weirs, outfalls, stream gages, and fish passage facilities. There are currently no documented mechanical, electrical, or instrumentation assets in the watershed asset inventory. The asset count does not include the number of channels or creeks, which are instead summarized in Table 2-5. Aside from fish facilities and District owned mitigation land, ecological assets are not included in the count because the program is still being developed.

Figure 2-9. Watershed Asset Count by Asset Type

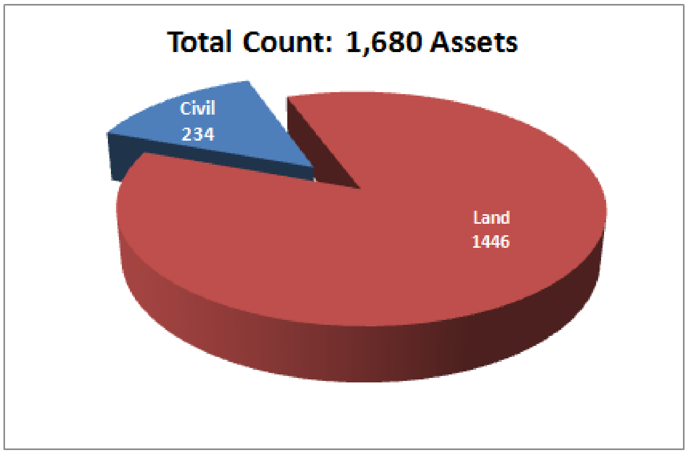


Figure 2-10. Watershed Asset Value by Asset Type

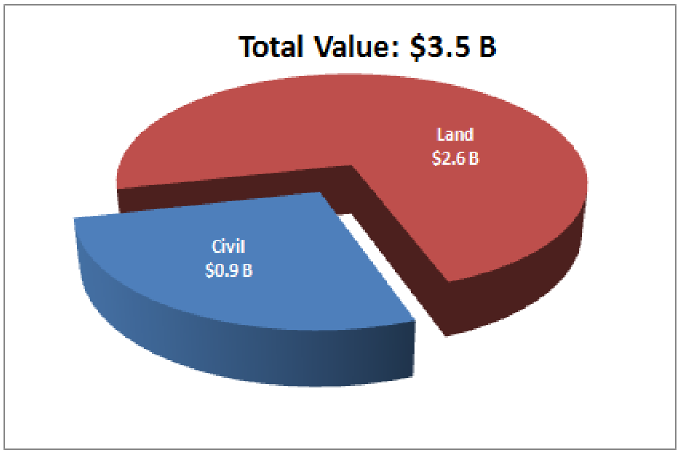


Figure 2-10 illustrates watershed asset value. Channels, levees, and most ecological assets are not included in the value in Figure 2-10; however, the lifetime maintenance costs for these assets are included in the financial projections in Chapter 6. Although levees have a significant value, they are not typically completely replaced, but are maintained and rehabilitated (e.g. rodent hole filling, re-grading, erosion repair). Levee costs are typically estimated by linear foot or cubic foot. A typical levee costs around $18 per cubic yard[1]. Channels are maintained and can be rehabilitated with hardscape (concrete-lined, gabions), but an entire creek channel is not likely to be replaced, like other assets such as a pump. The District is currently working to develop a methodology to value natural assets such as the creek channels and other ecological assets, and to value assets that are not typically replaced such as levees. These values will be included in future plans.

2.4.3. Administration Inventory Details

Figure 2-11 summarizes the number of administration assets by class. Fleet assets include Class I – III vehicles, and all Class IV equipment. The asset count for land is the number of parcels the District owns for administration assets, mainly the land under District buildings. Equipment, Fixtures, and Furniture includes IT hardware, IS software, and radios. The 12 civil assets shown on the figure are the Almaden Campus and Winfield Warehouse buildings.

Not all administration assets were included in the plan, and the total count of 1,533 is low. The Almaden campus building systems, such as HVAC, elevators, and parking lots, were not specifically included in the plan. In future plans, the count of administration assets will increase.

Figure 2-12 summarizes the value of administration assets by class. Land and Civil assets make up most of the value of administration assets. Building replacement costs (civil) make up 32 percent of the total replacement cost. Building replacement costs were calculated by using industry standards of cost per

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[1] To re-build all 83.6 miles of District levees would cost $10 to $20 Million in materials, not including labor, installation, or capital project planning, design, construction management and close-out.

square foot for similar types of buildings in the same region. Fleet assets are the smallest percentage of the total administration asset value, but are the largest percent of the total asset count.

Figure 2-11. Administration Asset Count by Class

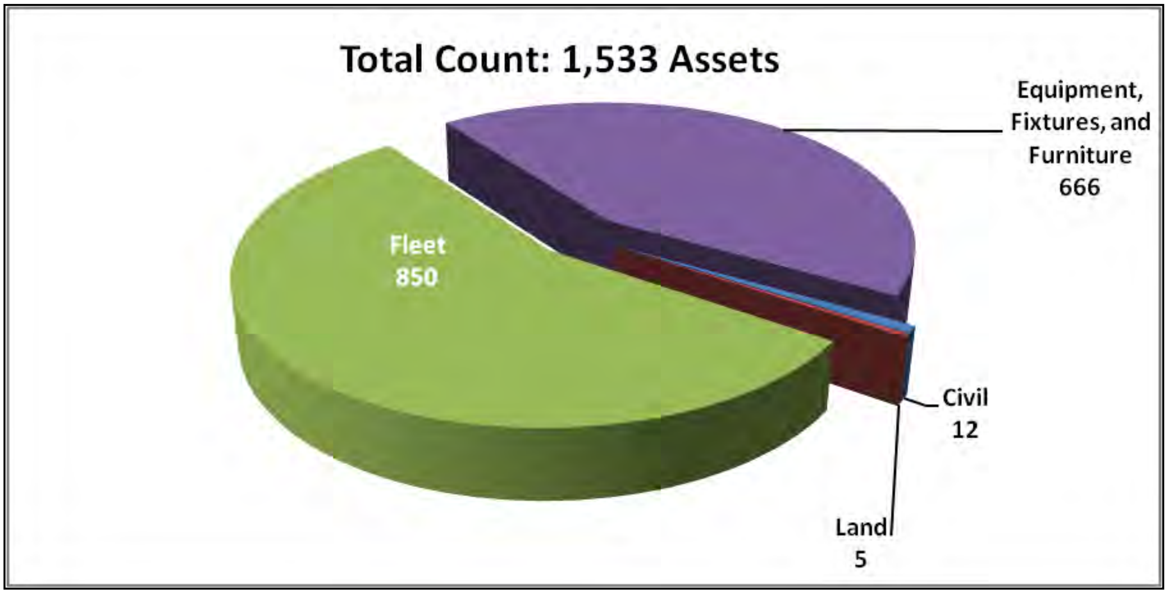
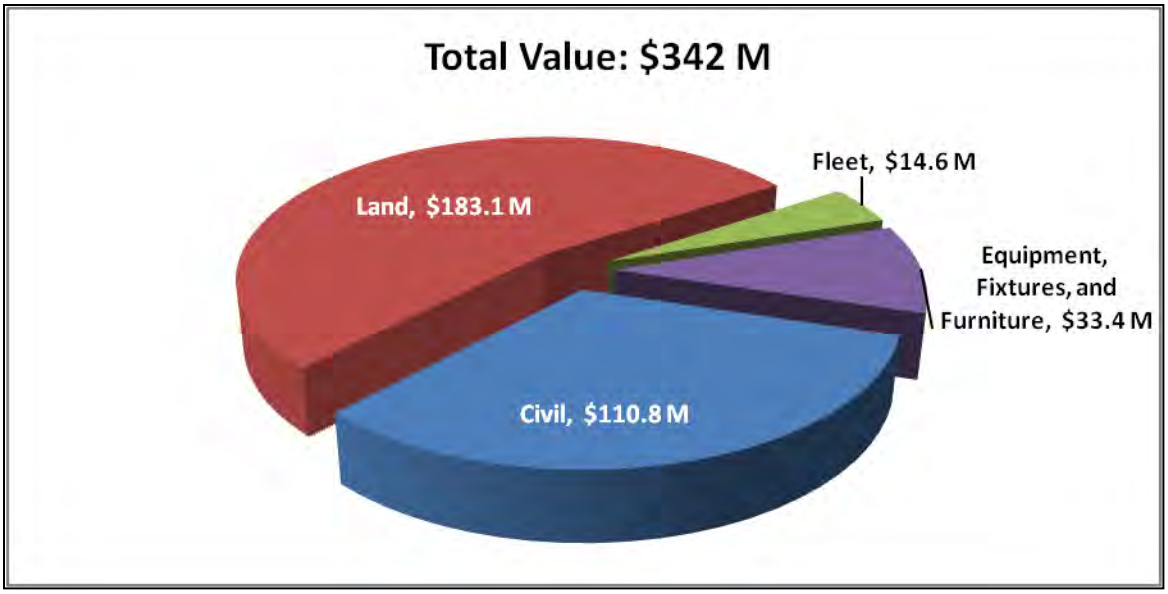


Figure 2-12. Administration Asset Value by Class



2.5. Asset Condition

Asset condition is a measure of the physical state of the assets. Information on asset condition supports effective asset management programs by enabling prediction of maintenance, rehabilitation and renewal requirements. Asset condition is also critical to the management of asset risk, because it relates to the likelihood that the asset will physically fail.

The District's asset condition information is gathered through regular condition assessments. Condition assessments are visual observations of the asset based on criteria specific to that asset class. For example, when assessing a structure, the assessor visually looks at the condition of the foundation, columns, floor, staircase, roof, and external and internal walls. Each criterion is scored on a 1 to 5 scale; 1 being brand new and 5 being complete failure of the asset. Although condition scores are developed using standard criteria, the scoring is somewhat subjective and depends on an individual inspector's judgment.

The District performs regular condition assessments as part of its asset management program. Ideally, assessment frequency should be based on an asset's management strategy. The three District business areas typically perform assessments at different frequencies based on asset type.

2.5.1. Water Utility Condition Details

The District's water utility started its formal condition assessment program in the early 2000's. The Asset Management Unit maintains standard forms that are used to assess equipment. The forms are available via a handheld device for field inspections. The field data is transferred from the handheld devices to Maximo, where it is stored. In general, the program goal is to inspect each asset at a minimum of every two years. The District has kept to this standard in most cases, and inspects its critical assets more frequently. The dams, for example, are inspected more than once a year. In some cases, a two year inspection cycle is not possible. Assets such as conduits and tunnels that have to be dewatered and shutdown for inspection are typically inspected every 5 to 10 years.

Table 2-6 summarizes the most recent condition scores for water utility assets. Note that some assets are missing scores, and land is not scored. The District does not typically assess land condition. Additionally, some of these scores are outdated and have not been updated in 4 to 5 years.

According to the available asset condition data, the majority of the water utility assets are considered to be in good condition, with a condition score of 2 or higher. The assets with a condition score of 3, maintenance required, normally means that the asset will continue to be monitored and is not in need of immediate replacement. The water utility is working to gather more updated condition data and improve the reliability of its condition data.

The majority of water utility assets with a condition score of 5 are lower value, easy to replace assets, such as cathodic protection test stations (53 assets), flow meters (45), and smaller valves (39). Again, a score of 4 or 5 does not always require a renewal project. The District runs some of these assets to failure intentionally.

Table 2-6. Water Utility Asset Condition Summary

Condition Score	No. of Assets	% by No.	Value of Assets	% by Value
1 – Excellent	902	$58,329,000	11%	<1%
2 – Minor Defects	3,477	$3,301,437,000	43%	47%
3 – Maintenance Required	2,277	$2,037,709,000	28%	29%
4 – Major Renewal Required	585	$139,946,000	7%	2%
5 – Unserviceable/Failed	227	$5,535,000	3%	<1%
Land (Not Scored)	300	$915,705,000	4%	13%
Other Not Scored	285	$596,201,000	4%	8%
Total	8,053	$7,054,861,000	100%	100%

2.5.2. Watershed Asset Condition Details

The District's watershed staff performs field inspections as part of its condition assessment program. Inspections are split into two types: levee inspections and creek inspections. Creek inspections are divided into two categories, major and minor; which are determined by their capacity, conveyance, and their risk for flooding. All levees and major creeks are inspected on an annual basis, with the exception of U.S. Army Corps of Engineers (USACE) owned levees. These are inspected twice per year. Minor creeks are inspected every other year. Watershed staff walk these facilities and document site conditions.

The purpose of creek inspections is to identify areas where the structural integrity of creek banks and maintenance roads are at risk, where flows may be obstructed, or where flooding or property damage may occur. Visual inspection categories include erosion, sediment accumulation, woody and trash debris blockage, vegetation, burrowing rodent damage, and miscellaneous property maintenance. Additionally, the following minor maintenance categories are included: trash, homeless encampments, graffiti, damaged fencing, gates, and signage, and access road work.

A watershed inspection report is generated annually for each of the watersheds. The inspection reports identify site conditions along each creek that are scored on an A through E scoring system, which translates to the 1-5 condition scoring system described above, where A indicates a new facility and E indicates an immediate need for corrective action.

Because a creek can be miles long, it is difficult to determine an overall condition score. There may be several spots along a creek that have failed, such as spots with scour along a bank or failing sacked concrete. Where the failing sack or bank scour would receive a score of 5 (failed), or “E” (using watershed scoring convention), the overall sub-reach may receive a condition score of 2 because the other banks along that segment of channel are very stable. These individual failing points along the creek are difficult to roll up to a total score for the entire creek. The District is in the process of developing condition scores at the creek, reach, and sub-reach level, so for this report, watershed condition data is reported using current field inspection data.

Table 2-7 summarizes the data collected from the watershed’s FY14 creek inspection reports. Because the watershed staff ranks creeks and levees using an A - E system, the table uses that same ranking convention, though it can be translated to the 1 – 5 ranking system used for the other business areas; “A” equals “1”, “B” equals “2”, “C” equals “3”, etc. The data presented in this table is the total number for all watersheds combined, representing the District as a whole. Table 2-8 below summarizes the number of site conditions for each creek. These could be used to calculate the number of conditions per mile or per foot to analyze the total health of the creek.

Table 2-7. Watershed Site Condition Summary[2]

Watershed	No. of “A” Condition Sites	No. of “B” Condition Sites	No. of “C” Condition Sites	No. of “D” Condition Sites	No. of “E” Condition Sites	Condition Totals
Lower Peninsula	0	ND	451	260	0	**711**
West Valley	0	ND	471	171	0	**642**
Guadalupe	0	22	129	383	0	**534**
Coyote	0	170	169	837	5	**1,181**
Pajaro	6	381	437	1,131	81	**2,036**

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[2] ND = No Data; Although standard scoring criteria is used, scores are based on individual inspector judgment, and may vary by watershed or creek.

Table 2-8. Summary of Condition Scores per Major Creek

Watershed/Creek	No. of "A" Condition Sites	No. of "B" Condition Sites	No. of "C" Condition Sites	No. of "D" Condition Sites	No. of "E" Condition Sites	Condition Totals
Lower Peninsula Watershed						
San Francisquito Cr	0	ND	26	11	0	**37**
Adobe Cr	0	ND	130	37	0	**167**
Matadero Cr	0	ND	18	38	0	**56**
Permanente Cr	0	ND	113	53	0	**166**
Stevens Cr	0	ND	113	55	0	**168**
Hale Cr	0	ND	16	31	0	**47**
Barron Cr	0	ND	13	15	0	**28**
West Valley Watershed						
Calabazas Cr	ND	ND	ND	ND	ND	**ND**
San Tomas Cr	0	ND	104	78	0	**182**
Regnart Cr	0	ND	34	35	0	**69**
Saratoga Cr	0	ND	129	63	0	**172**
Wildcat Cr	0	ND	87	9	0	**96**
Rodeo Cr	0	ND	25	21	0	**46**
Sunnyvale East Channel	0	ND	26	105	0	**131**
Sunnyvale West Channel	0	ND	5	15	0	**20**
Guadalupe Watershed						
Alamitos Cr	0	5	7	21	0	**33**
Calero Cr	0	ND	17	4	0	**21**
Golf Cr	0	ND	11	15	0	**26**
Guadalupe River	0	3	53	162	0	**218**
Los Gatos Cr	0	ND	20	61	0	**81**
Canoas Cr	0	4	17	104	0	**125**
Greystone Cr	0	ND	12	11	0	**23**
Coyote Watershed						
Coyote Cr	0	98	52	317	0	**467**
Upper Penitencia Cr	0	8	8	36	3	**55**
Upper Silver Diversion	0	3	3	19	0	**25**
North Babb Cr	0	3	3	8	3	**14**
South Babb Cr	0	1	7	21	0	**29**

Watershed/Creek	**No. of "A" Condition Sites**	**No. of "B" Condition Sites**	**No. of "C" Condition Sites**	**No. of "D" Condition Sites**	**No. of "E" Condition Sites**	**Condition Totals**
Lower Silver Cr	0	20	9	52	0	**81**
Miguelita Cr	0	5	4	10	0	**19**
Norwood Cr	0	2	0	14	0	**16**
Quimby Cr	0	0	0	18	0	**18**
Thompson Cr	0	12	27	51	1	**91**
Berryessa Cr	0	0	19	100	1	**120**
Calera Cr	0	2	5	13	0	**20**
Los Coches Cr	0	2	8	21	0	**31**
Lower Penitencia Cr	0	7	8	67	0	**82**
Sierra Cr	0	0	4	26	0	**30**
Pajaro Watershed						
East Little Llagas Cr	1	24	28	28	0	**81**
Lions Cr	1	35	4	102	10	**152**
Llagas Cr	0	71	31	250	35	**387**
Madrone Channel	0	21	20	62	0	**103**
Miller Slough (U. and L.)	0	1	27	22	1	**51**
Morey Channel (N. and S.)	0	5	21	61	3	**90**
Princevalle Storm Drain	0	25	21	25	4	**75**
Tennant Cr	0	8	6	22	3	**39**
West Branch Llagas Cr	0	44	42	183	10	**279**
West Little Llagas Cr	0	41	32	163	14	**250**
Uvas Cr	0	42	169	122	1	**334**
Pajaro River	0	12	10	3	0	**25**
Cochran Channel	0	0	9	25	0	**34**
Coyote Cr (Blossom Hill to Anderson)	0	7	7	12	0	**26**

ND=No data

2.5.3. Administration Condition Details

Administration assets are inspected as needed or required, but the administration business area does not have a formal condition assessment program. Table 2-9 summarizes the available condition scores for administration assets. Note that land and fleet and equipment assets are not scored. Therefore, Table 2-9 only includes scores for IT hardware, information systems, radios, and headquarters and Winfield campus buildings.

Approximately half of the administration assets that have been scored are considered to be in good condition, and about a third are at or near time of replacement. Many of the District's main campus buildings have a condition score of 4, indicating major renewal is required for these assets. These buildings include Winfield Warehouse, Vegetation Management Facility, Maintenance Shops, Maintenance Office Building, Maintenance Annex (Ready Room), and the Fuel Island. Many of these facilities are planned for retrofit or replacement in the next few years, as described in the facilities master plan.

Table 2-10 lists the types of administration assets with a condition score of 5. This indicates that these assets are at the end of their service life or have completely failed and need immediate replacement. PeopleSoft and two asset management databases, ICAM and CARA, are three of the eight software assets that have a condition score of 5. These are currently being replaced. Even though two of the District's three firewall software programs have a score of 5, they are fully functioning and supported, and IT is looking into replacing them within the next 18 to 24 months. As with utility assets, some of these assets are typically run to failure rather than replaced ahead of time.

Table 2-9. Administration Asset Condition Summary

Condition Score	No. of Assets	% by No.	Value of Assets	% by Value
1 – Excellent	32	2%	$19,255,000	6%
2 – Minor Defects	297	19%	$64,833,000	19%
3 – Maintenance Required	87	6%	$20,406,000	6%
4 – Major Renewal Required	110	7%	$33,134,000	10%
5 – Unserviceable/Failed	152	10%	$6,564,000	2%
Land (not scored)	5	0%	$183,141,000	54%
Fleet (not scored)	850	55%	$14,603,000	4%
Total	1533	100%	$341,936,000	100%

Table 2-10. Administration Assets with a Condition Score of 5 (Beyond service life)

Asset Type	No. w/ Condition Score of 5
Firewall	2
Router	25
Server	98
Software	8
Switch	12

2.6. Asset Age

The historical asset installation profile provides insight into the age of assets by showing when assets were installed. Figure 2-13 illustrates the installation profile for all District assets included in this plan. The dollar value is expressed in today's (2014) estimated replacement costs. It does not represent the actual capital investment that took place in any given year. The figure shows the amount of investment (asset installation) per year, represented in 2014 dollars, dating back to the earliest asset installation.

The blue bars on the figure indicate installation of new water utility assets. The largest spike occurs when the majority of the dams were constructed during the 1930's. The second largest spike in 1987 coincides with the construction of Santa Teresa Water Treatment Plant, and Pacheco Conduit and Pump Station. The smaller spikes during the 1950's and 1960's correspond to when pipelines, tunnels, and Rinconada Water Treatment Plant were constructed. Pacheco Tunnel Reach 2 was constructed in 1983, which corresponds to the third largest spike on the graph. The next largest spike occurs in 1974 when Penitencia Water Treatment Plant was constructed. These spikes in utility construction correspond to when various water supplies were developed in Santa Clara County to restore groundwater levels and reduce land subsidence, as shown in Figure 2-14.

The green bars on Figure 2-13 indicate installation of new watershed assets. These new assets coincide with the year when installation of a flood protection or Capital Improvement Project (CIP) related to watersheds was constructed. For example, when a section of natural channel was replaced with concrete lining to stop erosion along the banks, or if a channel was widened to add flood conveyance capacity to protect homes, these are considered "new" watershed assets and are reflected in the chart.

The largest spike in watershed installation in 1971 coincides with the installation of a concrete bottom along Canoas Creek within the Guadalupe Watershed. The second largest spike occurs in 1990 when improvement projects on Matadero Creek, Guadalupe River, and South Babb Creek occurred. It is also interesting to note that during the 1960's, several portions of channels were replaced with concrete linings; namely San Tomas Aquino Creek, Los Coches Creek, and Permanente Creek.

The red bars in Figure 2-13 show that the majority of the Administration installations occur during the late 1990's when the Headquarters Building was constructed and during the 2000's during the technology boom (computer assets). The small spike in 1960 shows when the maintenance building was constructed, and the spike in 1971 shows when the administration building, maintenance shop, and fuel island were constructed.

Figure 2-13. District Asset Installation Profile

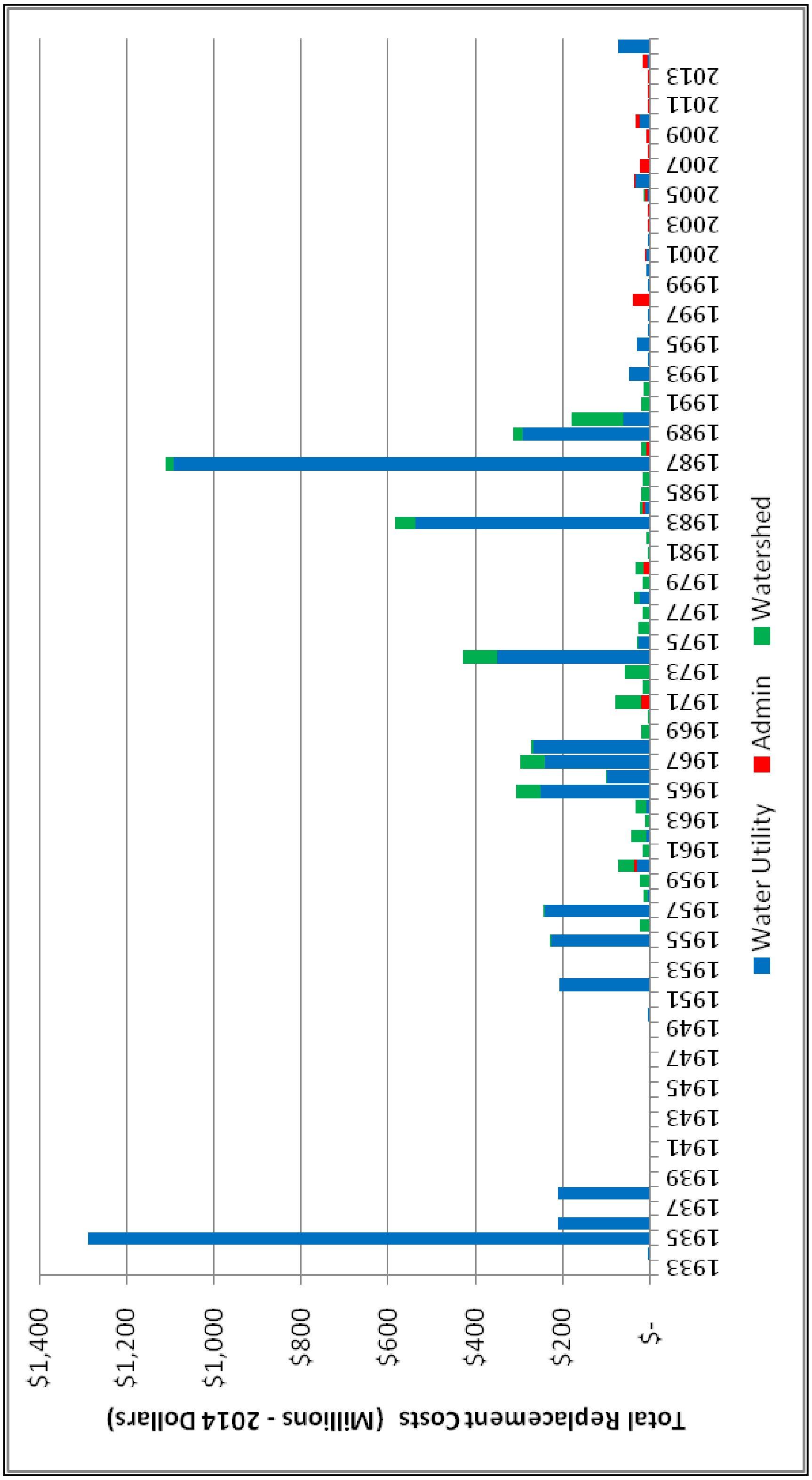
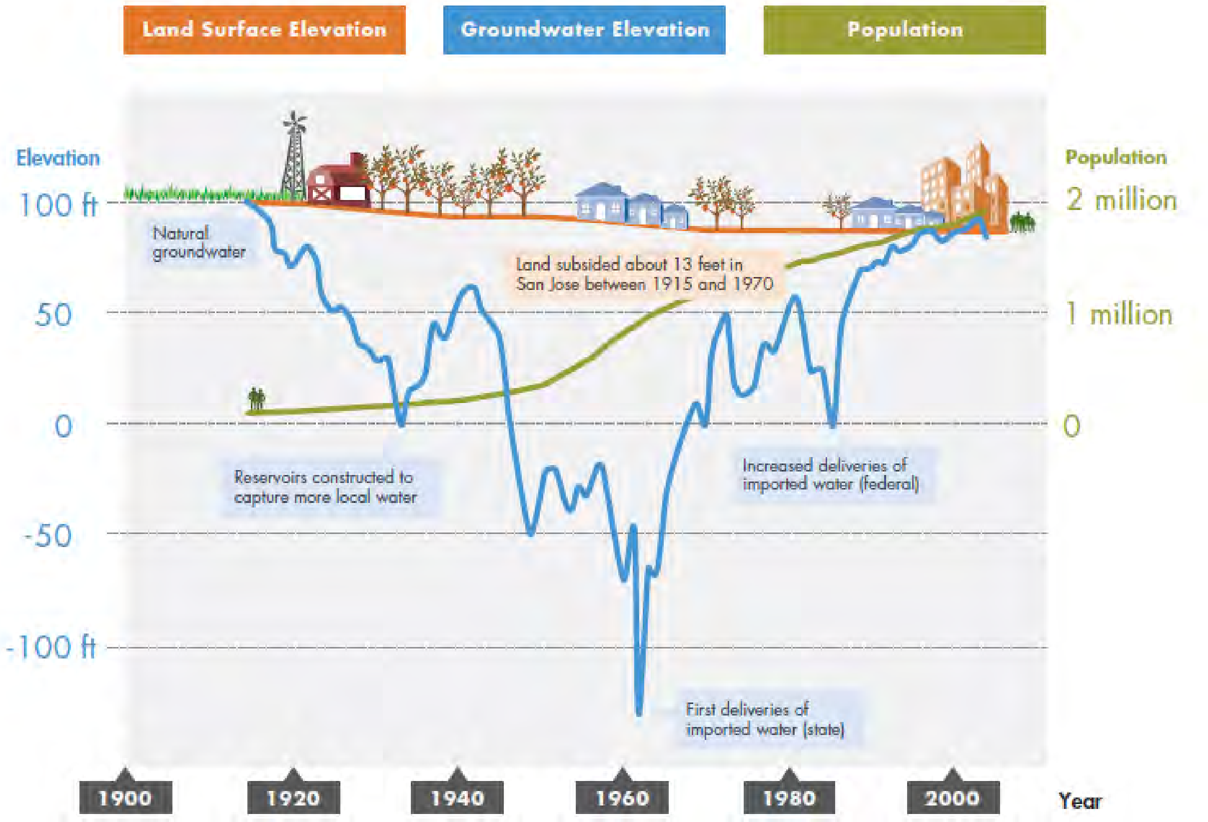


Figure 2-14. History of Water Supply Development in Santa Clara County



2.7. Remaining Life

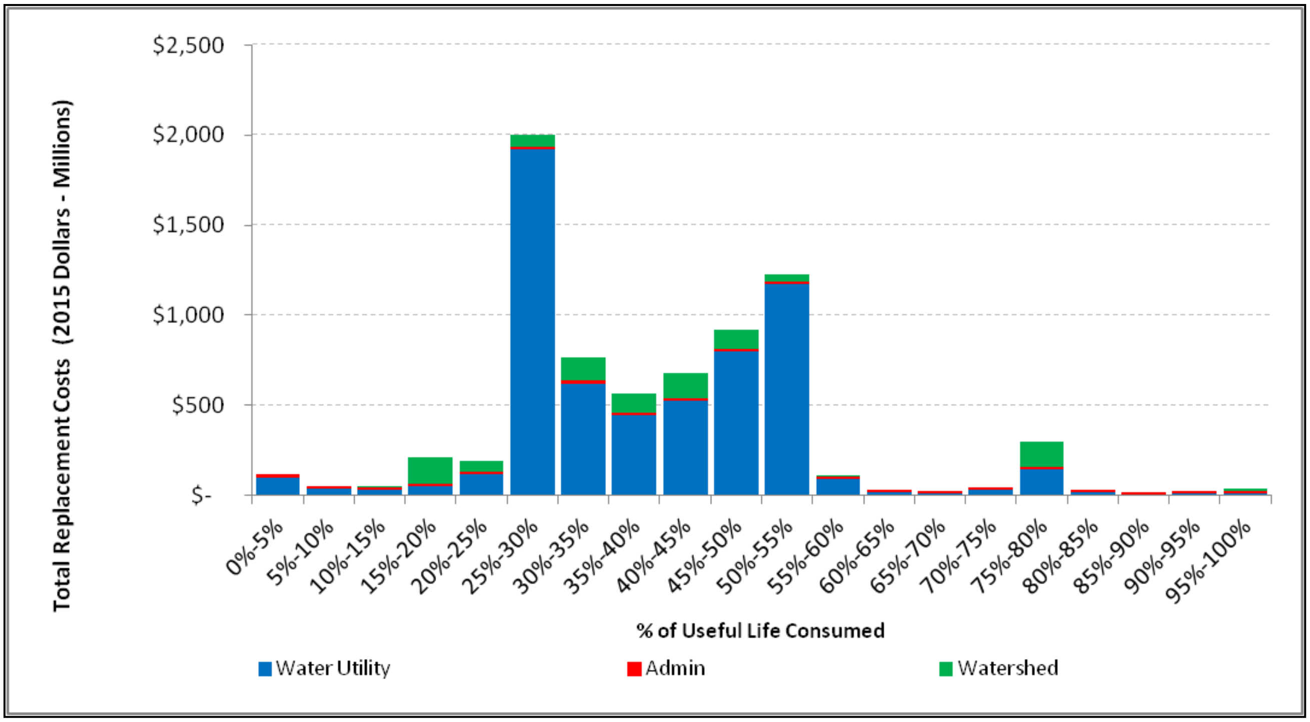
Unlike the installation profile that focuses on the past, the consumption profile focuses on an assessment of the current state of each asset. The consumption profile provides an overview of how much of each asset's life is remaining. The profile provides an indication of the assets reaching the end of their expected life and when they will require replacement.

The consumption profile is calculated using each asset's age and expected life. For example, an asset identified as 0% consumed indicates a new asset, whereas an asset identified as 100% consumed indicates the asset has reached the end of its useful life. Assets with shorter expected lives will be consumed more quickly than assets with longer expected lives.

The District-wide asset consumption profile is presented in Figure 2-15. The dollar value is expressed in 2014 estimated replacement costs. The figure is dominated by water utility assets for the sole reason that the utility assets make up the majority of asset value.

The figure shows that the majority of consumed assets are administration assets. Although these assets may have reached the end of their lives, it does not mean they have completely failed. Some assets extend beyond their expected lives, but are more prone to failure at this point. If the asset is not critical, the District may choose to operate the asset beyond its expected life while continuing to monitor its performance. Since creeks and channels essentially do not have lifecycles, the watershed assets captured in this figure are those assets relating to a creek or channel that do have life spans, such as concrete. The watershed assets shown in this figure are primarily the concrete lined portions of District channels. This figure indicates that the majority of District assets are between 25 percent and 55 percent through their lifecycles.

Figure 2-15. District Asset Consumption Profile



3. Current and Future Levels of Service

Level of service (LOS) is defined as the "quality and quantity of services provided by an asset." Levels of service should be an integral part of an organization's performance management and are fundamental building blocks of asset management. Staff can establish a baseline level of service for an asset against which to compare the existing level of service being provided by that asset and determine if an asset is meeting its established level of service goal.

This chapter documents levels of service (LOS) for the three District business areas. Levels of service can be set external to the organization through regulations, voter approved measures, or contract agreements. Levels of service can also be set internally through policy or internal service agreements. This chapter summarizes both internal and external level of service goals.

This plan makes two assumptions regarding levels of service.

- *This plan does not set new levels of service for District assets.* This plan documents existing levels of service, but does not set new levels of service. Setting levels of service requires considerable collaboration and discussion among District staff and external stakeholders.

- *This plan does not identify or modify levels of service for individual assets.* Identifying level of service for each individual asset requires significant research and analysis of asset design criteria, operations and maintenance data, and interaction with other assets. As such, this plan identifies only a few asset-specific levels of service. The District plans to develop asset-specific levels of service for its critical assets and facilities. Future plans will include these as they become available.

Sections 3.1 through 3.3 discuss high level policies and legislation that prescribe the services provided by the District. Section 3.4 provides information for current levels of service for each business area of the District, and Section 3.5 discusses future levels of service for each business area.

3.1. District Act

The District Act is legislation that created the Santa Clara Valley Water District as a state of California Special District, with jurisdiction throughout Santa Clara County. The introductory paragraph of the original legislation describes the services that the District provides. A portion of the first paragraph is shown below.

"An act to create a flood control district to be called Santa Clara County Flood Control and Water District; to provide for the control and conservation of flood and storm waters and the protection of watercourses, watersheds, public highways, life and property from damage or destruction from such waters; to provide for the acquisition, retention, and reclaiming of drainage, storm, flood, and other waters and to save, conserve, and distribute such waters for beneficial use in said district; …. "

The District Act describes the general services of flood protection and using groundwater for beneficial use in Santa Clara County.

3.2. District Mission and Board Policy

The District's mission and Board Policies provide high level direction on level of service goals for its core business areas. The mission of the District is to *"Provide Silicon Valley safe, clean water for a healthy life, environment, and economy".* The District's vision is to be a fiscally responsible water resources agency valued by the community, though this is under review in the District's ongoing strategic planning process. In order to achieve this mission and vision, the District's Board of Directors adopted Board Governance policies[3] to guide District staff in managing the District's core businesses. The Board Ends policies describe what the Board has directed the CEO to accomplish, and provide guidance on levels of service required by the District's assets.

The first Board Ends Policy (E-1) is the District's mission. The remaining three Board Ends Policies and their associated goals are shown in Table 3-1. Additional detail is available in the BAO-CEO interpretations as objectives, strategies, and outcome measures for the policies and goals, some of which are provided in section 3.4.

3.3. Voter Approved Service Levels

The Santa Clara Valley Water District has two voter approved measures that set levels of service for district assets.

Clean, Safe Creeks

In November of 2000, the voters of Santa Clara County supported a ballot measure entitled the Clean, Safe Creeks and Natural Flood Protection Plan. This program, which created a countywide special parcel tax, included four major outcomes that provide a defined level of service and accomplishments over the course of a 15-year period:

- Flood protection for homes, schools, businesses and transportation
- Clean, safe water in our creeks and bays
- Healthy creek and bay ecosystems
- Trails, parks and open space along waterways

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[3] The most current Board Policies are available at: http://www.valleywater.org/About/BoardPolicies.aspx

Safe, Clean Water

In November 2012, the voters of Santa Clara County supported Measure B, the Safe, Clean Water and Natural Flood Protection Program, an extension of the previous 15-year Clean, Safe Creeks Program. Developed with input from more than 16,000 residents and stakeholders, this 15-year program was created to match the community's needs and values. The Safe, Clean Water and Natural Flood Protection program encompasses five priorities resulting from extensive community outreach surveys:

- Ensure a safe, reliable water supply
- Reduce toxins, hazards and contaminants in our waterways
- Protect our water supply and dams from earthquakes and natural disasters
- Restore wildlife habitat and provide open space
- Provide flood protection to homes, schools, businesses and highways

Similar to the Clean, Safe Creeks Program, the five priorities of Safe, Clean Water provide a basis for setting levels of service within the watershed and water utility businesses.

Table 3-1. District Board Ends Policies

Key Board Ends Policies Defining Levels of Service
E-2: There is a reliable, clean water supply for current and future generations
2.1. Current and future water supply for municipalities, industries, agriculture and the environment is reliable
2.2. Raw water transmission and distribution assets are managed to ensure efficiency and reliability
2.3. Reliable high quality drinking water is delivered
E-3: There is a healthy and safe environment for residents, businesses and visitors, as well as for future generations
3.1. Provide natural flood protection for residents, businesses, and visitors
3.2. Reduce potential for flood damages
E-4: There is water resources *stewardship* to protect and enhance watersheds and natural resources and to improve the quality of life in Santa Clara County
4.1. Protect and restore creek, bay, and other aquatic ecosystems
4.2. Improved quality of life in Santa Clara County through trails, open space, and District facilities
4.3. Strive for zero net greenhouse gas emission or carbon neutrality

3.4. Current Levels of Service

The following sections give an overview of the levels of service guiding current operations of each business area within the District. The District's three business areas strive to meet levels of service set external to the District through permits by regulatory agencies and within contracts with outside agencies. The three business areas also operate to provide levels of service set internal to the District in Board Policy or through internal customer agreements.

3.4.1. Water Utility

The District's water utility provides safe, clean drinking water to residents and businesses throughout Santa Clara County. The water utility sells water to 12 local municipalities and private retailers which, in turn, use treated water and groundwater basins, along with other sources, to deliver drinking water directly to end users.

Some external regulations and agreements that direct the District's water utility operations are provided below. This is not a complete list of regulations and agreements influencing levels of service, and is meant to provide an overview of the external drivers that guide or influence water utility operations. In addition, internal District Board Policy interpretations specifically related to water utility assets are listed below.

Regulations

California Department of Public Health Services

The California Department of Public Health Services exercises regulatory authority for drinking water and recycled water under regulations contained in both Title 17 and Title 22 of the California Code of Regulations. Regulatory oversight includes treated water produced at District water treatment plants, drinking water produced from groundwater wells, water produced at the District's new Advanced Water Purification Center, and water distributed through District owned pipelines.

Division of Safety of Dams

The Division of Safety of Dams is the regulatory body responsible for ensuring that District owned dams are safely maintained and operated in a manner consistent with regulations provided under Title 23 of the California Code of Regulations. The District currently owns 14 regulated dams under licenses granted by the Division of Safety of Dams.

San Francisco Bay/ Monterey Bay Area Regional Water Quality Control Boards

Regional Water Quality Control Boards (RWQCB) operate under regulatory authority provided by Title 23 of the California Code of Regulations and Section 402 of the Federal Clean Water Act. Under Title 23, RWQCBs issue National Pollutant Discharge Elimination System (NPDES) Permits for discharges such as by-pass flows or de-watering of pipelines. RWQCBs also issue Storm Water Pollution Prevention Plan (SWPPP) permits for any activity that requires grading or ground disturbances of more than one acre. These permits affect certain Water Utility capital or maintenance projects.

Agreements

Treated Water Retailer Agreements

The District maintains contracts with its water retailers regarding the quantity and quality of treated water deliveries. The District's water utility and its retailers also defined performance measures for treated water delivery, such as number of unplanned outages per year and maximum duration of unplanned outages; though meeting these performance measures is not contractually required. Similarly, as part of its Infrastructure Reliability Program, the District and its retailers set a level of service goal for water delivery following hazard events such as earthquakes, but this level of service goal is being updated, and is not contractually required. The District strives to meet agreed upon levels of service, whether contractually required or not.

Draft Settlement Agreement

As resolution to a water rights challenge in 2003, the District is drafting a settlement agreement with state and federal environmental regulators as well as local environmental groups. This agreement establishes reservoir operating rule curves that provide water releases for native fisheries in the Coyote, Guadalupe and Stevens Creek Watersheds, and identifies environmental water releases as a beneficial use. This agreement will be finalized pending the completion of the Three Creeks Habitat Conservation Plan and subsequent amendment to District water rights through the State Water Resources Control Board.

Lake and Streambed Alteration Agreements

Lake and Streambed Alteration Agreements (LSAAs) are specific to the operation of particular assets. For example, there is an LSAA for the operation of each reservoir. They typically have a 5-year term and need to be renewed after their expiration date. The District also has a LSAA for the operation of its dams, flashboard dams, and some diversions.

District Board Policy – BAO/CEO Interpretations

BAO/CEO Interpretations of Board Policy include Outcome Measures that clearly define level of service goals for the District. The Outcome Measures (OM) pertaining to water utility facilities and operational activities are listed in Table 3-2. In general, the Outcome Measures help to ensure the District complies with any regulatory or contractual requirements described above, and are reviewed each year and updated as needed. The measures shown here are current as of the report date.

Table 3-2. Selected Outcome Measures: Water Utility

Outcome Measure	Levels of Service Goal
Dams & Reservoirs	
OM 2.1.2.a.	100% of local water identified in annual operations plan utilized to meet annual County water needs.
OM 2.1.2.c.	100% of operational capacity restored at Almaden Reservoir by October 2016.
OM 2.1.2.d.	100% of operational capacity restored at Anderson Reservoir by November 2018, and provide portion of funds, up to $45 M, to help restore full operating capacity of 90,373 feet.
OM 2.1.2.e.	100% of operational capacity restored at Calero Reservoir by December 2019.
OM 2.1.2.f.	100% of operational capacity restored at Guadalupe Reservoir by December 2019.
OM 2.1.2.g.	100% of dams judged safe for continued use following all annual DSOD inspections.
Groundwater Recharge	
OM 2.1.1.a.	Greater than 278,000 ac-ft of projected end-of-year groundwater storage in the Santa Clara Plain.
OM 2.1.1.b.	Greater than 5,000 ac-ft of projected end-of-year groundwater storage in the Coyote Valley.
OM 2.1.1.c.	Greater than 17,000 ac-ft of projected end-of-year groundwater storage in the Llagas Sub-basin.
OM 2.1.1.d.	100% of subsidence index wells with groundwater levels above subsidence thresholds.
OM 2.1.1.e.	At least 95% of countywide water supply wells meet primary drinking water standards.
OM 2.1.1.f.	At least 90% of South County wells meet Basin Plan agricultural objectives.
OM 2.1.1.g.	At least 90% of wells in both the shallow and principal aquifer zones have stable or decreasing concentrations of nitrate, chloride, and total dissolved solids.
OM 2.1.1.h.	Reduce number of private well water users exposed to nitrate above drinking water standards by awarding 100% eligible rebate requests for the installation of nitrate removal systems; a maximum of 1,000 rebates up to $702,000 through 2023.
Pipelines & Tunnels	
OM 2.2.1.a.	100% of annual maintenance work plans completed for all transmission and distribution facilities.
OM 2.2.1.b.	Restore transmission pipelines to full operating capacity of 37 cfs from Anderson Reservoir by 2018.
OM 2.2.1.c.	Restore ability to deliver 20 cfs to Madrone Channel by 2018.
OM 2.3.1.b.	100% of annual maintenance work plans completed for all facilities.

Outcome Measure	Levels of Service Goal
OM 2.3.1.c.	Install 4 new line valves on treated water distribution pipelines by 2027.
Pump Stations	
OM 2.2.1.a.	100% of annual maintenance work plans completed for all transmission and distribution facilities.
OM 2.3.1.b.	100% of annual maintenance work plans completed for all facilities.
Water Treatment Plants	
OM 2.3.1.a.	100% of treated water that meets primary drinking water standards.
OM 2.3.1.b.	100% of annual maintenance work plans completed for all facilities.

3.4.2. Watersheds

Historically at the District, the level of service for a creek was defined only in terms of flood conveyance. However, since the District's watersheds provide services that support all three District Board Ends Policies shown in section 3.2; creek levels of service are now defined in terms of reliable water supply, public safety (flood conveyance), and environmental stewardship. The District manages the creeks to provide capacity to recharge the groundwater aquifer for a reliable water supply, to provide flood protection to the community, and to provide habitat for fish passage and aquatic species, opportunities for trails, improved stream water quality, and other natural resource protection benefits.

The District is in the process of documenting levels of service for each creek and reach. Establishing level of service for a creek requires extensive research into engineering drawings and board approved documents. For this plan, not all creeks have an established level of service. Creeks with established level of service at time of publication of this report include Guadalupe, Stevens, Uvas, Canoas, and Upper Penitencia Creeks. The documented levels of service for these creeks are attached in Appendix Four.

Some external regulations and agreements that direct the District's watershed operations are provided below. This is not a complete list of regulations and agreements influencing levels of service, and is meant to provide an overview of the external drivers that guide or influence watershed operations. In addition, internal District Board Policy interpretations specifically related to watershed assets are listed below.

Regulatory Requirements

The US Army Corps of Engineers, the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and two Regional Water Quality Control Boards all issue permits that allow the District to perform routine maintenance activities within District-owned waterways.

The District's Stream Maintenance Program (SMP)[4] is a 10-year permitting program that guides routine maintenance activities within the District's creeks and canals in an environmentally sensitive manner. It includes permits from the agencies listed above. The District's first SMP began in 2002 and permits for the second 10-year Stream Maintenance Program were obtained in the summer of 2014.

Level of service documentation is required for maintenance guidelines under the District's SMP permit. Identifying the correct level of service is critical. If the wrong level of service is used, maintenance strategies will be inappropriate for the creek or reach. For example, Ross Creek was being maintained to convey 2,200 cubic feet per second (cfs) when its design capacity is only 1,200 cfs.

Contractual Agreements

US Army Corps of Engineers

The District partners with the Corps of Engineers to construct many flood protection projects on its creeks. As a result of these partnerships, the District is required to maintain newly constructed levees and other assets according to standards set by the Corps of Engineers.

Trails and Open Space Agreements

The District enters into many joint-use agreements with cities and the county to provide trails and open space along creeks and streams throughout the county. These agreements set standards for providing miles of trails and acres of open space throughout the county.

Project Specific Agreements

As part of some Capital Improvement Projects, the District enters into agreements with other entities for use of land or for other project specific purposes. One example of such an agreement is for use of City of Mountain View's McKelvey Park and County of Santa Clara's Rancho San Antonio Park as flood detention basins as part of the Permanente Creek Flood Protection Project.

District Board Policy – BAO/CEO Interpretations

BAO/CEO Interpretations of Board Policy include Outcome Measures that clearly define level of service goals for watershed operations and maintenance. Many of the Outcome Measures (OM) pertaining to Ends Policies E-3 and E-4 are listed in Table 3-3. See section 3.4.1 for outcome measures pertaining to Ends Policy E-2. In general, the Outcome Measures are developed to ensure the District complies with any regulatory or contractual requirements described above. Again, the measures shown here are current as of May 2014.

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[4] For more information see http://www.valleywater.org/Services/StreamMaintenanceProgram.aspx

Table 3-3. Selected Outcome Measures: Watersheds

Outcome Measure	Levels of Service Goal
Provide Natural Flood Protection	
OM 3.1.1.a.	Approximately 31,500 parcels are protected and/or eligible for removal from the flood hazard zone as specified in the 5-year Capital Improvement Plan.
OM 3.1.1.b.	With federal and local funding, construct a flood protection project on Upper Penitencia Creek to provide 1% flood protection to 5,000 homes and public buildings by 2026.
OM 3.1.1.c.	With local funding only, acquire all necessary right-of-ways and construct a 1% flood protection project on Upper Penitencia Creek from Coyote Creek confluence to King Road by 2026.
OM 3.1.1.d.	With federal and local funding, protect more than 3,000 parcels by providing 1% flood protection on San Francisquito Creek by 2020.
OM 3.1.1.e.	With local funding only, protect approximately 3,000 parcels from flooding (100-year protection downstream of HWY 101, 50-year protection upstream of HWY 101) on San Francisquito Creek by 2020.
OM 3.1.1.f.	With federal and local funding, provide flood protection to 1,100 homes, 500 businesses, and 1,300 agricultural acres, while improving stream habitat on Upper Llagas Creek by 2017.
OM 3.1.1g.	With local funding only, provide 100-year flood protection for Reach 7 only (up to W. Dunne Avenue in Morgan Hill) on Upper Llagas Creek by 2017. A limited number of homes and businesses will be protected.
OM 3.1.1.j.	With federal and local funding, construct a flood protection project on Upper Guadalupe River to provide 1% flood protection to 6,280 homes, 320 businesses, and 10 schools and institutions by 2019.
OM 3.1.1.k.	With local funding only, construct flood protection improvements along 4,100 feet of Guadalupe River between SPRR crossing, downstream of Willow Street, to UPRR crossing, downstream of Padres Drive by 2019. Flood damage will be reduced; however, protection from the 1% flood is not provided until completion of the entire Upper Guadalupe River Project.
OM 3.1.1.l.	100% of flood protection projects include multi-purpose objectives that enhance ecological functions, improve water quality, or provide for trails & open space.
OM 3.1.1.n.	Update floodplain maps on a minimum of 2 creek reaches in accordance with new FEMA standards by 2022.
OM 3.1.2.a.	50% of assets are assessed and have their condition documented annually.
OM 3.1.2.b.	100% of levees inspected and maintained annually.
OM 3.1.2.c.	Maintain 90% of improved channels at design capacity.

Outcome Measure	Levels of Service Goal
OM 3.1.2.d.	Complete a minimum of 2,900 acres of upland and in stream vegetation management in all watersheds annually.
OM 3.1.2.e.	100% of maintenance projects comply with the Stream Maintenance Program permit best management practices.
OM 3.1.2.f.	100% of stream bank erosion sites on District property are repaired that pose an imminent threat to public safety.
OM 3.1.2.g.	Construct 3 geomorphic designed projects to restore stability and stream function by preventing incision and promoting sediment balance throughout the watershed by 2021.
OM 3.1.2.h.	Provide vegetation management for 6,120 acres along levee and maintenance roads through 2028.
OM 3.1.2.i.	Maintain a minimum of 300 acres of revegetation projects annually to meet regulatory requirements and conditions through 2028.
Protect and Restore Creek, Bay and Other Ecosystems	
OM 4.1.1.a.	Establish new or track existing ecological levels of service for streams in 5 watersheds by 2028.
OM 4.1.1.b.	Re-assess streams in 5 watersheds to determine if ecological levels of service are maintained or improved by 2028.
OM 4.1.1.c.	Fish tissue concentration of methyl mercury that meets Total Maximum Daily Load (TMDL) objectives (target = 1.5 ng total methyl mercury per/liter water).
OM 4.1.1.d.	Five watersheds meet all Stream Maintenance Program and other mitigation commitments including the management of 300 acres of existing revegetation plantings.
OM 4.1.1.e.	Respond to requests on litter or graffiti cleanup within 5 working days through 2028.
OM 4.1.1.f.	100% of pesticide products used in lowest toxicity category.
OM 4.1.1.g.	Operate and maintain existing treatment systems in 4 reservoirs to remediate regulated contaminants, including mercury through 2028.
OM 4.1.1.j.	Install at least 2, by 2014, and operate 4, through 2028, trash capture devices at stormwater outfalls in Santa Clara County.
OM 4.1.1.k.	Perform 52 annual clean-ups for the duration of the Safe, Clean Water program to reduce the amount of trash and pollutants entering the streams.
OM 4.1.1.l.	Conduct 60 clean-up events (4 per year) through 2028.
OM 4.1.1.m.	Provide up to $8 Million for the acquisition of property for the conservation of habitat lands, total through 2028.
OM 4.1.2.a.	Establish agreement with the US Fish and Wildlife Service to reuse sediment at locations to improve the success of Salt Pond restoration activities by 2017.
OM 4.1.2.b.	Update 3 creek hydrology models annually.

Outcome Measure	Levels of Service Goal
OM 4.1.2.d.	Revitalize at least 21 acres guided by the 5 Stream Corridor Priority Plans, through native plant revegetation and removal of invasive exotic species by 2028.
OM 4.1.2.h.	Construct one creek/lake separation project in partnership with local agencies by 2019.
OM 4.1.2.i.	Use $6 Million for fish passage improvements through 2019.
OM 4.1.2.k.	Install large woody debris and/or gravel at a minimum of 5 sites (1 per each of 5 major watersheds) by 2019.
OM 4.1.2.l.	Construct site improvements up to $4 Million to allow for transportation and placement of future sediment by 2017.
OM 4.1.3.a.	Three in-stream habitat features protected by December 31, 2017.

3.4.3. Administration

The administration business area provides services that support the water utility and watershed businesses, and its main goal is to serve customers in a safe, effective, and fiscally responsible manner. Since the administration business area primarily provides internal services, its levels of service are internal goals. However, a few external regulations guide some areas of the District's administration operations, listed below.

Unlike water utility and watershed business areas, District Board Policy does not directly identify outcome measures or specific level of service goals for administration assets. Instead, the administration business area develops internal service goals for its customers.

Regulatory Requirements

Building Codes and Permits

Facilities assets such as the District headquarters campus buildings are subject to building codes and the District is required to obtain building permits for any major modifications to its facilities. One critical system regulated by building codes is fire prevention systems. These systems must be tested and maintained regularly.

Several building systems require annual or multiyear permitting inspections. These systems include elevator, fire suppression, and cafeteria equipment. These permits are maintained by the Facilities office.

ADA Requirements

District buildings are required to meet requirements of the Americans with Disabilities Act. The act sets standards for accessible design for new construction and building improvements. The act requires such design features as ramps for wheelchair access, sufficient parking for disabled persons, and accessible restroom facilities.

Internal Level of Service Goals

Although District Board Policy does not identify specific level of service goals for the administration assets, the administration business areas have developed internal service goals for their projects and programs in order to better serve District staff and successfully support the water utility and watershed businesses. Table 3-4 presents some internal level of service goals for each of the administration's asset types.

Table 3-4. Administration Internal Level of Service Goals

Asset Class	Level of Service Goal
Buildings & Grounds (Facilities)	To increase the effectiveness of District staff by providing building services, facilities project management, and space planning/management while ensuring that public funds are used efficiently and effectively.
Fleet	To provide safe, effective, dependable, and economical transportation to employees while in the course of conducting District business.
Information Technology (IT)	To provide and maintain support of Network Administration, Data Center Operations and Administration, Microcomputer Hardware/Software Installation, District Two-way Radio Operations, Audio/Visual Systems, Help Desk support and Telecommunications services
Information Systems Solutions (ISS)	To provide database administration and development, application development and Intranet/Internet services.

3.5. Future Levels of Service

The District sets future level of service goals through its master planning efforts. The water utility's future level of service goals are identified in the 2012 Water Supply and Infrastructure Master Plan (Water Master Plan). The Water Master Plan documents future water supply needs for Santa Clara County, and indicates that the county's baseline water supplies are sufficient to meet future demands through 2035, with the exception of drought conditions. Droughts are the District's main water supply challenge.

The Water Master Plan identified a future level of service goal to develop water supplies to meet at least 100 percent of average annual water demand identified in the District's Urban Water Management Plan during non-drought years and at least 90 percent of average annual water demand in drought years. The plan recommends investments in sustainable water supplies such as recycled water to address this challenge. The recommended investments including use of advanced treated recycled water to recharge the groundwater aquifer via recharge ponds are incorporated into this plan as future capital investments.

Similar to water utility efforts, the watershed business area is embarking on master planning efforts to determine if changes to current service levels for flood protection or stream stewardship are needed in the future. The District is currently working on a integrated water resources master plan that will identify future goals for water supply, flood protection, vegetation, fisheries, wildlife, water quality, open space, and trails and recreation for each District watershed.

In the administration business area, the facilities management unit has developed a campus master plan that identifies future level of service goals for the District's headquarters campus. The campus master plan identifies several building upgrade or replacement projects. The information systems solutions unit developed an information systems master plan in 2012, and has been working to implement the plan since that time. The plan sets future goals for information systems and technology services, such as eliminating one-of-a-kind solutions and implementing more enterprise wide systems such as Maximo. The improvement projects identified in the campus and information systems master plans are included in this plan as current or future capital investments.

4. Business Risk Exposure

Risk for District assets is measured by estimating the likelihood and consequence of an asset failure occurring. Risk is the result of uncertainty. It is impossible to know when or where a failure may occur, therefore the likelihood of its occurrence needs to be estimated. Risk management processes can help to identify District's higher risks, determine which are unacceptably high, and identify actions necessary to mitigate those risks.

Risk is a key element of asset management. It can help prioritize budgets and resources. The objectives of a risk assessment are to:

- Identify assets representing the greatest risk to service delivery or public safety
- Highlight assets requiring detailed condition assessment or renewal
- Prioritize work and resources
- Develop and apply appropriate risk management strategies

This chapter provides a brief summary of the methodology used to assess risk for District assets. It also presents the District's risk profile, based on current data. The data used to create the risk profile for this plan is not complete, and needs to be updated. Therefore, the risk profile presented herein is not completely accurate. The District intends to collect more reliable and accurate risk data over the next few years in order to create a more meaningful risk profile.

4.1. Business Risk Exposure Methodology and Assumptions

The District recently restructured its risk methodology to be applicable to all District business areas. The risk methodology derives a risk score from the multiplication of two factors: probability of failure (PoF) and consequence of failure (CoF)[5]. The outcome is a Business Risk Exposure (BRE) score. Figure 4-1 depicts how consequence of failure and probability of failure affect total risk, and how risk is generally managed depending upon where it sits in the profile.

In the District's risk profile, the CoF index ranges from 0 to 30, with 30 being the greatest consequence of failure. CoF scores are determined using a matrix. A sample matrix is shown in Figure 4-2. Note that this matrix is currently being updated and standardized for use in all three District business areas.

The PoF index ranges from one to five, with five being the most likely to fail. The PoF index is determined from the condition assessment score described in Chapter 2.

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[5] The Business Risk Exposure calculation also includes a redundancy factor. The District's Asset Management Program has not deployed the use of the redundancy factor in the risk calculation and plans to do so in the next few years to improve the reliability of risk scores.

The Business Risk Exposure (BRE) scores for District assets can, therefore, range from 1 to 150 (PoF = 5 x CoF = 30), with 150 being the most at-risk asset. Assets are divided into three categories of risk: low, moderate, and critical. The BRE scores for these categories are as follows:

- Low risk = 1 – 50
- Moderate risk = 51 – 60
- Critical risk = 61 – 150

Assets with a score greater than 60 fall in the critical risk category. Scores below 50 indicate an asset either has a probability of failure lower than 3, a very low consequence of failure, or both. The low risk threshold of 50 was determined using engineering judgment, and seems to be an appropriate threshold. The critical risk threshold of 60 was selected based on past experience, but may need to be revised since it is not even half of the total risk index of 150. Additionally, 51-60 may be too small a range for moderate risk assets. Consequently, these thresholds will be evaluated and will likely change in the future.

Figure 4-1. Business Risk Exposure Methodology

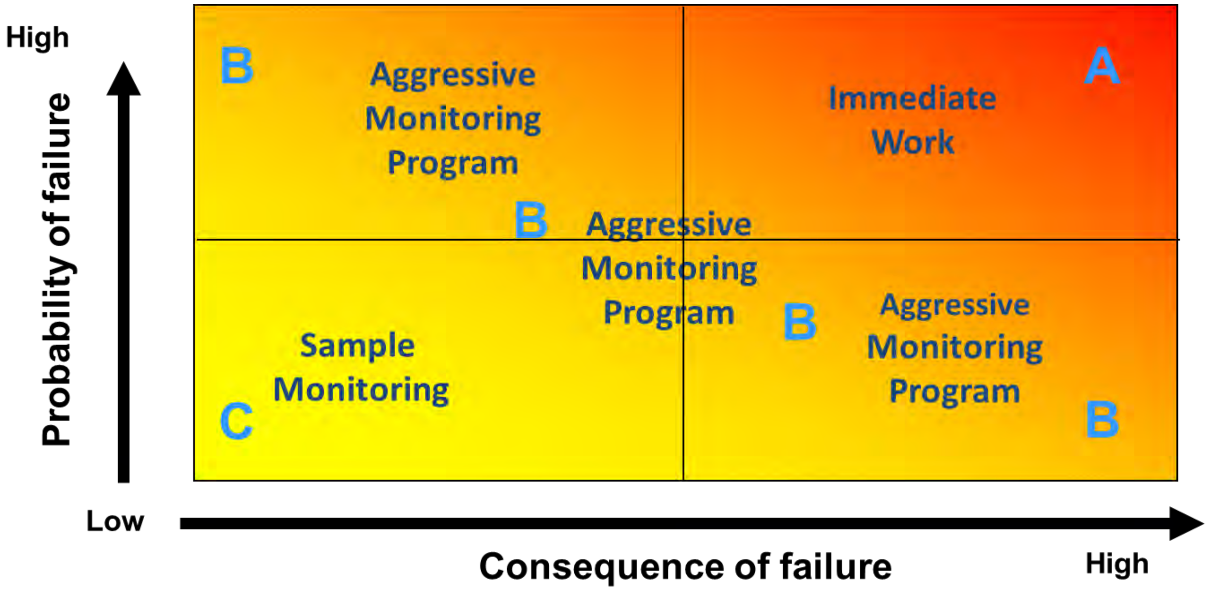

Figure 4-2. Sample Consequence of Failure Matrix

	Impact	Not Applicable	Very Low	Low	Medium	High	Critical
	Score->	0	1	2	3	4	5
Components	Subcomponents						
Social **(Score 0 to 10)**	Service Delivery	No impact	Failure of asset results in **short term (< 30 days), local reduction** in service delivery	Failure of asset likely to result in **long term (> 30 days), local reduction** in service delivery	Failure of asset likely to result in **short term (<30 days), wide spread reduction** in service delivery	Failure of asset likely to result in a **long term (> 30 days), localized total loss** in service delivery	Failure of asset likely to result in a **long term (> 30 days), wide spread total loss** in service delivery
	Impact to Community Property	No impact/ damage	Failure of the asset results in **minor, localized damage** to community property	Failure of the asset results in **minor, wide spread damage** to community property	Failure of asset results in **major, localized damage** to community property	Failure of asset results in **major, wide spread damage** to community property	Failure of asset results in **catastrophic, wide spread damage** to community property
Environmental **(Score 0 to 10)**	Environmental Impacts	No impact	Failure of the asset does **minor** environmental damage	Failure of asset liley to cause non-lasting **(short term) repairable damage** and expect recovery within one year	Failure of asset likely to cause medium-term repairable damage and expect **recovery within 3 years**	Failure of asset likely to cause long-term repairable damage and recovery requires **more than 5 years** and may significantly compromise habitat	failure of the asset likely to cause environmenatl damage with lasting consequences (permanent change to habitat) and **permanent damage to habitat**
	Life Safety	No Impact	Failure of the asset results in **minor** reportable injuries	Failure of asset results in **significant** reportable injuries	Failure of asset results in **short-term** disabilities	Failure of asset results in **long-term** disabilities	Failure of asset likely to result in **death**
Economic **(Score 0 to 10)**	Financial Impact	No impact	Failure of asset results in **<$10,000** rehab/replacement/penalty cost	Failure of asset results in **$10,000 - $50,000** rehab/replacement/penalty cost	Failure of asset results in **$50,000 - $100,000** rehab/replacement/penalty cost	Failure of asset results in **$100,000 - $500,000** rehab/replacement/penalty cost	Failure of asset results in **<$500,000** rehab/replacement/penalty cost
	Impact to Reputation	No impact	Failure of asset likely to cause minor impact to reputation	Failure of asset likely to cause public complaints to District	Failure of asset likely to get attention of Board Members	Failure of asset likely to create negative media coverage	Failure of asset likely to bring criminal charges to District

4.2. District Risk Profile and Management

The Business Risk Exposure (BRE) scores for District assets can range from 1 to 150 (PoF = 5 x CoF = 30), with 150 being the most at-risk asset. Currently, the highest risk score for any District asset is 130 (based on available data). Two water utility assets currently have this score, as shown in Section 4.2.1.

Table 4-1 summarizes District assets by number and value for each risk area: low, moderate, and critical. The table shows that 80 percent of District assets that have been scored have been identified as low risk and these make up 22 percent of the overall asset value. 78 percent of assets by value are in the moderate to high risk categories. Note that these numbers are based on available data, and will be updated and validated.

Table 4-1. District Risk Profile Summary

Risk Level	No. of Assets*	% by Number	Value of Assets	% by Value
Low	6857	85%	$1,338,081,000	22%
Moderate	716	9%	$2,321,477,000	39%
Critical	574	7%	$2,326,902,000	39%

*Land, Watershed, and assets missing condition scores are not included. See section 4.2.2 for watershed asset risk information.

4.2.1. Water Utility

The District has risk data for 7,468 of 8,053 water utility assets. 83 percent of these 7,468 assets fall in the low risk category, but only account for 22 percent of the total water utility asset value, as shown in Table 4-2. Only 16 percent of the water utility assets have a moderate to high risk level. These account for almost 80 percent of the total utility asset value. Again, this risk assessment information is based on the latest documented scores, which need to be updated and validated.

The high value water utility assets such as dams and pipelines will typically fall in the moderate to critical risk category. These assets have a very high consequence of failure (25 – 30, typically), so even if the condition is good or average (2 – 3), the total risk score will fall in the 50 – 90 range. Because of the high consequence of failure, these assets need to be monitored closely to ensure replacement or rehabilitation occurs before failure.

Table 4-2. Water Utility Risk Profile Summary

Risk Level	No. of Assets	% by Number	Value of Assets	% by Value
Low	6,186	83%	$1,298,885,000	22%
Moderate	712	9%	$2,320,677,000	39%
Critical	570	7%	$2,323,802,000	39%

Table 4-3 provides a list of the ten highest risk score assets for the water utility, based on available data. The table includes risk scores, replacement costs, and risk mitigation strategies associated with each high risk asset, if one exists. Notice that many of the assets do not currently have a replacement scheduled because the risk scores need to be verified prior to moving forward with an asset renewal project.

Table 4-3. High Risk Water Utility Assets and Mitigation Strategies

Rank	Asset Description	PoF	CoF	BRE	Replacement Cost	Risk Mitigation Strategy
1	West Pipeline Mann Turnout Guard Valve	5	26	130	$12,000	Scheduled Replacement TBD*
2	Santa Clara Distributary Corrosion Control Rectifier	5	26	130	$8,100	Scheduled Replacement TBD*
3	Central Pipeline 48" Motor Operated Butterfly Valve - Vault 903	5	25	125	$120,000	Scheduled Replacement in 2017
3	Rinconada Force Main 48" Motor Operated Butterfly Valve 901	5	25	125	$120,000	Scheduled Replacement TBD*
4	Vasona Canal Sluice Gate Outlet Pipe	5	25	125	$1,000,000	Scheduled Replacement TBD*
5	Anderson Dam Structure	4	30	120	$300,000,000	Current CIP Completion in 2018
6	STWTP Panelboard ATS 2 – 5	4	27	108	$31,500 (each)	Scheduled Replacement TBD*
7	Santa Teresa Tunnel	4	27	108	$ 22,232,000	Inspect Tunnel in 2016
8	Almaden Valley Pipeline 54" Motor Operated Butterfly Valve – Shannon Line Valve	4	27	108	$132,000	Scheduled Replacement TBD*
9	PWTP Clearwell 48" Inlet Valve	4	26	104	$132,000	Scheduled Replacement in 2022. Monitor for worsening condition.
10	PWTP Clearwell 36" Outlet Valve	4	26	104	$132,000	Scheduled Replacement in 2022. Monitor for worsening condition.

*Risk score needs to be verified before a replacement project is scheduled.

4.2.2. Watersheds

The District is currently working on establishing risk (BRE) scores for each creek, reach, and sub-reach. The District has developed consequence of failure (CoF) scores for all creeks at the creek, reach and sub-reach level, but has not developed probability of failure (PoF) data at these levels. As described in Section 2.5.2, it is difficult to determine an overall condition score, or PoF, for a creek because there may be several spots along a creek that have failed, while the overall creek or reach may be in good condition. The District is in the process of developing PoF scores for each creek, reach, and sub-reach. Once these scores are developed, the District will be able to estimate BRE of each creek.

At this time, the District has BRE scores for distinct spots along creeks that are exhibiting evidence of failure. The creek inspectors maintain PoF data for specific point locations that they are monitoring for worsening conditions. A list of the watershed business area top ten high risk sites is provided in Table 4-4. This list is based on current conditions, and will change frequently. The table provides the site location, type of condition, and proposed strategy for addressing the risk.

Table 4-4. Watershed Top Ten High Risk Sites

Ranking	Site Location	Condition	Management Strategy
1	San Tomas Creek @ Old Mtn. View-Alviso Rd	Sediment Accumulation	SMP Project
2	Stevens Creek @ Crittenden	Sediment Accumulation	SMP Project
3	Coyote Creek @ Hwy 237	Bank Erosion	CIP
4	Coyote Creek: Montague Expwy to Hwy 880	Vegetation Removal	SMP Project
5	Regnart Creek: Bubb to Stelling	Bank Erosion	CIP
6	Guadalupe River d/s Hwy 101	Vegetation Removal	SMP Project
7	Thompson Creek @Aborn	Bank Erosion	CIP
8	Saratoga Creek d/s Cox Ave.	Bank Erosion	SMP Project
9	Llagas Creek u/s Hwy 152	Vegetation Removal	SMP Project
10	Upper Penitencia Creek: Hwy 680 to King	Sediment Accumulation	SMP Project

Creek CoF scores range from 6 to 25. Table 4-5 identifies the range of CoF scores for different reaches of selected major creeks. This table is intended to show a sampling of creeks, and is not inclusive of all creeks, though data is available for each creek.

Table 4-5. CoF Score Range for Selected Creeks

Creek	CoF Range (Scale of 1 to 30)
Adobe	6 - 22
Alamitos	10 - 17
Barron	13 - 20
Berryessa	10 - 21
Calabazas	6 - 20
Canoas	15 - 18
Coyote	13 - 22
Guadalupe	12 - 25
Llagas	10 - 17
Los Gatos	7 - 17
Lower Silver	7 - 18
Matadero	7 - 20
Permanente	6 - 19
Ross	14 - 20
San Francisquito	8 - 21
San Tomas Aquino	10 - 20
Saratoga	6 - 17
Stevens	9 - 24
Thompson	9 - 18
Upper Penitencia	12 - 18
Upper Silver	12 - 18

4.2.3. Administration

The District has risk scores for 678 of the 1,533 administration assets. Of this 678, almost all fall in the low risk category, as shown in Table 4-6. There are six assets considered to have a moderate to high risk level, all of which are software assets and are listed in Table 4-7, along with risk scores, replacement costs, and mitigation strategies for renewal. It should be noted that although the District's Administration building risk score did not fall in the moderate or high risk category, the building is considered one of the District's higher risk assets, and will soon be replaced.

The administration assets having a Probability of Failure (PoF) score of 5 are not necessarily assets that have completely failed. For IT and IS assets, a PoF score of 5 indicates that the asset has reached the end of its useful life or has outdated technology, and needs to be replaced or updated with a current version. While the District clearly sees information technology as critical for business operations, it has not conducted the same level of lifecycle planning as it has with its water utility assets.

As a result, a number of teh District's software systems (such as PeopleSoft) and technology infrastructure (such as servers) have not been kept current. Although the consequence of failure index is low when compared to water utility assets whose failure could cause loss of potable water supply, or watershed assets whose failure could cause severe flooding; failure of IT assets would significantly impact the District's ability to conduct business. The District has not historically planned for, or allocated budget to replace these assets. Funds have been allocated to higher priority replacements in other business areas.

Table 4-6. Administration Risk Profile Summary

Risk Level	No. of Assets	% by Number	Value of Assets	% by Value
Low	670	99%	$140,291,000	98%
Moderate	4	<1%	$800,000	<1%
Critical	4	<1%	$3,100,000	2%

Table 4-7. High Risk Administration Assets and Mitigation Strategies

Rank	Asset Description	PoF	CoF	BRE	Replacement Cost	Risk Mitigation Strategy*
1	PeopleSoft	5	15	75	$2,800,000	Upgrade Scheduled
2	Engr. Drawing Catalog System (EDCAT)	5	13	65	$100,000	Replace
3	Budget Tool	4	15	60	$500,000	Replace w/Hyperion
4	Phone Database	4	15	60	$100,000	Replace w/Active Directory
5	CIP Dashboard	4	13	52	$100,000	Evaluate Replacing w/ PeopleSoft
6	CPAR	4	13	52	$100,000	Evaluate Replacement

*Risk Mitigation Strategies are recommendations taken from the July 2012 Information Systems Master Plan
** In addition to the assets and strategies listed here, the District's administration buliding mentioned above will be replaced in the next few years

4.3. Planned Improvements to Risk Analysis

In developing this plan, it became evident that the risk data available at this time is not reliable. Consequently, a major goal for the District's Asset Management Programs in the next few years is to develop more reliable risk scores and a valid risk profile. The plan identified three distinct areas of improvement regarding risk:

1. Update and validate risk scores: Several risk scores (CoF, PoF, or both) are missing, and several have not been updated for many years. The Asset Management Unit will develop scores for assets without scores, and will update and validate scores for assets with old scores. Additionally, the Asset Management Unit will deploy the use of the redundancy factor in the risk calculation.

2. Standardize risk scores across all business areas: Several different CoF matrices were being used throughout the District. The Asset Management Unit is working to standardize the CoF matrix so that all assets can be scored using the same criteria. Risk scores need to be standardized across business areas so that, for example, a software program does not receive the same score as Anderson Dam. When one group of assets, such as software, is scored relatively to other software and independently of all other District assets, risk scores can be artificially inflated.
3. Review and update risk thresholds: Currently, a risk score of 60 indicates a high or critical risk asset. This threshold may be low, since it is less than half of the total scoring scale of 150. Additionally, the thresholds for moderate risk may need to be widened. It currently makes up only 10 points of the 150 point scale.

5. Management Strategies

This chapter provides background on management strategies and an overview of the management strategies currently in place for District assets. Management strategies provide guidelines for how an asset is managed through its lifecycle, when it is renewed, why and what type of renewal. The District's current management strategies for its water utility and administration assets are generally based on past experience or manufacturer recommended renewal activities and replacement intervals. For watershed assets, management strategies are based on established levels of service and on available funding to perform maintenance activities.

5.1. Management Strategy Background

An asset's management strategy dictates when and how the asset is inspected, operated, maintained, rehabilitated, replaced, and decommissioned. The following are the core attributes of management strategies:

- Preventative Maintenance (PM) activities
- Renewal trigger (mortality, capacity, level of service, efficiency)
- Type of renewal activity (repair, rehabilitation, replacement, decommission)
- Renewal frequency (interval between rehabilitations and replacements)
- Cost of renewal activities
- Operating parameters

An asset management plan compiles management strategies to show the timing and cost of renewal activities for all the assets, and the renewal activities scheduled for each year. The compilation of multiple years' renewal activities and costs makes up the long-range financial projection.

Management strategies can be structured around asset classes to enable easier management of large numbers of assets. The District owns and manages a large number of assets and it is almost impossible to manage all the assets at the individual asset level. When applied to an entire class of assets (i.e., all sump pumps), a management strategy allows the District to consistently manage all assets in the class, and to make consistent decisions for those assets.

Management strategies can be optimized based on trends in asset performance. For example, if a concrete channel is requiring an unusual amount of maintenance, a management strategy can be adjusted accordingly. If appropriate, that management strategy can then be applied to other concrete channels. In many cases the District is lacking sufficient historical data to optimize management strategies based on performance.

Optimizing an asset's management strategy reduces risk of asset failure and minimizes lifecycle costs associated with owning the asset. Rehabilitating an asset at appropriate intervals protects it from failure and minimizes excessive corrective maintenance costs.

5.2. Assumptions

This plan makes two assumptions regarding management strategies, as discussed below.

- *This plan presents management strategies as they are known today for District assets, but does not attempt to optimize these strategies.*

Prior to this plan, the District had not formally documented management strategies for most of its assets. The District needs to validate its management strategies to confirm the existing strategies are appropriate, and to optimize management strategies, particularly for more critical and higher value assets, such as dams, pipelines, and levees. Optimizing management strategies requires collecting and analyzing historical asset performance data. The District has been working to improve its computerized maintenance management system to facilitate collection and storage of historical data. Validating and optimizing management strategies will improve the management of District assets, and also the quality of the financial projection provided in this plan. As such, one recommendation in this plan is to begin to document and optimize management strategies.

- *The management strategies presented in this plan do not address all modes of failure for all assets.*

A management strategy can be developed to account for different renewal triggers, or types of asset failures: physical mortality (age or condition), capacity (not enough capacity), level of service (no longer providing desired service levels), or efficiency (obsolete parts or high operation costs). For utility and administration assets, this plan primarily addresses physical mortality failures. For watershed assets, this plan primarily addresses capacity or level of service failures. Physical mortality generally does not apply to natural watershed assets, but does apply to constructed watershed facilities such as concrete channels. For some assets, all failure modes have been analyzed in this plan. Future plans will work towards developing a more comprehensive analysis of all failure modes for all assets.

5.3. Water Utility

This section documents management strategies for major water utility facility groups. The maintenance programs differ slightly by facility types, but follow the same core strategies. The maintenance management strategies employed by the District's water utility typically fall into three distinct categories: Preventive Maintenance, Corrective Maintenance, and Planned Work.

- **Preventive Maintenance (PM)** is minor work performed year round according to specific time based intervals such as oil changes or instrument calibration.
- **Corrective Maintenance (CM)** is work resulting from equipment failure or poor performance. It requires rehabilitation or replacement outside of an asset's originally scheduled rehabs or replacements. One goal of the District's asset management program is to reduce the amount of CM work.

- **Planned Work (PW)** is planned asset rehabilitation or replacement work that is developed by the asset management program and is published each year as part of the water utility's Annual Maintenance Work Plan (AMWP). Planned work projects are typically significant in scope, budget, or schedule. If a planned work project is large enough, it may be considered for the District's Capital Improvement Program (CIP). Many projects in the District's CIP are planned asset rehabilitation or replacement projects.

5.3.1. Dams and Reservoirs

The District owns 14 regulated reservoirs that are operated under licenses granted by the State of California Department of Water Resources, Division of Safety of Dams (DSOD). Twelve of these facilities are earthen dams with regulated reservoirs; one is an earthen dam with a covered reservoir located at a water treatment plant; and one is an in-stream retention facility to enhance groundwater recharge.

The District maintains these dam facilities to ensure safe and reliable reservoir operation and water delivery. Over 60 different maintenance activities are performed at the dams, which have been divided into the following four main categories and subcategories:

- Surface and/or Earth Work
    - Vegetation management
    - Burrowing rodent control
    - Access road and boat ramp work
    - Erosion control/bank stabilization/drainage
    - Embankment repair
    - Trash and debris removal
- Maintenance of Dam Appurtenances and Equipment
    - Inlet/outlet work
    - Valve and hydraulic systems
    - Sediment removal around intake structures/hydraulic lines
    - Concrete structure repairs and cleaning
    - Seepage systems
    - Other appurtenances (instrumentation, fences, etc.)
- Inspections, Monitoring, and Exploratory Work
    - Exploratory field investigations
    - DSOD and other inspections
- Reservoir Dewatering

A number of different maintenance activities must be performed on the dam facilities, both on a defined schedule as preventative maintenance, and on an as-needed basis as corrective maintenance. The Dam Maintenance Program outlines specific measures, protocols, policies, and reporting requirements to ensure that all routine dam maintenance activities are implemented in an efficient and environmentally sensitive manner. Table 5-1 summarizes the major preventative maintenance work activities and how often the work is performed.

Other maintenance activities, such as erosion repair, occur on an as-needed basis, based on annual visual inspections. The work is typically performed when field crews are available; usually during the winter months. Planned work includes maintenance that is performed on mechanical appurtenances, such as inlet/outlet work, is determined by condition and age of asset. Such work is scheduled in the water utility's Annual Maintenance Work Plan (AMWP) Report and is generally performed by water utility maintenance staff.

Each dam is visually inspected once a year by DSOD and District staff. Anderson Dam is also inspected annually by FERC due to its hydroelectric power operations. A formal report is generated by DSOD and submitted to the District after each inspection. The report may recommend further maintenance needs.

Table 5-1. Management Strategies for Dams and Reservoirs

Maintenance Activity	Occurrence
Valve Cycling	Annual
Annual Hydraulic System Inspection	Annual
Instrumentation Inspection	Annual
Road Work	Annual
Vegetation Removal	Bi-annual
Concrete Repair	Annual
Weephole/Expansion Joint Cleaning	Annual
Rodent Burrow Removal/Destruction	Annual
Debris Removal	Annual
DSOD Inspection	Annual

5.3.2. Off-stream Groundwater Recharge Systems

This section describes the management of the off-stream recharge systems, which consist of conveyance, recharge, and diversion facilities, as shown in Table 5-2. The off-stream recharge system includes almost 100 man-made percolation ponds. The District routinely inspects each facility as part of normal daily operations. In addition, formal condition assessments are performed each year on each facility as part of the District's on-going asset management program. In general, the District utilizes one of three management strategies for maintenance of off-stream recharge assets. Each of these strategies incorporates a mix of preventive, corrective, and planned maintenance work.

Condition based maintenance strategy – This strategy includes replacing equipment at a scheduled end of life, as planned work, and performing regular preventive maintenance work at predetermined intervals to reduce the likelihood of failure. The need for corrective work is identified through regular inspections.

Dynamic scheduling of inspections and re-evaluation of life expectancy strategy – This strategy includes optimizing maintenance intervention and asset replacement by re-evaluating life expectancy following each inspection. Inspections are scheduled initially upon reaching 2/3 of remaining life.

Ongoing minor repair strategy – In this method, no scheduled preventive maintenance is performed. Minor corrective maintenance is performed as required until eventual failure of an asset. This method is not practical for all assets, but yields low costs, meets immediate need, and costs are covered by annual contingency budgets for minor corrective work.

Table 5-2 summarizes which of these management strategies is applied to each type of off-stream groundwater recharge facility, and provides information on expected life and rehabilitation needs for each type of facility.

The maintenance activities that the District performs for these facilities during rehabilitation are described below.

- Inter-Pond Pipes – clear, repair, replace
- Conveyance Appurtenances & Valves – maintain, repair, replace
- Percolation Ponds – de-water, clean/groom, repair slope
- De-Silting Ponds – treat (polymer)
- Spreader & Diversion Dams – remove, replace
- Fish passage facility – inspect, repair
- Fish screens – repair, replace
- Fences, Signs, Roads – install, repair, maintain
- All facilities
  - Manage aquatic vegetation
  - Manage terrestrial vegetation (mowing, disking, hand weed abatement)
  - Remove trash, debris, and graffiti
  - Manage burrowing rodents

Table 5-2. Management Strategies for Groundwater Recharge Systems

Asset	Replacement Interval (Years)	Rehabilitation Interval (Years)	Management Strategy
Conveyance Facilities			
Canals and ditches	100	50	Condition Based
Supply and inter-pond pipelines	20-40	13-26	Dynamic Scheduling
Conveyance appurtenances and equipment	10-40	n/a	Condition Based, Ongoing Minor Repair
Access roads and landscape areas	20-60	n/a	Condition Based
Recharge Facilities			
Percolation ponds	100	40	Condition Based
De-silting basins	50	n/a	Condition Based
Recharge appurtenances and equipment	10-25	7-17	Condition Based, Dynamic Scheduling, Ongoing Minor Repair
Access roads and landscape areas	20-60	n/a	Condition Based
Diversion Facilities			
Diversion dams and appurtenances	20	10	Condition Based
Fish passage facilities	30	n/a	Condition Based
Diversion appurtenances and equipment	50	25	Condition Based, Dynamic Scheduling, Ongoing Minor Repair
Access roads and landscape areas	20-60	n/a	Condition Based

5.3.3. Pipelines and Tunnels

The District maintains 152 miles of pipeline and tunnel ranging in diameter from 20-inches to 120-inches. The District conducts a pipeline maintenance program that plans and executes the inspection and rehabilitation of its pipelines and tunnels. The program has been operating for approximately 11 years. By 2016, all major District pipelines will have been inspected and rehabilitated at least once. The District intends to continue pipeline inspections and rehabilitations in the future, and the frequency will be based on initial inspection findings.

A pipeline's management strategy is dependent on pipe material. The District's pipelines are primarily pre-stressed concrete cylinder pipe (PCCP) or welded steel pipe (WSP). PCCP is considered higher risk than WSP because of how it fails. PCCP fails catastrophically and can cause significant damage. Therefore, the District diligently monitors condition of its PCCP. The District's PCCP is large enough for staff to perform internal visual inspections. PCCP inspections also typically include eddy current testing to detect wire breaks. The number of wire breaks in a PCCP segment can provide some indication of the structural integrity of the pipe.

WSP is typically smaller diameter, and the District cannot easily perform an internal visual inspection. In these cases, the District performs video inspections. The District is monitoring emerging technologies that may allow for monitoring pipe condition without taking a line out of service.

Currently, pipelines must be drained for inspection, and the District performs pipeline maintenance work while pipelines are drained. The type of maintenance work performed during a pipeline rehabilitation project does not differ greatly by pipe material. The work typically includes rehabilitation and repair of smaller assets that are part of the pipelines, such as replacing corroded air release valves, repairing or replacing line valves, repairing vaults, and repairing minor leaks with internal pipe joint seals. This maintenance work helps prevent pipeline leaks, and helps keep pipelines and tunnels in service until scheduled replacements.

Pipeline inspections and maintenance work can be very costly due to complicated work conditions. The work must be done quickly, as the pipeline can only be shut down for short periods of time. The work takes place inside the pipe, which requires important safety practices, and many times, field conditions are very different from what is expected. Table 5-3 summarizes management strategies for pipelines and tunnels.

Table 5-3. Pipeline and Tunnel Management Strategies

Asset	Replacement Interval (Years)	Rehab Interval (Years)	Notes/Rehab Type
Tunnels	100	10 - 20	Internal inspection and leak repair including welding or weko-seal installation
Pre-stressed Concrete Pipe	100	10 - 20	
Welded Steel Pipe	90	10 - 20	
Small Pipeline Appurtenances (nozzles, air release valves)	10-50	n/a	Replace corroded or damaged appurtenances
Corrosion Protection Rectifiers and Test Stations	50	n/a	n/a
Large Diameter Butterfly Valves	50	35	Rebuild valve: replace seat and packing

Corrosion Protection Strategies

Corrosion protection is an effective method of protecting and extending the life of pipelines and appurtenances and reducing leaks and breaks. The Districts corrosion control program consists of the following protection strategies:

- Cathodic Protection Systems – Impressed current and sacrificial anodes
- Coatings – External protective coatings and internal protective linings
- Materials – Material selection and compatibility

These strategies essentially work together to maximize the effectiveness of corrosion protection and are the basis for the District’s corrosion control program. The District has functioning cathodic protection systems on approximately 90% of the large diameter pipelines owned and operated by the District, and is planning to expand cathodic protection to other pipelines and many other underground structures.

5.3.4. Water Treatment Plants

The District owns and operates three potable water treatment plants that together are capable of producing a total of 220 million gallons of drinking water daily. The plants and their associated capacities are listed in Table 5-4.

In addition, the District recently began operating the Silicon Valley Advanced Water Purification Center, an advanced wastewater treatment facility located at the San Jose – Santa Clara Water Pollution Control Plant. The asset register and management strategies for the assets at the Silicon Valley Advanced Water Purification Center are under development and will be included in future asset management plans.

Table 5-4. SCVWD Water Treatment Plants

Facility	Location	Year Built	Capacity (MGD)
Rinconada WTP	Los Gatos	1967	80
Penitencia WTP	San Jose (East)	1974	40
Santa Teresa WTP	San Jose (South)	1989	100

Treatment plants are made up of several interrelated systems that all must work together in order for the plant to produce potable water. Each system contains a wide variety of asset types, all of which have unique maintenance needs. To accommodate the varying needs, and ensure critical plant systems remain functional, management strategies are developed for each of the asset types. The strategies include routine preventive maintenance activities like lubrication, inspection, and calibration; as well as planned work activities such as rehabilitations and replacements. Preventive maintenance and major renewals are typically carried out on a time based schedule. Each strategy is unique and influenced by asset type, cost, risk, and expected useful life.

In addition to time based interventions, some asset types have management strategies that are influenced by efficiency or performance. Larger pumps, filter media, and ozone generating equipment are examples of asset types heavily influenced by efficiency. Routine assessment of these assets determines actual intervention points.

Operational constraints heavily influence maintenance activities and practices at the water treatment plants. Typically, major work activities are performed during the winter low flow period. Compressing large amounts of critical maintenance within a relatively small time window yields many tactical and strategic hurdles, and requires diligent planning.

Table 5-5 provides a snapshot of management strategies for several unique asset types located within the District's water treatment plants. There are over 1,100 individual assets identified at each water treatment plant and more than 150 asset types or subtypes each with a unique management strategy. The table includes the type and frequency of maintenance activities for many key asset types.

Table 5-5. Management Strategies for Water Treatment Plant Assets

ASSET TYPE	PREVENTIVE MAINTENANCE	REHABILITATION (Planned Work)	INSPECTION	REPLACEMENT (Planned Work)	WINTER MAINTENANCE?
Pumps	Year round. Frequency varies by type and may be weekly to monthly	Small pumps (<10 hp) are not rebuilt. Larger pumps generally every 10-15 years. Very large pumps maintained based on performance	Routine condition assessment every 2 years. Hydraulic performance testing of large pumps annually	Varies by type and size ranges from 10 – 50 years	Generally no, except large or critical pumps (Booster, Plant Water, Wash Water Recovery, and Back Wash)
Chemical Tanks	Year round	Generally every 10 years. Typically includes painting and any needed repairs. OCL tanks have a 5 year cycle	Generally every 5 year frequency. Includes cleaning and condition report	Varies by tank material and size. Generally 40 years	Generally yes, but some tanks containing lower use chemicals can be done year round
Water Quality Instruments	Year round. Monthly, quarterly, and annual PM job plans utilized	Not performed	Some instruments require factory calibration/inspection on a 3 year cycle	Generally 7 – 10 years. Technology changes can drive replacement frequency	No. Can be done year round
Flocculator/ Sedimentation Basins	Year round Monthly, quarterly, and annual PM job plans utilized for visual inspections and cleaning	Major rehab 40 years. May include coating, concrete patching	Annually as part of the PM program and during winter maintenance	100 years. More likely to replace due to process change	Yes. Requires draining the basin, washing down and making needed repairs
Sludge Maintenence Equipment	Year round. PM is visual inspection	10 years. Remove sediment and vegetation. Re-establish capacity	Annually or as needed as part of the PM program	100 years. More likely to replace due to process change	No. Pond taken off line for up to a year to dry out prior to sediment removal
Filter Backwash Recovery Ponds	Year round visual inspections.	Generally 10 - 15 years. Media replacement driven by hydraulic performance	Water Quality Engineers monitor performance and recommend media replacement	100 years. More likely to replace due to process change	Yes. Reducing plant capacity during the Summer months is not possible

ASSET TYPE	PREVENTIVE MAINTENANCE	REHABILITATION (Planned Work)	INSPECTION	REPLACEMENT (Planned Work)	WINTER MAINTENANCE?
Ozone Generator	Year round. Monthly, quarterly, and annual PM job plans utilized	5 – 10 years depending on performance. Clean shell and replace dielectric tubes	Water Quality Engineers monitor performance and recommend rehab. Usage and % of full capacity is driver	Replace ozone generator at 20 years, though likely longer due to low dose typically used	Yes. Redundancy is needed during the high flow period
Valves/Valve Actuators	Year round. Quarterly and semi-annual PM job plans	Not performed	No formal inspections performed as part of the PM program	Generally 20 years. Modulating actuators are replaced more frequently	Generally no
Compressors	Year round. Quarterly, semi-annual, and annual PM job plans	10 – 15 years	Inspections performed as part of the PM program	15 – 45 years depending on type and size	Generally no
RTU Cabinets	Year round. Quarterly and annual PM job plans	Not performed	Inspections performed as part of the PM program	10 years. Technology changes are driver	Generally no

5.3.5. Pump Stations

The District operates three large raw water pump stations, described in Table 5-6. Similar to its water treatment plants, the District's pump stations contain a wide variety of asset types, all of which have unique maintenance needs and management strategies. The strategies include routine preventive maintenance as well as major rehabilitation, inspection, and replacement activities. Preventive maintenance and major renewals are typically carried out on a time based schedule.

Table 5-6. SCVWD Pump Stations

Facility	Location	Number of Pumps	Capacity (MGD)
Pacheco	Near Hwy 152 & I-5	12	360
Coyote	Morgan Hill	6	184
Vasona	Los Gatos	4	86

In addition to time based interventions, the District's large pumps are managed based on efficiency or performance. Routine assessments of the pumps determine actual intervention points. The District has developed performance-based management strategies for pumps using knowledge of the impact of age and run-time on efficiency and wear. Unfortunately, the District has not consistently documented the historical data, the strategies, or reasoning behind the strategies. The District is in the process of compiling a history of the pumps and developing a program to better manage all of its large pump stations.

The District performs routine preventive maintenance activities on the pump station assets. Preventive maintenance activities include minor work such as changing oil, cleaning parts, or replacing small components of assets. The preventive maintenance work helps keep the pump stations in service until scheduled rehabilitations or replacements. Management strategies for some typical pump station assets are provided in Table 5-7.

Table 5-7. Management Strategies for Pump Station Assets

Asset	Replacement Interval (Years)	Rehab Interval (Years)	Rehab Description
Main Pump System			
Pumps	50	15	Rebuild pump
Motors	50	30	Refurbish windings and bearings
Flow Meters	25	n/a	
Control Panels	10-35	n/a-25	Refurbish
Adjustable Speed Drives	30	15	Refurbish
Main Electrical System			
Standby Generator	35	25	Refurbish
Switchgears	35	n/a	
Pump Unit Breakers	35	n/a	
Transformers	40	n/a	
Switches	35	n/a	
HVAC System			
Chillers	20	10	Refurbish
Air Handling Units	30	15	Refurbish
Air Separator	50	25	Refurbish
SCADA System			
RTUs	10	n/a	
Fiber Optic Cable	25	n/a	

5.4. Watersheds

The District's watershed programs provide services that support all three District Board Ends Policies shown in Section 3.3: Clean and Reliable Water Supply (E-2), Healthy and Safe Environment (E-3), and Water Resources Stewardship (E-4). The District develops management strategies for creeks to meet the multiple service levels defined for the watershed business area. Key maintenance activities to provide these services are provided through the District's multi-year Stream Maintenance Program (SMP). Under this program a number of routine maintenance activities occur within and along channels on an annual basis. The District's permit for the SMP requires that the District document its asset management strategies for the creeks. The District develops 'maintenance guidelines' for each creek based on hydraulic models and as-built drawings to comply with these requirements. The District is in the process of updating these maintenance guidelines.

The routine maintenance activities that occur as part of the SMP include sediment removal, bank protection, vegetation removal, and minor maintenance work. The District removes sediment and vegetation from channels to improve flood flow conveyance and restore design capacity. Erosion repair occurs along natural channels where banks have scoured and eroded, possibly endangering homes, trails, fences, property, and trees due to bank failure. Minor maintenance work includes trash and graffiti removal, levee maintenance, and fence repair, among others. The work to remove sediment or repair erosion must occur in the summer months while stream flows are low or non-existent, when fish are not migrating or spawning. Most minor work occurring above the ordinary high water flow can occur year round as it does not impact the stream flow or water quality.

A channel's management strategy is partially dependent on the type of channel. Some channels are modified (concrete-lined), while others are unmodified (natural). Unmodified, or natural channels, are not replaced, and typically do not require major rehabilitation work. Modified or concrete-lined channels will require rehabilitation work, and perhaps eventual replacement.

Both types of channel can undergo capital improvement projects to provide added flood protection, according to identified levels of service. In addition, some channels contain other constructed assets such as weirs, stream gages, or fish passage facilities, which may also require rehabilitation and replacement. Table 5-8 summarizes the replacement and rehabilitation intervals, and maintenance schedule for modified and unmodified channels.

Table 5-8. Summary of Replacement Intervals and Maintenance Schedule: Watersheds

Facility Type	Replacement Interval (Yrs)	Rehabilitation Interval (Yrs)	Maintenance Interval (Yrs)	Inspection Interval (Yrs)
Unmodified Channels	N/A	N/A	3-5	1-2
Modified Channels	100	25-50	3-5	1
Fish Passage Facilities	30	N/A	1	1

Finally, the District manages its watershed assets to protect and restore habitat, and encourage the return of endangered species such as the red-legged frog, steelhead trout, and the salt marsh harvest mouse. The District is in the process of developing a comprehensive program to manage its ecological assets.

5.4.1. Unmodified Channels

To preserve their flood protecting characteristics, the water district works to maintain streams without jeopardizing the long-term health of stream ecosystems. Policies and practices are in place to assure that routine maintenance activities protect water quality, fish and wildlife, and other aquatic species.

Current management strategies do not fully address the problem of incision. Urbanization of the Santa Clara County over the past 50 years or more has had a significant effect on local streams, causing incision of channels and loss of vital floodplains. Incised channels are unstable and extremely difficult to manage and rehabilitate. These channels are deep and wide, and lack a defined bank-full channel and floodplain. The banks are steep and subject to continued failure, while fish habitat is usually sparse. The lack of riparian vegetation causes warmer water temperatures, which leads to unfavorable salmonid rearing conditions. Causes of channel incision include reduced sediment load due to upstream dams, and increased peak flows caused by development and impervious surfaces of the watershed. Because of these degrading channel conditions, the District needs to develop management strategies to manage and arrest further incision, and to improve overall watershed habitat.

Typical maintenance work for the unmodified channels includes bank repair, sediment removal, and vegetation removal activities. These activities are typically done as part of the SMP, and occur during the summer work season (June 15 – October 31). Watershed staff performs annual creek inspections to identify areas needing maintenance. After a list of maintenance work is generated, watershed staff prioritizes the needs for the upcoming summer work season based on a variety of factors, such as public safety, watershed budget, resource availability, environmental conditions, and site access. The District submits work lists to regulatory agencies for approval, and once approved, work occurs between June 15 and October 30 each year. The District follows Best Management Practices and implements mitigation requirements during and after the work is performed to protect water quality, habitat, and fish and wildlife. Table 5-9 provides a summary of SMP work types and when they occur.

Table 5-9. SMP Work Schedule

Type of SMP Work	Type of Channel*	Time of Year Work Occurs
Sediment Removal	Modified, Modified w/Ecol Value	Summer, Fall (June - Nov)
Bank Repair	Unmodified, Modified w/Ecol Value	Summer (June – Mid Oct)
Minor Work	Unmodified, Modified, Mod w/Ecol Value	All Year
Vegetation Removal	Unmodified, Modified, Mod w/Ecol Value	All Year
Fish Passage Facilities	Modified, Modified w/Ecol Value	Summer (June – Oct)

*See section 5.4.2 for description of Modified Channel with Ecological Value

5.4.2. Modified Channels

The District owns and maintains over 40 miles of modified, or concrete-lined, channels. These channels are maintained based on maintenance guidelines, which are currently being developed or updated for most creeks. Some of these creeks are identified as "Modified with Ecological Value"; meaning that the creek has been modified from its historical conditions, but still has features that support stream ecology. Watershed staff visually inspect major channels each year and document areas in need of repair. Watershed engineers review these sites to determine if the sites can be repaired under the existing Stream Maintenance Program permit or if the repair must be performed as a capital project.

Routine maintenance on modified channels includes the SMP work identified in Table 5-9. For modified channels sediment is typically removed from the lower portions of channels (closer to the bay). Minor repairs to concrete include patching, and in some cases, small panel and reinforced steel replacement. If the site warrants a capital project, it may take up to five or more years to complete the repair after planning, permitting, design, and construction.

5.4.3. Fish Passage Facilities

There are approximately 30 fish passage facilities the District owns and maintains within the county. Under the current (2014) SMP permits, fish passage facilities must be inspected annually during the period between March 1 and April 30 to determine the condition and required maintenance. Inspections must determine if sediment, debris, or algal growth are impairing the functionality of the facility. A follow up inspection of each of the facilities needing maintenance must be performed between September 1 and October 31 to ensure the completion of maintenance and repairs were performed.

Typical maintenance on fish passage facility involves sediment and debris removal to allow for unhindered fish passage during the migration season. Maintenance occurs during the SMP work season (June 15 to October 31) when flow in creeks is at a minimum. At times, fish relocations are necessary when the works calls for dewatering the site to perform the necessary work. When channels are dry during the summer, this is not a concern. Typical average cost for this type of maintenance on fish passage facility is approximately $20,000 annually for labor and equipment depending on the facility, but could be more. Table 5-10 lists the District fish passage facilities that are included in the 2014 SMP permit requirements.

Table 5-10. Fish Passage Facilities

Fish Passage Facility Type	Waterway
Fish Ladders:	
Coyote Percolation Ponds	Coyote Creek
Mabury Diversion	Upper Penitencia Creek
Noble Avenue Diversion	Upper Penitencia Creek
Masson Diversion	Guadalupe Creek
Alamitos Diversion	Guadalupe River
Moffett Boulevard	Stevens Creek
Evelyn Avenue	Stevens Creek
Central Avenue	Stevens Creek
Fremont Avenue	Stevens Creek
14 Drop Structures	Llagas Creek
Fish Screens:	
Coyote Canal Diversion	Coyote Creek
Mabury Diversion	Upper Penitencia Creek
Noble Avenue Diversion	Upper Penitencia Creek
Masson Diversion	Guadalupe Creek
Alamitos Diversion	Guadalupe River
Church Avenue Diversion	Llagas Creek

5.4.4. Ecological Assets

The District is working to develop management strategies for additional ecological assets through its Ecological Monitoring and Assessment Program (EMAP). The program is being designed to improve the efficiency and effectiveness of the District’s ecological monitoring activities to ensure that accurate information is available to inform and improve watershed management decisions. The EMAP project will develop strategies for collecting, storing, analyzing and reporting ecological data.

This project will create a comprehensive database that tracks stream ecosystem conditions to help the district and other county agencies and organizations make informed watershed and asset management decisions. This program will continue to be developed over the next four years. Management strategies for ecological assets will be developed as part of this program.

5.5. Administration

This section documents management strategies for three administration program areas that manage physical assets: Facilities, Information Technology and Systems, and Fleet. These three program areas each follow different maintenance programs, but generally follow the guidelines of the District's asset management framework. In future years, the District will work to streamline the asset management programs for administration assets.

5.5.1. Buildings and Grounds

The District's Facilities Management Unit manages eleven buildings at its Almaden and Winfield campuses, and shares maintenance responsibility for the District's treatment plants, pumping stations, and real estate facilities. The management strategies employed by the unit typically fall into the same three distinct categories as used by the water utility: Preventive Maintenance, Corrective Maintenance, and Planned Work. These are defined in Section 5.3.

The District manages its buildings and grounds to efficiently minimize energy consumption, prevent failures of building systems that would interrupt delivery of public services, sustain a safe environment by keeping buildings in good repair, and provide cost efficient maintenance. Maintenance of buildings and grounds is primarily conducted by District staff and supplemented by outside contractors.

On average, approximately 75 percent of maintenance work is for building services, office moves and new hire setups, while 25 percent is for HVAC services. HVAC services include heating, venting, air conditioning and plumbing work at the Districts water treatments plants, pumping stations, and other facilities.

Maintenance activities are scheduled at required intervals, with approximately 500 to 600 PM or CM work orders performed monthly. Table 5-11 provides a summary of management strategies for buildings and grounds, including typical activities and their frequencies. Some buildings and grounds improvement work, such as major building renovation projects, are done as capital improvement projects.

Several building systems require annual or multiyear permitting inspections. These systems include elevator, fire suppression, and cafeteria equipment. These permits are maintained on the CMMS system as PMs and are kept on file in the Facilities office.

Table 5-11. Management Strategies for Buildings and Grounds

Inspection and Maintenance Schedule
Monthly Inspections:
Below Ground Storage Tanks
Generator Inspection
Emergency Lights/Exit Sign tests
HVAC ventilation systems inspection
Fire Alarm Systems Testing
Quarterly/Bi-Annual Inspections:
Gutters, Downspouts, Storm Drains Cleaning
Lighting replacements
Roll-Up Doors
Solar Panels/Parking structure
Annual Inspections:
Boilers
Cooling Towers
Elevators
Fire Hydrants
Fire Suppression
Fire-Life Safety
Fire Sprinkler Systems
Furnace
Hot Water Heaters
HVAC/Change Filters
Irrigation Systems
Roofs/Inspections
As-Necessary Maintenance:
Asbestos Management
Electrical Work
Building Remodels
Building Repairs and Maintenance
HVAC Repairs
Outside Air Tanks
Plumbing Repairs
Roof Repairs
Water Efficiency

5.5.2. Fleet and Equipment

The District's fleet and equipment assets are managed by the Equipment Management Unit, which provides planning, management, administrative oversight, maintenance and repairs for District fleet and welding services. There are approximately 300 vehicles and 550 pieces of equipment managed by the District, described as Class I - IV. The following is a description of each class type:

- **Class I:** Sedans, Rangers, SUVs, Vans, Trucks (F-150 through F-350)
- **Class II:** Trucks F-450 (14,000 GVW) and larger, Crane Trucks, Trailers, Compactors, Water Trucks, Flatbed Trucks, Spray Rigs, Utility Body Trucks
- **Class III:** Heavy Equipment (large generators, air compressors, off-road construction equipment)
- **Class IV:** boats, motors, generators, electric/gas utility carts, walk behind skidsteer, sandbag machines, portable restrooms, trailers, small tools, saws, pumps, and blowers

The management strategies for vehicles and equipment include preventive maintenance activities and replacement at prescribed schedules.

The District established monthly preventative maintenance schedules for all Class I-III vehicles. Preventive maintenance activities are tracked in the District's Maximo system and are conducted based upon the established schedules. The District periodically reviews and updates preventative maintenance schedules, and runs quarterly utilization reports for various classes of vehicles.

Preventative maintenance inspections are performed in accordance with industry standards and are presented in Table 5-12.

Table 5-12. Class I – III Preventive Maintenance Schedule

Vehicle Class	Preventative Maintenance Schedule
Class I	Every 5,000 miles or 1 year
Class II - Commercial	Every 3 months
Class II – Crew Trucks	Every 5,000 miles or 1 year
Class III	Every 6 months

Preventative maintenance includes a variety of tasks, depending on vehicle type. Typical preventative maintenance includes, but is not limited to such tasks as changing engine oil and filter, smog testing, tire rotation, and brake inspection.

The EMU has also adopted replacement schedules for its fleet and equipment assets as presented in Table 5-13.

Table 5-13. Management Strategies for Fleet and Equipment

Vehicle/Equipment Class	Replacement Interval
Class I – III Vehicles	Every 125,000 miles or 12 years
Class IV Equipment	Every 12 years
Submersible Pumps	Every 6 years

5.5.3. Information Systems

The District's Information Management Services Division has been proactively managing its hardware and software assets by keeping inventories of all assets, maintaining maintenance service agreements with hardware and software vendors, and replacing hardware and software assets on an as-needed basis. Table 5-14 summarizes the ideal replacement intervals for information technology (hardware), systems (software), and radio assets.

Although performing replacements at these recommended intervals would optimize efficiency of IT and IS assets, the District rarely has funding to manage the assets to this standard. The District also pays annual fees to hardware and software providers for maintenance of hardware, software, and radios.

Table 5-14. Management Strategies for IT, IS, and Radios

Asset	Replacement Interval (Years)
Radios	5
Routers	5
Servers	5
Software	5
Switches	5
Wireless Access	5

5.6. Asset Decommissioning

In some cases, the best management strategy for an asset is decommissioning, or taking it out of service. For example, a decrease in population in a particular area may lead to lower level of service requirements, and could lead to eventual decommissioning of assets serving the area. Or, an asset may take on too much risk over time because it is located near a hazard. The District has not typically looked at decommissioning assets in the past, but does have some examples assets for which decommissioning might be the best management strategy. These assets are described below.

- **Out of Service Canals:** The District owns three canals that are out of service: the Coyote-Alamitos, Coyote Extension, and Evergreen canals. These canals were previously used to divert water to facilities for recharge, but have been out of service for many years, and the District has no current plans to rehabilitate or use the facilities. The facilities cost the District approximately $70,000 per year to maintain, even though they are not in use. Maintenance includes trash and graffiti removal, vegetation management, and site safety repairs.
- **Anderson Hydroelectric Facility:** The Anderson Hydroelectric Facility produces a small amount of hydropower at the base of Anderson Dam. The facility is important to the District as it provides clean energy, and supports its environmental stewardship goals. The facility maintenance costs currently exceed the value of the electricity it produces. However, In the future, the electricity could become more valuable, especially when considered in the context of global warming.
- **Penitencia Water Treatment Plant:** Although the Penitencia plant is important for providing treated water supply on the East side of Santa Clara County, the plant sits on an active landslide. During an earthquake, the plant is particularly vulnerable to damage and failure due to a high likelihood of liquefaction. Historically, the District has invested in water treatment plant upgrades at this plant every ten to fifteen years. The upgrade projects can be very costly, in the $50 to $100 Million range. The District may be able to invest this money in the future into a more reliable site rather than continuing to invest in a high risk site.

The District’s validation process for new capital projects requires evaluation of asset decommissioning as a project alternative. One recommendation of this plan is to educate staff further on the concept of asset decommissioning as a valid project alternative to be seriously evaluated during project validation. Another recommendation is to further study the assets listed above for potential decommissioning now or at end of life.

5.7. Climate Change

Climate change impacts are expected to gradually increase over time, but are difficult to measure and plan for in the near term. While some effects of climate change are noticeable today, the incremental change expected over the next 20 to 30 years is not large. When looking out 100 years in the future, climate change causes much more noticeable impacts. This is particularly true for sea level rise.

The Asset Management Plan is the District’s only plan with a 100-year planning horizon. Other plans, such as the Water Supply and Infrastructure Master Plan and the Safe, Clean Water Program, look 20 to 30 years in the future. The management strategies for the District’s assets described in this plan do not explicitly address climate change. One recommendation of this plan is to start planning for climate change in the Asset Management program since it projects 100 years into the future, a horizon sufficient to capture the effects of climate change. Two concepts that the program can begin to plan for include:

- **Sea Level Rise:** The District will need to plan for relocating or modifying assets that are in the areas of the county expected to be impacted by rising sea levels.
- **Increased Heat or Temperature Extremes:** Most District assets were designed for a cooler climate characteristic of the Bay Area. Equipment and materials were not designed to withstand high temperatures for extended periods. Over time, temperatures in this area are expected to increase. As assets are replaced in the future, the District will need to use materials and equipment capable of withstanding higher temperatures for longer time periods. In addition, with higher temperatures, the District will likely experience increased demand for water, which will affect most of the asset service levels.

6. Financial Projection

This chapter presents the long-range financial projection for the Santa Clara Valley Water District assets. The information in this chapter builds upon the data and assumptions developed in the previous chapters. These financial projections show the estimated future investment needs for all District assets. The 100-year projection shows an average annual cost of $466 Million, which is slightly less than the District's current total budget of $469 Million (FY 15 Budget). The average capital expenditure over the next 100 years is $161.5 Million per year. This is significantly less than the District's current capital budget of $232.8 Million, which shows that the District is currently undergoing a period of major asset renewals including Dam and Water Treatment Plant retrofits.

Although the forecast in this plan shows that the District's current budgeted level of $469 Million is sufficient to sustain existing infrastructure in the future, it is too premature to state whether this is true. The District will continue to evaluate its financial sustainability in future plans, and take appropriate actions when needed. This is the District's first iteration of an asset management plan. It is based on several assumptions, and will be refined and improved over time to present a more accurate picture of future financial needs. Understanding the future investment needs will enable the District to make sustainable and proactive management decisions.

6.1. Methodology

The long-range financial projection was created using the data from the asset inventory and valuation in Chapter 2, the management strategies in Chapter 5, and the District's current budget. The quality of this projection is dependent on the quality of the data used in Chapters 2 and 5. The District's asset inventory, valuation, and management strategies are recorded with a relatively high level of confidence, but still need to be improved in the long term. Chapter 7 provides more detail on the level of confidence in the data.

A 100-year projection was generated for the District's water utility, watershed, and administration assets because it captures the full lifecycle of all District assets. For proper asset management planning, a long-range planning horizon should be equal to the life of the longest sustainable asset. Among the District's assets are large civil structures such as dams, pipelines, tunnels, buildings, and levees that have long lives. A short-range planning horizon can fail to capture large capital requirements that may lie just beyond the analysis window. Without a long-range plan, the District may not be able to financially prepare for renewal requirements. At the same time, the farther out the projections extend, the less precise they become. As such, confidence in projections beyond 100 years is low.

The District's 100-year renewal projections were developed using a MS Excel based modeling tool. The model schedules all the District's asset rehabilitations and replacements by year over the 100-year planning horizon. The result is a financial graph showing investments needed to fund asset renewals for 100 years. The projection uses seven cost categories, described in Table 6-1.

Table 6-1. 100-Year Financial Forecast Cost Category Data Sources and Descriptions

Category	Data Source	Description
Admin Cost	Current District Budget	Budgeted District projects that are not directly related to asset operations, maintenance, planning, or engineering (non-asset spending). See Appendix Five for a list of projects included in this category.
Planning & Engineering Cost	Current District budget	Budgeted District projects that are related to planning and engineering. See Appendix Five for a list of projects included in this category.
Existing O&M	Current District budget	Budgeted District projects that are directly related to asset operations or maintenance. These projects already include projected spending for maintenance renewals. To avoid 'double counting', the maintenance renewal amount is subtracted from the total budgeted amount. See Appendix Five for a list of projects included as Existing O&M projects.
Future Asset O&M	Current District five year CIP	Projected future O&M costs for current planned capital projects.
Maintenance Renewal	Excel model of management strategies developed for this plan	Infrastructure rehabilitation and replacement projects that have total installation cost less than $50,000.
Capital Renewal	Excel model of management strategies developed for this plan	Infrastructure rehabilitation and replacement projects that have a total installation cost greater than or equal to $50,000.
Planned CIP	Current District five year CIP	Current planned capital expenditures.

6.2. Assumptions

This section summarizes several assumptions that were made throughout the plan that influence the 100-year projection. In addition, this section provides information on some general financial assumptions used in the projection.

Current Budgets: This plan uses current budgets to project future asset operations and maintenance, and planning and engineering costs. One major goal of the District's asset management program is to begin to rely on the asset management strategies and future asset replacement and rehabilitation needs identified in this plan to develop the budgets for asset operations, maintenance, planning and engineering. The ability to refine these budget categories based on actual asset management strategies will greatly improve the accuracy of the financial projection; however, it will take many years for the program to get to this point.

Asset Value: The financial projection uses asset replacement values presented in Chapter 2. Chapter 2 values were developed using the assumptions in Appendix Two. These assumptions affect the quality of the financial projection. Though the asset replacement values are estimated based upon the best available data, the projection still provides meaningful conclusions and can be refined further as more accurate data becomes available.

Management Strategies: The Excel model schedules rehabilitations and replacements over the planning horizon starting from the date the asset was last rehabilitated or replaced. In most cases, the District does not have actual past rehabilitation and replacement dates. So, the model assumes the assets were rehabilitated or replaced at the appropriate intervals based upon available information. The accuracy of the date of the last rehabilitation or replacement affects the accuracy of the financial projection.

The accuracy of the replacement and rehabilitation intervals identified in the management strategies presented in Chapter 5 also affect the financial projections. These management strategies provide an estimated replacement interval and an estimated rehabilitation interval for each asset, but the District will continue to further validate this information.

Capital vs. Maintenance Renewals: Because the District defines a capital investment as being greater than $50,000, the model considers any infrastructure renewal project costing more than $50,000 as a capital project. In reality much of this work would be characterized as maintenance work and performed through District operating budgets. So, for this plan, much of the work included in the Capital Renewal category is actually maintenance work that falls over the $50,000 threshold used to develop the financial projection. In future plans, these categories will be refined.

General Assumptions: The projection does not include inflation. Values can become artificially inflated over a long time period, such as 100 years. Also, adding inflation dilutes the peaks over the horizon. For the same reason, the future values are not discounted to present value.

6.3. Financial Projections

The District's projected 100-year renewal requirements are presented in Figure 6-1 and Table 6-2. As shown in Table 6-2, the annual average investment needed for the first ten years is projected at $475 Million. This is slightly higher than the District's current budget of $469 Million, and is consistent with the District's current surge in capital expenditures occurring in the next ten years, including dam seismic retrofits, improvements to Rinconada Water Treatment Plant, and Safe, Clean Water projects.

Although the forecast in this plan shows that the District's current budgeted level of $469 Million is sufficient to sustain existing infrastructure over the 100 year horizon, it is too premature to state whether this is true. This is the District's first iteration of an asset management plan. It is based on several assumptions, and will be refined and improved over time to present a more accurate picture of future financial needs. Additionally, each individual business area (Water Utility, Watershed, and

Administration) is funded differently, and one area may have more than enough while another may not have enough funding to sustain its services.

For the first ten years of the projection, the average capital renewal cost is $47 Million. Note that this amount is not included in the current planned CIP, and so it may appear that the District is failing to invest about $47 Million in its capital improvement program. This is not actually true, and is a result of the logic used in the financial model. The model considers any project costing more than $50,000 as a capital project. In reality much of this work would actually be characterized as maintenance work and performed through District operating budgets. So, most of the work included in the $47 Million is actually maintenance work that falls over the $50,000 threshold used to develop the financial projection. Since this amount is not included in capital or current operating budgets, there is a chance that the District is developing a "backlog" of maintenance work. It is not clear at this time whether this is true, and will be more evident in future plans.

Also note that in this projection, for capital renewals, the capital cost for each major investment is included in the year that the replacement is expected to begin. Although the costs are shown in a single year for this forecast, spreading the cost over a number of years may provide a more realistic picture of actual future expenditures. The planned CIP costs are spread over many years, as laid out in the District's current 5 year CIP.

The average capital expenditure over the next 100 years is $161.5 Million per year. This is significantly less than the District's current capital budget of $232.8 Million, which shows that the District is currently undergoing a period of major asset renewals. The largest peak expenditures in an individual year during the 100 year period are associated with water utility civil asset renewals. The largest peak expenditures are projected to occur in the years 2064, 2086, and 2089, mainly due to the following associated costs:

- 2064: Pacheco Tunnel renewal ($538M)
- 2086: Coyote, Stevens Creek, and Calero Auxiliary Dams renewals ($150M per dam)
- 2089: Santa Clara Conduit[6] replacement cost ($580M); Almaden Dam renewal cost ($150M)

The 100-year financial projection highlights the importance of developing sound management strategies for the large civil assets. Civil asset renewals are the largest expenditures over the 100-year period, and greatly influence the financial projection. The scope of many of these capital projects, such as major renewals of the tunnels and pipelines, may change over time depending on changing materials and technology. With continued advancements in new materials and technology, the large civil infrastructure may not ever need to be replaced.

The existing asset O&M cost is much greater than the planned maintenance renewal cost, and is a straight line projection following year 2030. Again, a major long term goal of the Asset Management Program is to develop more accurate long range budget projections for asset operations and maintenance that are more representative of actual planned maintenance renewals and of asset

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[6] The September 2013 *San Felipe Division Reach 1 Asset Management Plan* found that adding a cathodic protection system to the Pacheco Conduit, which was constructed around the same time as the Santa Clara Conduit, would optimize the life of that pipeline and delay replacement of the conduit to well outside of the planning horizon. A similar conclusion may be reasonable for the Santa Clara Conduit.

management strategies. The program also hopes to develop more accurate future planning and engineering costs based on management strategies.

The financial projections provide information on significant investments needed in the future. It is important to ensure that sufficient funding is available for these major asset investments. Different financing strategies, such as bonds or savings, are appropriate for different types of investments, and for different time intervals. The District's financial planning program works to ensure the District has sufficient funds to sustain services throughout the future. Program staff monitors upcoming capital expenditures and works to develop appropriate financing strategies to ensure funding is available when needed. The financial projections in this plan can be used by financial planning program staff to help with long range financial planning.

The next three sections describe the financial projections and annual expenditures for the District's three business divisions.

Figure 6-1. District-wide Long-Range Investment Needs Projection

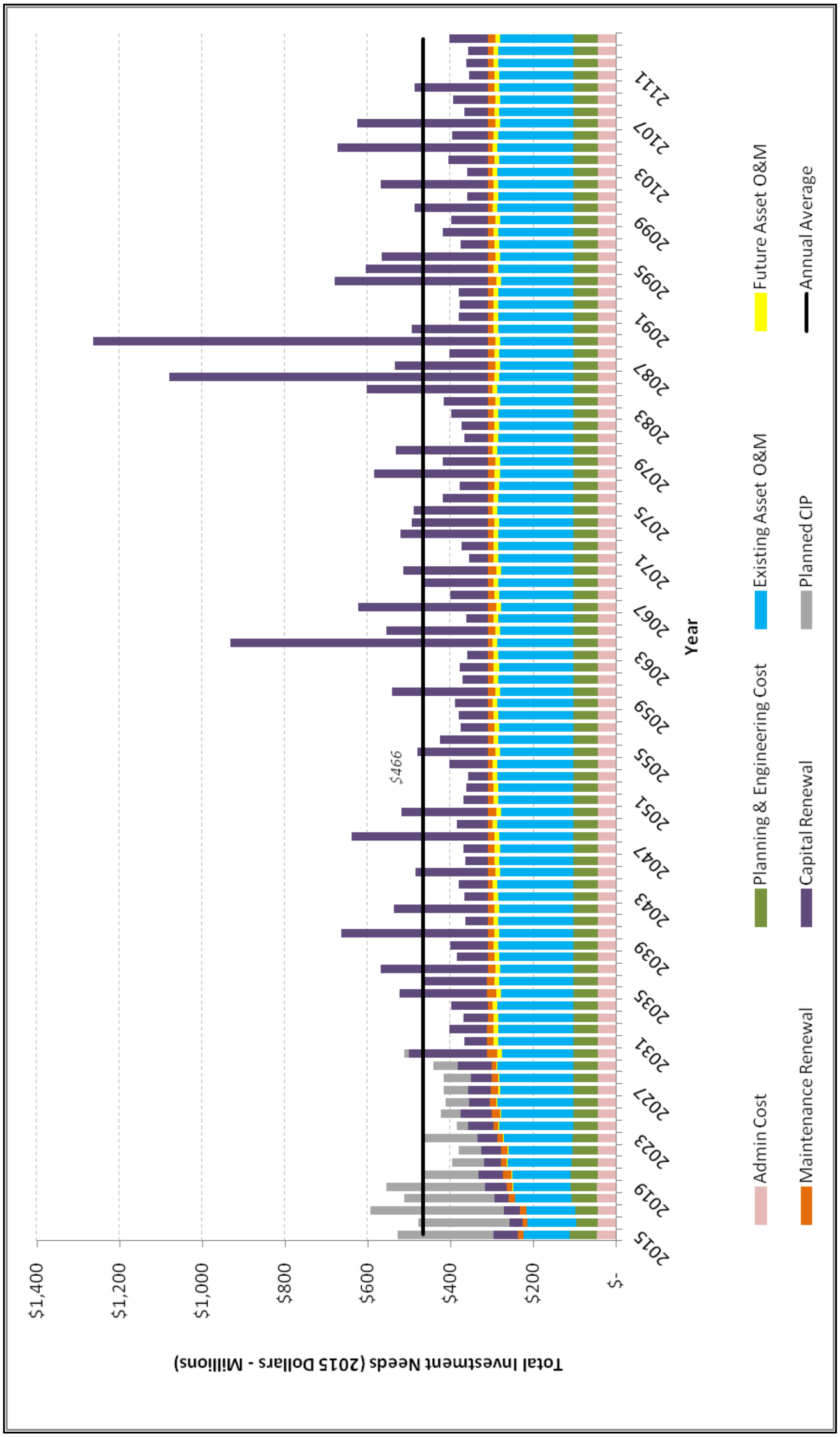


Table 6-2. District-wide Average Annual Expenditures

Planning Horizon	**Annual Average**								
	Admin	Planning & Engineering	Existing Asset O&M	Future O&M	Maintenance Renewal	Capital Renewal	Planned CIP	Total CIP	**Total**
10-year	$44,374,205	$60,473,014	$141,766,922	$1,409,000	$14,906,504	$47,096,505	$164,952,800	$212,049,305	$474,978,950
25-year	$44,208,909	$58,907,055	$164,863,863	$5,668,760	$16,111,941	$81,950,814	$78,006,540	$159,957,354	$449,717,882
50-year	$44,159,037	$58,211,460	$173,423,978	$8,590,680	$15,339,049	$109,822,162	$39,003,270	$148,825,432	$448,549,635
100-year	$44,134,100	$57,863,662	$177,267,975	$10,051,640	$15,360,002	$142,014,495	$19,501,635	$161,516,130	$466,193,509

6.3.1. Water Utility

The Water Utility 100-year projected renewal requirements are presented in Figure 6-2 and Table 6-3. The 100-year average annual expenditure for Water Utility renewals is $324 Million, which is 69.5 percent of the total District's 100-year average annual expenditure of $466 Million. This is consistent with findings in the asset valuation section of Chapter 2. The Water Utility assets are valued at $7 Billion, which is about 65 percent of the total District asset value of $10.91 Billion. Table 6-3 shows that the first ten-year annual average investment needed for water utility is approximately $276 Million, which is lower than the 100-year average of $324 Million, as shown on Figure 6-2. This is consistent with the finding that the largest renewal projects occur in the latter half of the 100-year planning horizon.

The table and figure also show that the existing asset operations and maintenance costs make up 40 – 50 percent of the average annual cost for the water utility. Much of this expense is related to water treatment plant operations. Chemical costs, power, and staff labor to keep the treatment plants running make up a significant amount of the total water utility financial projection.

Figure 6-2. Water Utility Long-Range Investment Needs Projection

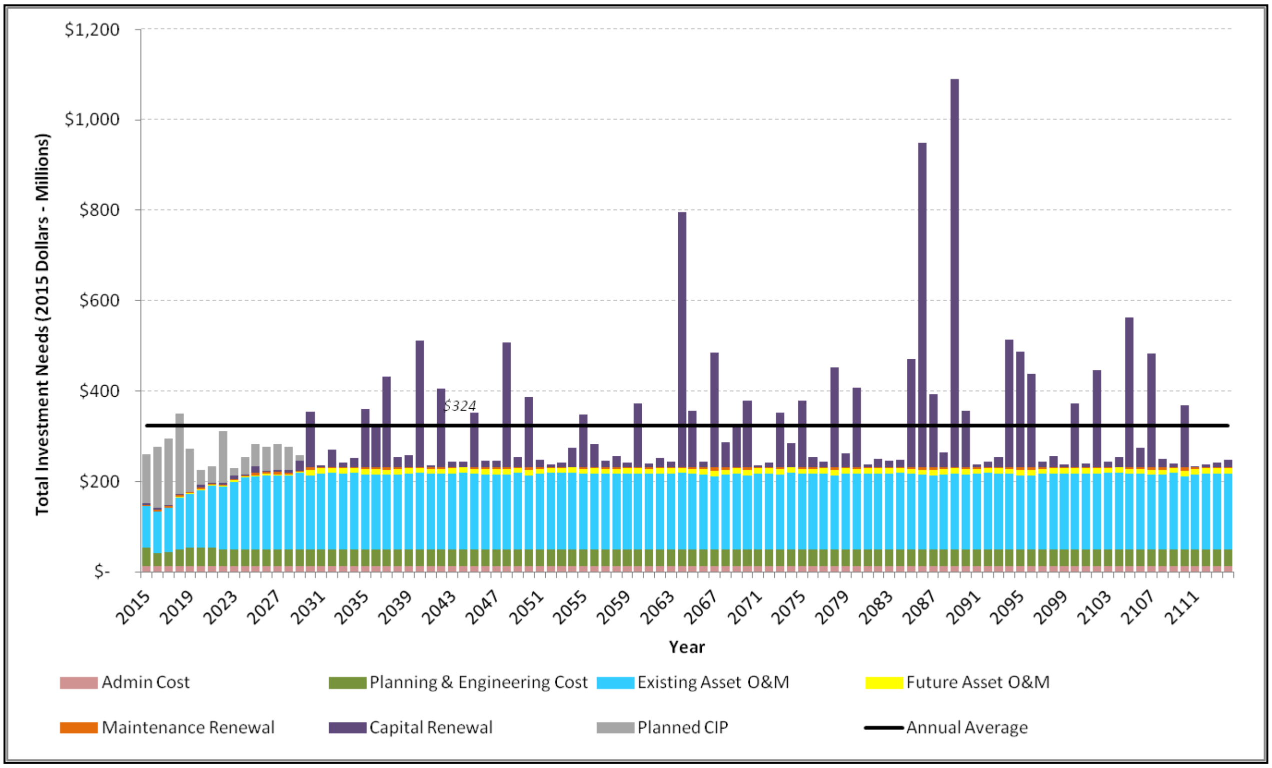


Table 6-3. Water Utility Average Annual Expenditures

Planning Horizon	**Annual Average**							
	Admin Cost	Planning & Eng. Cost	Existing Asset O&M	Future Asset O&M	Maint. Renewal	Capital Renewal	Planned CIP	**Total**
10-year	$12,925,000	$36,724,800	$123,060,588	$1,405,000	$3,084,712	$2,990,947	$90,530,290	$276,364,847
25-year	$12,908,800	$36,449,680	$149,062,407	$5,661,160	$3,833,193	$29,632,605	$46,946,937	$286,449,105
50-year	$12,903,400	$36,313,340	$158,587,904	$8,581,880	$3,648,896	$56,992,782	$22,994,418	$301,478,832
100-year	$12,900,700	$36,245,170	$162,952,363	$10,042,240	$3,955,037	$85,421,492	$11,381,076	$323,742,317

6.3.2. Watersheds

The Watershed projected 100-year renewal requirements are presented in Figure 6-3 and Table 6-4. The 100-year average annual expenditure for Watershed renewals is $112 Million, which is 24 percent of the total District's 100-year average annual expenditure of $466 Million. The asset valuation section of Chapter 2 values the watershed assets at $3.5 Billion, which is 32 percent of the total District asset value of $10.91 Billion. A significant portion of the total watershed asset value is land value. This plan assumes land will not be replaced, and so it is not captured in the financial projection.

As shown in Figure 6-3, there are significant annual expenditures associated with the Clean, Safe Creeks and Safe, Clean Water Programs over the coming five years. The next significant peaks in expenditures are in the years 2065 and 2074. In 2065 the costs are associated with replacement of concrete channels in Matadero Creek, Permanente Creek, Junipero Serra Channel, San Tomas Aquino Creek, Canoas Creek and Guadalupe River. In 2074, the costs are associated with maintenance of various natural channels.

Table 6-4 shows that the ten-year annual average investment needed for watershed renewals is $162 Million, which is much greater than the 100-year average of $110 Million. The increased spending in the first 10-years is due to planned Safe, Clean Water Program expenditures.

Figure 6-3. Watersheds Long-Range Investment Needs Projection

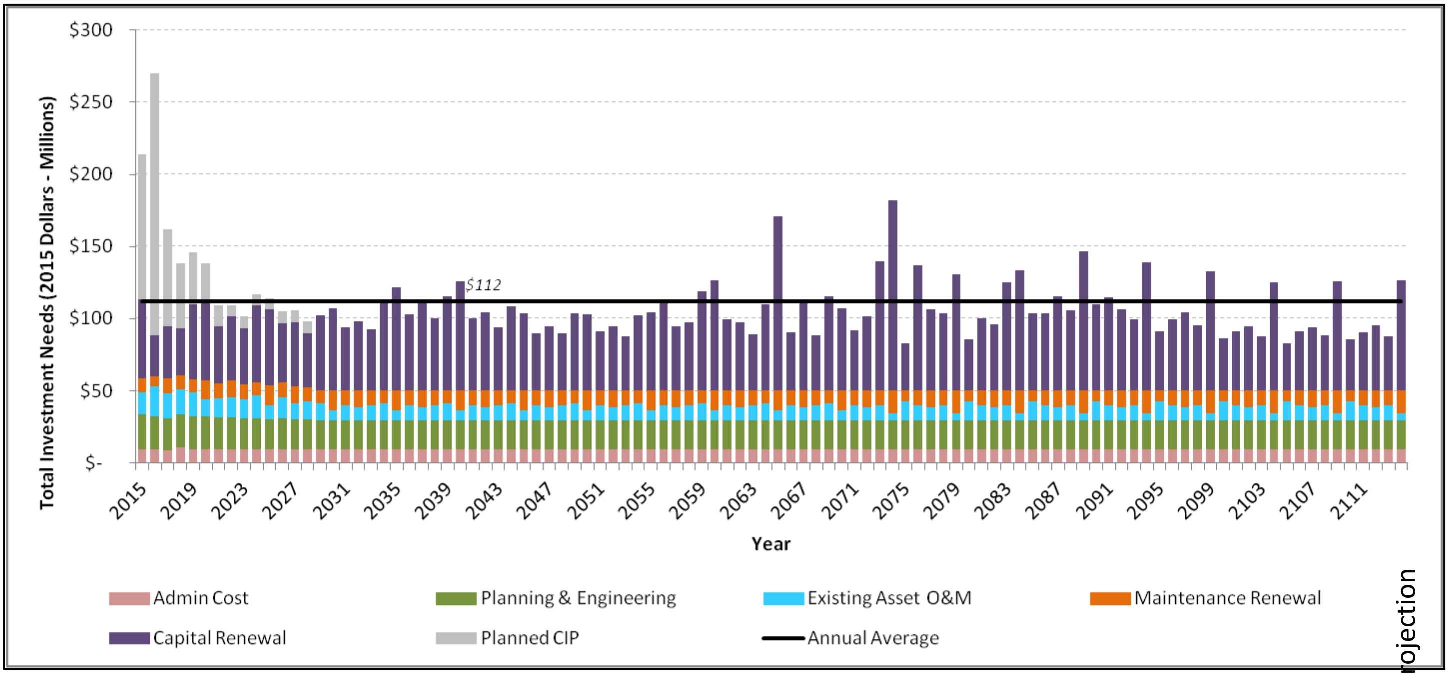


Table 6-4. Watershed Average Annual Expenditures

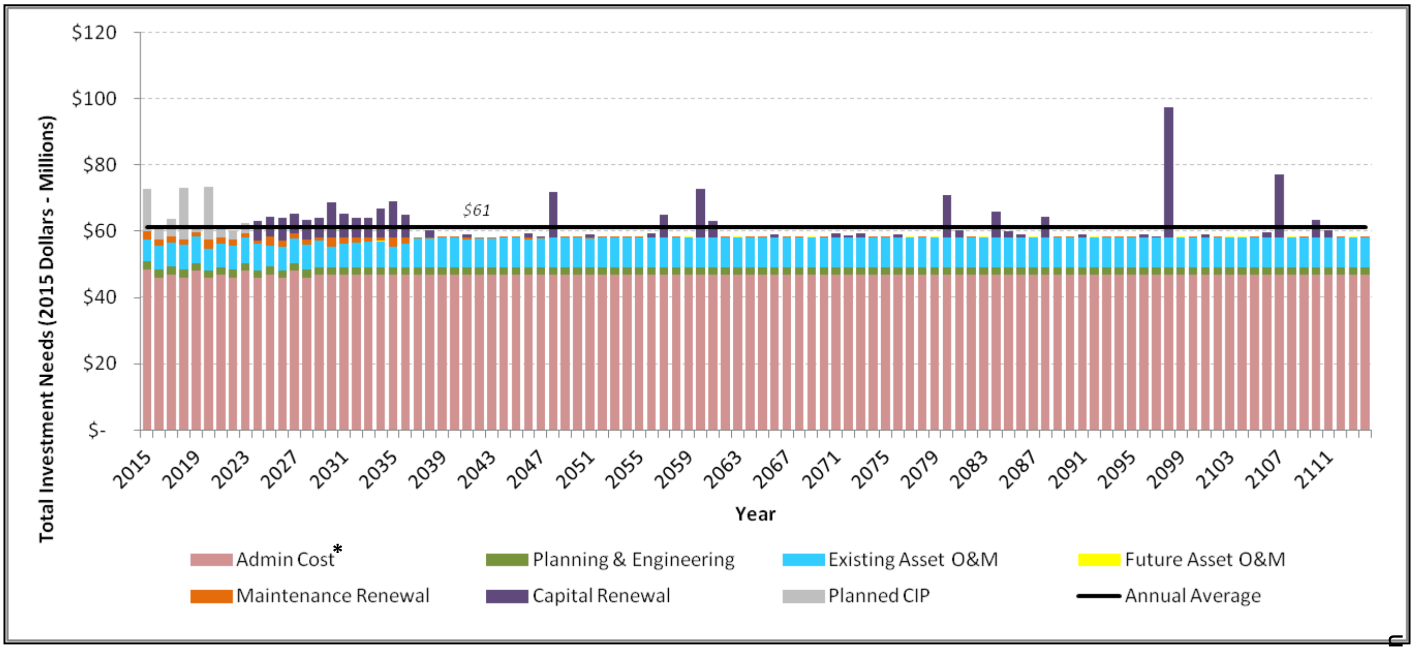
Planning Horizon	Annual Average							
	Admin Cost	Planning & Eng. Cost	Existing Asset O&M	Future Asset O&M	Maint. Renewal	Capital Renewal	Planned CIP	Total
10-year	$9,538,100	$22,622,300	$15,310,541	--	$43,514,422	$43,514,422	$49,483,600	$162,494,722
25-year	$9,394,040	$21,347,560	$12,358,422	--	$48,513,910	$48,513,910	$21,954,792	$128,390,110
50-year	$9,346,020	$20,793,780	$11,026,261	--	$50,039,539	$50,039,539	$10,753,367	$115,085,139
100-year	$9,322,010	$20,516,890	$10,297,196	--	$54,134,761	$54,134,761	$5,322,374	$111,765,061

6.3.3. Administration

The Administration projected 100-year renewal requirements are presented in Figure 6-4 and Table 6-5. The 100-year average annual expenditure for Administration renewals is $61 Million, which is 13 percent of the total District's 100-year average annual expenditure of $466 Million. As shown in Figure 6-4, the majority of annual expenditures for Administration remain constant over the planning horizon with the exception of the year 2098, which is attributable to the replacement of the District's Headquarters Building. Table 6-5 shows that the ten year annual average investment needed for administration is $66 Million, which is slightly higher than the 100 year average of $61 Million. The increased spending in the first 10-years is due to planned capital expenditures including replacement of the District's maintenance building.

The majority of Administration costs are related to administrative functions such as hiring, payroll, and information management that support the core businesses of providing safe, clean water, flood protection, and stream stewardship. These costs may grow over time due to inflation, and the District may need to pursue efficiencies and other measures to control administrative costs.

Figure 6-4. Administration Long-Range Investment Needs Projection



* Only a portion of these costs are included in the District-wide projection to avoid double counting of overhead costs. Overhead costs are already included in water utility and watershed operating budgets.

Table 6-5. Administration Average Annual Expenditures

Planning Horizon	Annual Average							
	Admin Cost*	Planning & Eng. Cost	Existing Asset O&M	Future Asset O&M	Maint. Renewal	Capital Renewal	Planned CIP	Total
10-year	$46,818,600	$2,405,800	$7,255,968	$4,000	$5,911,371	$5,911,371	$7,216,444	$66,166,937
25-year	$46,807,840	$2,371,400	$7,356,910	$7,600	$5,944,217	$5,944,217	$2,706,167	$64,955,899
50-year	$46,815,420	$2,359,700	$8,140,625	$8,800	$3,402,245	$3,402,245	$1,325,469	$62,477,641
100-year	$46,819,210	$2,353,850	$8,586,360	$9,400	$2,701,366	$2,701,366	$656,040	$61,414,143

*Only a portion of these costs are included in the District-wide projection to avoid double counting of overhead costs. Overhead costs are already included in water utility and watershed operating budgets.

7. Plan Recommendations

This chapter provides recommendations for improving the quality of future asset management plans, and more importantly, for improving the management of District assets. The chapter discusses the confidence level rating for the plan. This is a calculation that tells us how confident we are in different parts of the plan and indicates areas for improvement. This chapter then presents key plan findings, and recommendations for improvement based on those findings. The findings and recommendations are centered on the confidence level rating for the plan.

Confidence level rating is one of many ways the District can measure the quality of its Asset Management Program. The International Organization for Standardization (ISO) recently released a new international standard for asset management, ISO 55001. The District could use this standard as a benchmark for its asset management programs, whether it chooses to become certified or not. The District should review this standard to determine its usefulness in benchmarking or improving its asset management programs.

7.1. Confidence Level Rating

The confidence level rating provides an indication of the District's confidence in this Asset Management Plan. The confidence level rating also highlights areas where improvement to the District's asset management programs would be beneficial. Asset management program staff measured the confidence level for this plan using best judgment. The overall confidence level rating for the plan is 65 percent, which means the District is about 65 percent confident in the findings of the plan. The confidence level rating is based on six key elements, or rating criteria, listed below.

1. **Asset Inventory** – Measures the completeness of the asset data. (Did the asset register include all the assets the District owns? What percentage of assets may be missing? Did we capture all asset types?)
2. **Asset Valuation** – Measures the accuracy of the estimated replacement costs of the assets and systems. (How accurate is the estimated replacement cost of each asset?)
3. **Management Strategies** – Measures the accuracy of the renewal strategy used in the asset management plan. (How accurate are the strategies? How realistic are the expected lives? Was historical data used to develop the strategies?)
4. **Business Risk Exposure** – Measures the accuracy of the risk assessment performed. (Is the risk assessment representative of the actual risks? Does staff agree with the critical assets?)
5. **Levels of Service** – Measures the quality of the levels of service used to track asset performance. (Were the levels of service identified across all major asset systems? Do the levels of service link to actual asset performance?)
6. **Staff Participation and Buy-In** – Captures the staff involvement in developing the asset management plan and estimates the staff confidence in the quality of the asset management

plan. (Was key staff involved? Do staff members accept the results of the asset management plan?)

Asset management unit staff assigned a weighting factor to each confidence level element listed above. The weightings are presented in Table 7-1. The weighting factors quantify the importance of each element, with respect to the overall accuracy and quality of the asset management plan. For example, the weighting of Level of Service is lower than Asset Valuation, since Level of Service does not directly impact the accuracy of the future renewal funding requirement projections.

Table 7-1. Quality Element Weightings

Quality Elements	Weighting
Asset Inventory	30%
Asset Valuation	20%
Management Strategies	20%
Business Risk Exposure	10%
Levels of Service	10%
Staff Participation & Buy-In	10%
Total	**100%**

Asset management unit staff scored each quality element for each business area. Each business area is weighted equally[7]. The weighted scores are presented in Figure 7-1. The total weighted confidence level for the District-wide plan is 65 percent. An organization's first iteration of an asset management plan will seldom have good data to support the plan, and typically scores are between 50 percent and 60 percent. The confidence in this plan is slightly higher than expected, mostly due to the overall confidence level rating score of 73 percent for the water utility business area.

The area of highest confidence for each business area varies, but the area of lowest confidence was consistent for all business areas. All three business areas scored lowest in Business Risk Exposure because many assets are still missing risk scores, and existing risk scores need to be updated and validated. The areas of low confidence are addressed in Section 7.2 with recommended steps to improve the confidence and accuracy of future asset management plans and the asset management program.

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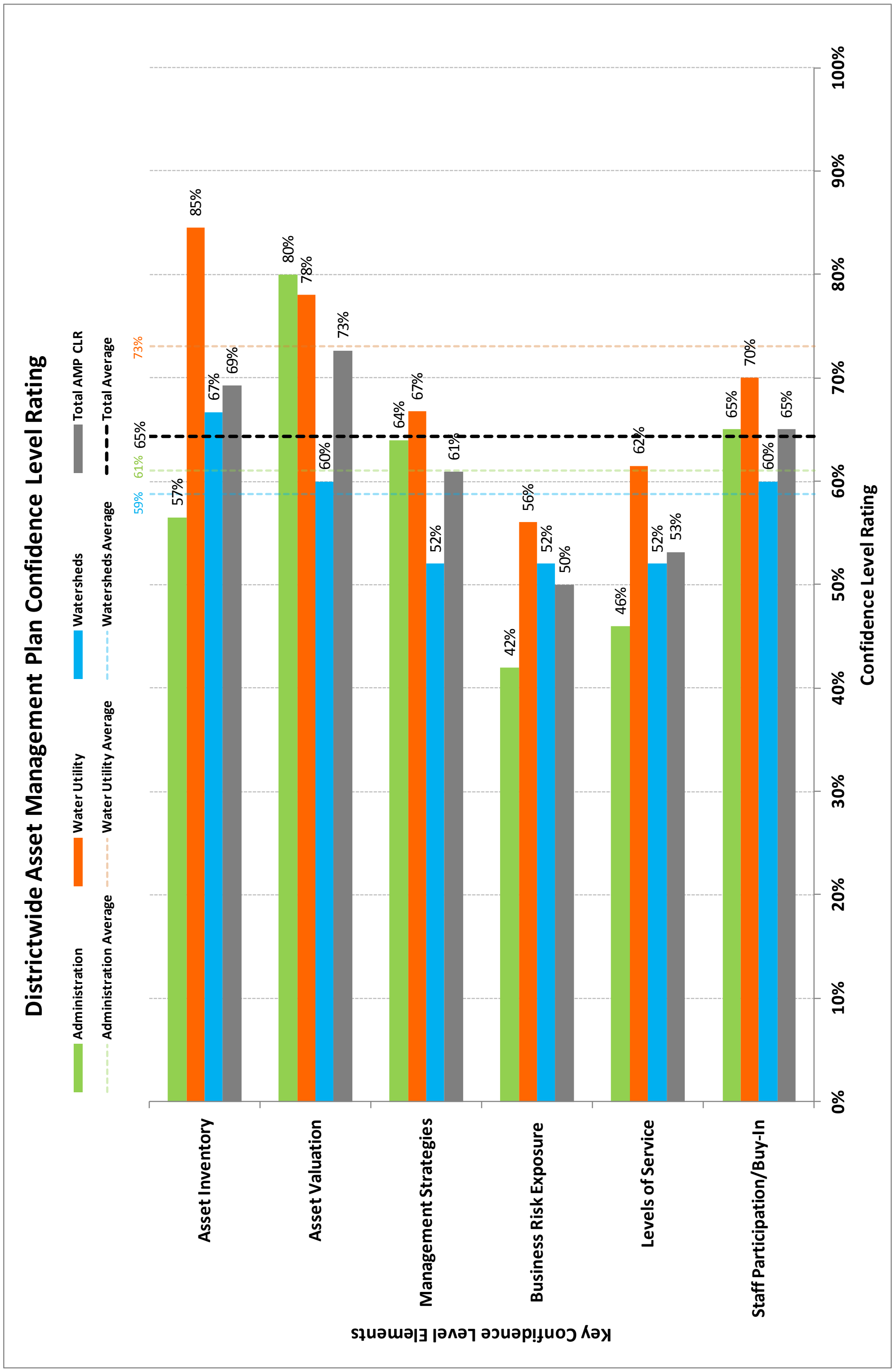
[7] By changing the weightings to match the percent value by business area (65% water utility, 32% watershed, and 3% administration), the confidence level rating increases slightly to 68%.

Figure 7-1. District-wide Asset Management Plan Confidence Level Rating

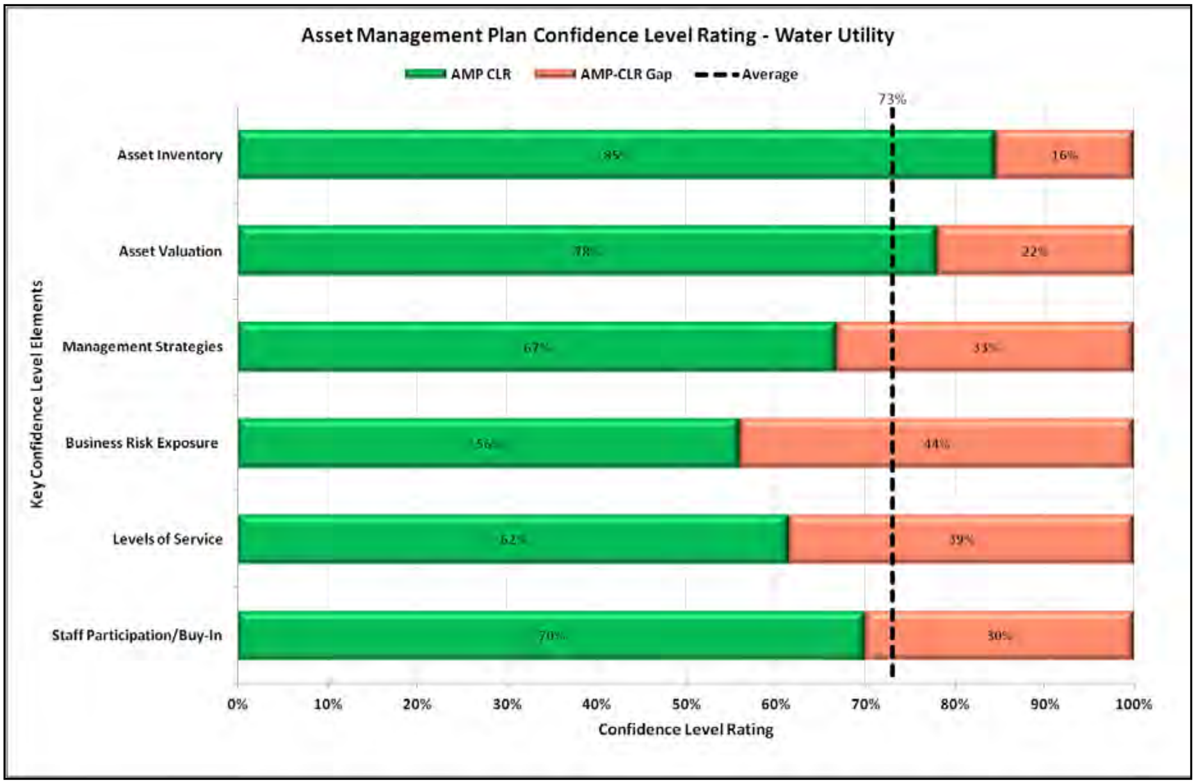


7.1.1. Water Utility Confidence Level

As shown in Figure 7-1 above and Figure 7-2 below, the total weighted confidence level for the Water Utility business area is 73 percent. Figure 7-2 shows the weighted score for each quality element in green, and the gap or difference from 100 percent in pink. The Water Utility's overall score of 73 percent is higher than expected for a first iteration of an asset management plan, and is likely due to the Water Utility having a functioning asset management program for the last ten years. Staff has high confidence in the Water Utility asset registry, which received a weighted score of 85 percent. Asset Valuation received a weighed score of 78 percent. For this plan, asset management staff updated many of the large civil asset replacement values.

Areas where the Water Utility can improve are in Business Risk Exposure and Levels of Service. Business risk scores are based on consequence of failure scores that were developed when the water utility asset management program began about 10 years ago, and should be updated. Additionally, some assets have not been scored and redundancy has not been incorporated. The utility can improve in the area of Levels of Service by defining and documenting asset specific levels of service. The areas of low confidence are addressed in Section 7.2 with recommended steps to improve the confidence and accuracy of future asset management plans and the water utility asset management program.

Figure 7-2. Water Utility Confidence Level Rating

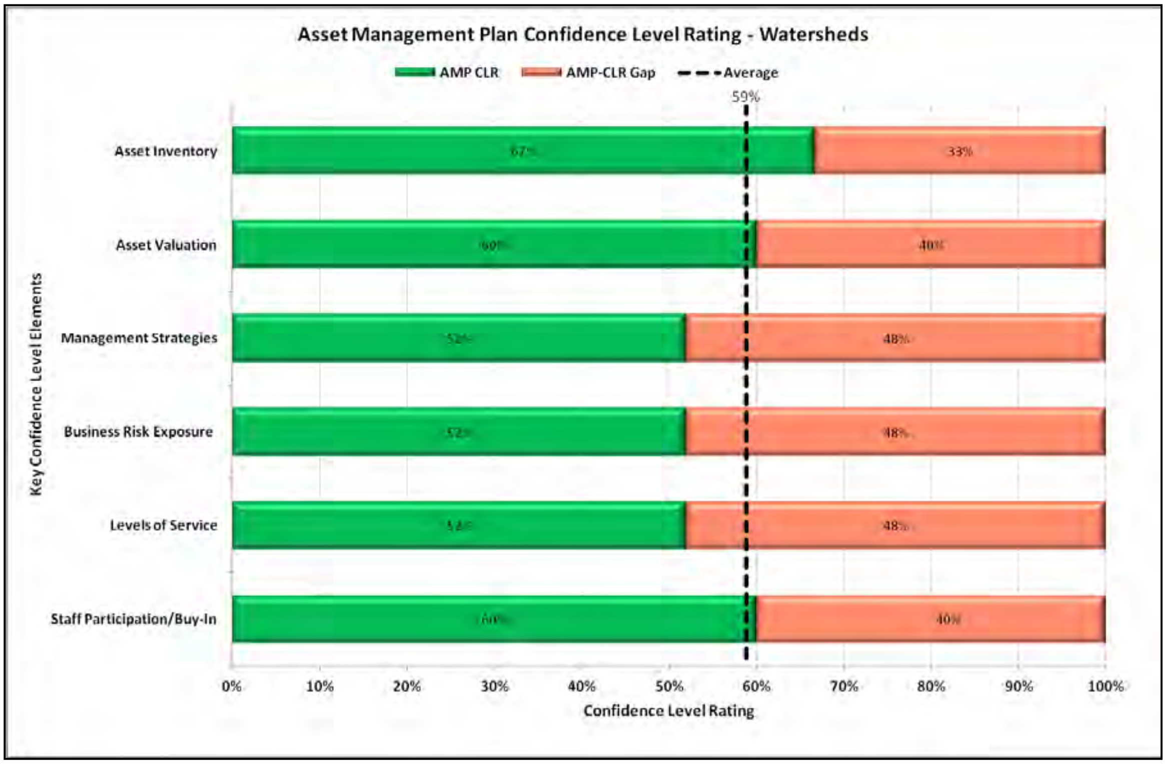


7.1.2. Watershed Confidence Level

As shown in Figure 7-1 above and Figure 7-3 below, the total weighted confidence level for the Watershed business area is 59 percent. The overall score of 59 percent is within the range of expectations for a first iteration of an asset management plan. The score is the lowest of the three District business areas. The Watershed program is mostly developed, but is still in early stages of implementation. Although the Administration program is still being developed and not yet implemented, it received a higher confidence level rating. This is primarily because the administration assets are constructed assets that are managed using standard asset management principals. Asset inventory, valuation, and management strategies are straightforward for administration assets. The watershed asset management program is one of the first programs of its kind. Not many other agencies use standard asset management principals to manage natural watershed assets.

The area of highest confidence for the Watershed business area is the Asset Inventory. The asset inventory was built using an existing District creek model (waterways management model), and by walking each creek and adding missing assets. The areas of lowest confidence for the Watershed business area are Management Strategies, Business Risk Exposure, and Levels of Service. Documenting levels of service for each creek requires significant research. Staff has completed level of service documentation for seven creeks so far. Management strategies are based on the researched levels of service, and therefore, have been optimized only for the same seven creeks. The areas of low confidence are addressed in Section 7.2 with recommended steps for improvement.

Figure 7-3. Watershed Confidence Level Rating



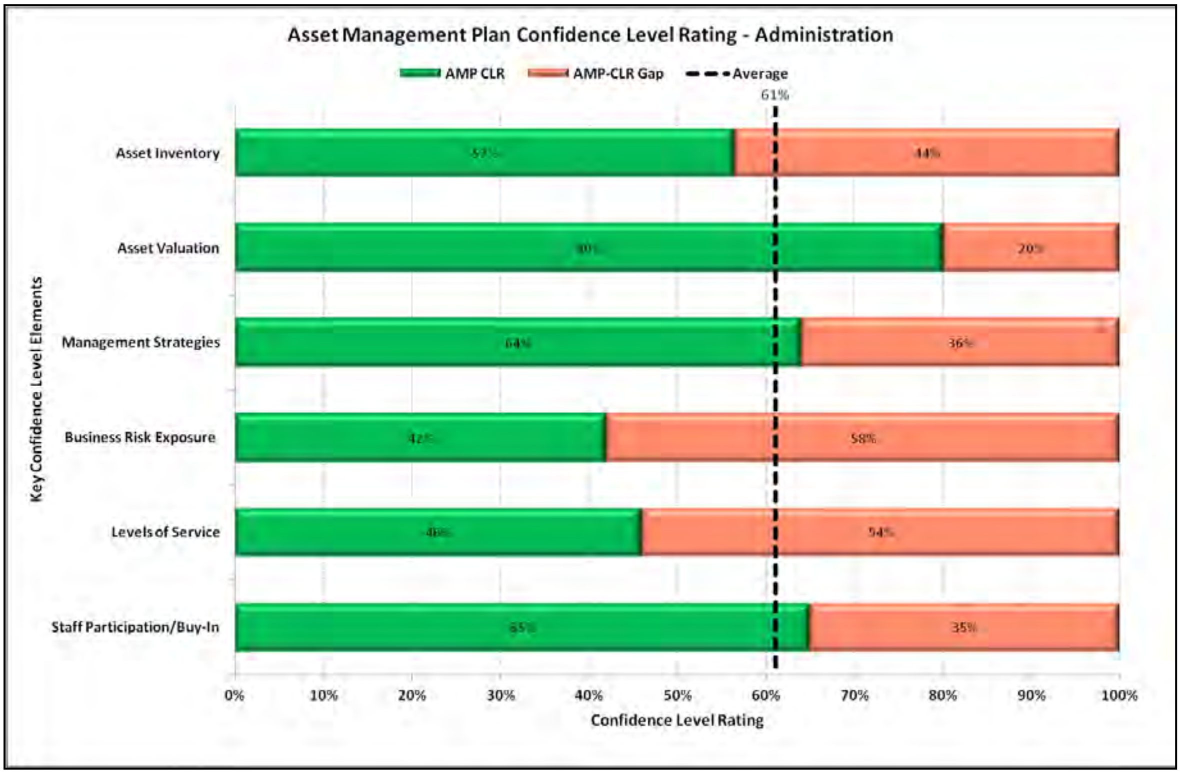
7.1.3. Administration Confidence Level

As shown in Figure 7-1 above and Figure 7-4 below, the total weighted confidence level for the Administration business area is 61 percent. The overall score of 61 percent is near the range of expectations for a first iteration of an asset management plan. Since the Administration program is still being developed and implemented, a first pass score of 61 percent is fairly good.

The areas of highest confidence for the Administration business area are Asset Valuation, Management Strategies, and Staff Buy-in. Although not all administration assets were included in the plan, as shown by the lower confidence in the Asset Registry, the value of these assets is thought to be highly accurate. Optimization of management strategies for administration assets does not require as much analysis as other business areas. Many of these assets such as servers or vehicles have standard maintenance practices and replacement intervals. Administration staff provided almost all of the data and information used in this plan.

The areas of lowest confidence for the Administration business area are Business Risk Exposure and Levels of Service. Business risk scores have not been validated for administration assets. Very few levels of service, even at board policy level, exist for administration assets. The areas of low confidence are addressed in Section 7.2 with recommended steps for improvement.

Figure 7-4. Administration Confidence Level Rating



7.2. Key Findings and Recommendations for Improvement

The key findings and recommendations presented in this section identify areas where improvements are needed in the District's asset management programs. This asset management plan is a snapshot of the asset management programs as they stand today, and findings in this plan point to areas where the programs need improvement. Improvements to the program will result in a more complete and accurate plan, and better management of District assets.

Two general recommendations not related to a specific element in the confidence level rating analysis are described below:

AM1. Review the ISO 55001 standard for asset management. Use the standard to benchmark the District's programs and determine where improvements are needed.

AM2. Implement maintenance and capital renewals as defined in each asset's management strategy. This is necessary for ensuring the District's assets will continue to provide service as needed.

Some additional general findings and recommendations are listed below in Table 7-2. These recommendations are common among all three business areas. Improvements specific to each business area are presented in sections 7.2.1 through 7.2.3. The following Chapter 8, Implementation Plan, discusses the suggested timing and staff responsible for each of these recommendations.

Table 7-2. General Findings and Recommendations

Key Element	Findings	Recommended Improvement
Asset Valuation (CLR = 73%)	Land makes up $3.7B (about one third) of the total value of all District assets; however, the land value estimates in this plan are based on several assumptions, and may not be entirely accurate.	**AM3.** Improve accuracy of land value estimates by confirming land use type for each parcel owned by the District, and current value per square foot of each land use type, using a high-level appraisal.
Level of Service (CLR = 53%)	This plan documents existing levels of service, but does not optimize or set new levels of service. This plan identifies only some asset-specific levels of service. Setting new levels of service requires considerable collaboration and discussion among District staff and external stakeholders. Identifying level of service for individual assets requires significant research and analysis of design criteria and maintenance data.	**AM4.** Develop a methodology for establishing and optimizing levels of service at an asset and facility level, and implement that methodology in the three business areas.

Key Element	Findings	Recommended Improvement
Business Risk **(CLR = 50%)**	• Business risk methodology has not been applied consistently across business areas. For example, a software program, such as PeopleSoft, could receive the same risk score as Anderson Dam. • Many business risk scores are missing, and many are outdated. The District has not yet incorporated redundancy into risk scores. • Risk thresholds were established based on judgment, and may need to be revised. The threshold for critical risk seems low at 60, and the window of moderate risk is small, only ten points out of 150.	**AM5.** Develop consistent criteria for measuring business risk, and apply the criteria consistently across all business areas. **AM6.** Develop risk scores for assets that have none, and update risk scores for all assets. Include the redundancy factor in updated or new risk scores. **AM7.** Establish new risk thresholds that are more distributed across the entire risk index.
Management Strategies **(CLR = 61%)**	• Prior to this plan, the District had not formally documented or optimized management strategies for most of its assets. Optimizing management strategies requires collecting and analyzing historical asset performance data. Validating and optimizing management strategies will improve the management of District assets, and also the quality of the financial projection provided in this plan. • A management strategy can be developed to account for different types of asset failures: physical mortality, capacity, level of service, or efficiency. Not all modes of failure were analyzed for all assets in this plan. • The District has not typically evaluated assets for decommissioning, even though it has some instances of assets where decommissioning may be the best management strategy. • The management strategies do not account for climate change in the future. Climate change impacts are expected to be significant over the next 100 years.	**AM8.** Document and optimize management strategies. The District needs to validate its management strategies to confirm the existing strategies are appropriate, and to optimize management strategies, particularly for more critical and higher value assets, such as dams, pipelines, and levees. **AM9.** Analyze all failure modes for each asset to determine the most eminent failure mode, and ensure the asset's management strategy addresses that failure mode. **AM10.** Educate staff on the concept of asset decommissioning, and importance of evaluating decommissioning in the project validation process. Develop a more robust process if needed. **AM11.** Begin to research and identify potential climate change impacts on District assets, particularly extreme heat and sea level rise. Determine how to incorporate these into asset management strategies.

Key Element	Findings	Recommended Improvement
Financial Projections **(CLR = N/A)**	• The financial projection uses current District budgets for future operations, maintenance, planning, and engineering costs, which do not provide costs based on actual management strategies. • The financial model used for this plan categorizes all infrastructure investments greater than $50,000 as capital renewals, when many would be done in operating budgets.	**AM12.** Work towards using the asset management plan to create operations, maintenance, planning, and engineering budgets, rather than the budgets being used to create the plan. **AM13.** Refine the financial model to better categorize capital versus maintenance renewal projects.
Staff Participation **(CLR = 65%)**	Asset Management Unit staff received guidance from District management throughout development of the plan through regular Asset Management Steering Committee and Leadership Team meetings. Engineering, operations and maintenance staff were consulted for specific aspects of the plan, but not the plan in entirety.	**AM14.** In future plans, engage engineering, operations, and maintenance staff as stakeholders throughout plan development. Then, use these stakeholders to develop confidence level element weightings and ratings.

7.2.1. Water Utility Findings and Recommended Improvements

The Water Utility's asset management program has been in place for over ten years. Consequently, the confidence level rating for the Water Utility component of this asset management plan was higher than other District business areas, at 73 percent. Even so, staff identified several areas of improvement (in addition to the 15 general recommendations in section 7.2) for the Water Utility program throughout the development of this plan. The findings and recommendations are presented in Table 7-3 below.

Table 7-3. Water Utility Findings and Recommendations

Key Element	Findings	Recommended Improvements
Asset Inventory **(CLR = 85%)**	The asset register is mostly complete. Old assets are decommissioned and new assets are added daily, as maintenance or capital work is completed. Although each asset has a record in the registry, the data included in each asset record is not complete or consistent in many cases. Improving data quality will help maintenance staff in performing their daily work.	**WU1.** Develop a detailed registry for facilities listed in Table 2-2 in Maximo. **WU2.** Improve asset record data by adding or confirming asset attributes including installation date, manufacturer, serial number, size, type, and other defining characteristics as needed.
Asset Valuation **(CLR = 78%)**	Many, but not all water utility asset replacement values were updated for this plan.	**WU3.** Continue on-going efforts to update and refine asset replacement values based on actual or researched costs.
Management Strategies **(CLR = 67%)**	District staff identified some facilities for which decommissioning might be the best management strategy. These assets are described in Section 5.6 and include the out of service canals, Anderson hydroelectric facility, and Penitencia Water Treatment Plant.	**WU4.** Further study the out of service canals, Anderson hydroelectric facility, and Penitencia Water Treatment Plant for potential decommissioning now or at end of life. Study cost of decommissioning versus cost of continued renewal of these assets.

7.2.2. Watershed Findings and Recommended Improvements

The Watershed asset management program is in the early stages of implementation, and the confidence level rating is the lowest of the three District business areas, at 59 percent. The score indicates that there are many areas where the program can improve. In addition to the improvements identified in Table 7-2, the improvements specific to the watershed program are presented in Table 7-4 below.

Table 7-4. Watershed Findings and Recommendations

Key Element	Findings	Recommended Improvements
Asset Inventory **(CLR = 67%)**	The asset register is complete for each creek to the bed and bank level. Several point assets beyond the bed or bank level, such as outfalls, stream gauges, and fish passage facilities, are not included in the registry. Additionally, the count of mileage of channel by type needs to be validated. Ecological assets are not currently included, and need to be added to the registry and program.	**WS1.** Continue to add point assets to the registries. Assets are typically added during annual creek inspections via mobile devices to capture their geospatial location. **WS2.** Confirm the miles of channel by type (natural, constructed, levee, etc.) and determine how to add this information in Maximo. **WS3.** Develop and implement a plan for adding ecological assets to the inventory.
Asset Valuation **(CLR = 60%)**	The total value of some assets such as natural creek channels and ecological assets are not included in this plan. The maintenance costs are captured in the financial forecast; and the land under the assets are captured in the asset valuation. In addition, values of constructed assets including concrete channels were estimated, and need to be validated.	**WS4.** Continue working with other agencies to develop a methodology and to value natural assets such as the creeks and ecological assets. **WS5.** Validate and update constructed asset values, including concrete channel replacement values.
Levels of Service (CLR = 52%)	Establishing level of service for watershed assets requires extensive research into engineering drawings and board approved documents. Creeks with established level of service to date include Guadalupe, Stevens, Uvas, Canoas, and Upper Penitencia Creeks. Levels of service for all other District creeks have not been established.	**WS6.** Continue work to establish levels of service for all remaining creeks. Current pace based on staff resource availability is one to two creeks per year.

Key Element	Findings	Recommended Improvements
Business Risk (CLR = 52%)	Consequence and probability of failure are difficult to determine at the creek, reach, and sub-reach level.	**WS7.** Update risk scores for all watershed assets by working with technical experts to determine consequence and probability of failure at the creek, reach, and sub-reach levels.
Management Strategies **(CLR = 52%)**	Work to develop management strategies for all creeks is underway, and will proceed in conjunction with establishment of levels of service. The District has not started developing management strategies for ecological assets. The EMAP project will develop strategies for ecological assets.	**WS8.** Continue work to develop management strategies for each creek, and continue development of EMAP program to manage ecological assets.

7.2.3. Administration Findings and Recommended Improvements

The Administration asset management program is still being developed; however, the confidence in the program was rated slightly higher than the watershed program, at 61 percent. This is primarily due to the fact that it is easier to value and develop management strategies for the Administration assets. In addition to the recommendations in Table 7-2, staff identified several areas of improvement for the Administration program, primarily related to continuing development of the program. The findings and recommendations are presented in the table below.

Table 7-5. Administration Findings and Recommendations

Key Element	Findings	Recommended Improvements
Asset Inventory **(CLR = 57%)**	The asset registries for fleet, equipment, information systems, and information technology are substantially complete. The administration building systems such as HVAC and plumbing are not included in the asset inventory.	**AD1.** Develop complete asset inventories for all facilities assets, starting with a pilot study of the District's headquarters building.
Asset Valuation **(CLR = 80%)**	Replacement value for fleet and IT/IS assets are typically equal to the purchase price of a new asset and are generally accurate. Replacement values for facilities assets such as buildings and their systems are not as easily determined.	**AD2.** Develop valuation estimates for all facilities assets, starting with a pilot study of the District's headquarters building.
Levels of Service (CLR = 46%)	District Board Policy does not directly identify outcome measures or specific level of service goals for administration assets. The administration business area develops internal service goals for its customers, and some regulations set service goals. Both high level and asset specific level of service goals need to be established for the Administration assets.	**AD3.** Identify any Board Policy changes needed to address management of Administration assets. **AD4.** Research and document level of service goals for specific assets, according to a standard methodology, as indicated in AM3. This recommendation is meant to be completed over time, and is not likely needed for all assets.
Management Strategies **(CLR = 64%)**	Management strategies for fleet and IT/IS assets are generally based on established routine maintenance schedules and are generally accurate. Strategies for facilities assets such as buildings and their systems are not as easily determined, and need to be developed.	**AD5.** Develop management strategies for all facilities assets, starting with a pilot study of the District's headquarters building.

8. Implementation Plan and Next Steps

This chapter provides an implementation plan for the recommendations identified in Chapter 7. Implementing these actions will improve the quality of the District's asset management programs, the confidence in future iterations of asset management plans, and the overall management of the District's assets. The recommendations are presented in Table 8-1 through Table 8-4 below, with a start date, duration, and the suggested unit responsible for implementing the actions.

Some of the recommendations are ongoing, meaning work has already commenced on the recommendation, or work will continue for at least another five years until the next Asset Management Plan update. These recommendations will be tracked by the Asset Management Unit, and re-evaluated in the next Asset Management Plan update in five years. Many of the recommendations have already been included in Asset Management Unit budgets and project plans for next year.

The two areas requiring the most improvement in the District's asset management programs are risk and level of service. The Asset Management Unit intends to spend considerable time over the next few years developing a reliable and valid risk profile for all District assets, and in establishing levels of service at the asset or facility level.

Table 8-1. District-wide Recommendations

Recommended Improvement	Start Date	Duration	Responsible Units
AM1 – Review ISO55001 and use the standard to benchmark District's AM programs.	July 2015	1 year	Asset Management Unit
AM2 – Implement maintenance and capital renewals	July 2014	Ongoing	Capital, Engineering, Operations, Maintenance
AM3 – Improve accuracy of land value	July 2015	1 year	Asset Management Unit; Real Estate Unit
AM4 – Develop and implement methodology to establish asset specific levels of service	July 2015	3 years	Asset Management Unit
AM5 – Develop standard risk assessment criteria	July 2014	1 year	Asset Management Unit
AM6 – Develop and update asset risk scores	January 2015	2 years	Asset Management Unit
AM7 – Establish new risk thresholds	July 2015	6 months	Asset Management Unit
AM8 – Document and optimize management strategies	January 2015	Ongoing	Asset Management Unit; Engineering Support Units
AM9 – Analyze multiple failure modes	July 2015	Ongoing	Asset Management Unit;
AM10 – Implement process to consider asset decommissioning as part of project planning	December 2015	1 year	Asset Management Unit
AM11 – Incorporate climate change impacts into management strategies	July 2016	Ongoing	Asset Management Unit; Climate Change Committee
AM12 – Use asset management plan to create operations budgets rather than using budgets to create plan	July 2016	Ongoing	Asset Management Unit
AM13 – Refine the financial model to better capture capital vs. maintenance costs	July 2014	1 year	Asset Management Unit
AM14 – Engage staff throughout asset management plan development	July 2014	Ongoing	Asset Management Unit

Table 8-2. Water Utility Recommendations

Recommended Improvement	Start Date	Duration	Responsible Units
WU1 – Develop detailed registry for facilities in Table 2-2 in Maximo	January 2015	1 year	Asset Management Unit; Water Utility Engineering, and Maintenance Units
WU2 – Improve asset data (add asset attributes) in Maximo	January 2015	10 years	Asset Management Unit; Water Utility Engineering, and Maintenance Units
WU3 – Update replacement values	Ongoing	Ongoing	Asset Management Unit; Water Utility Engineering, and Maintenance Units
WU4 – Study assets for potential decommissioning	July 2016	2 years	Asset Management Unit; Water Utility Engineering, and Maintenance Units

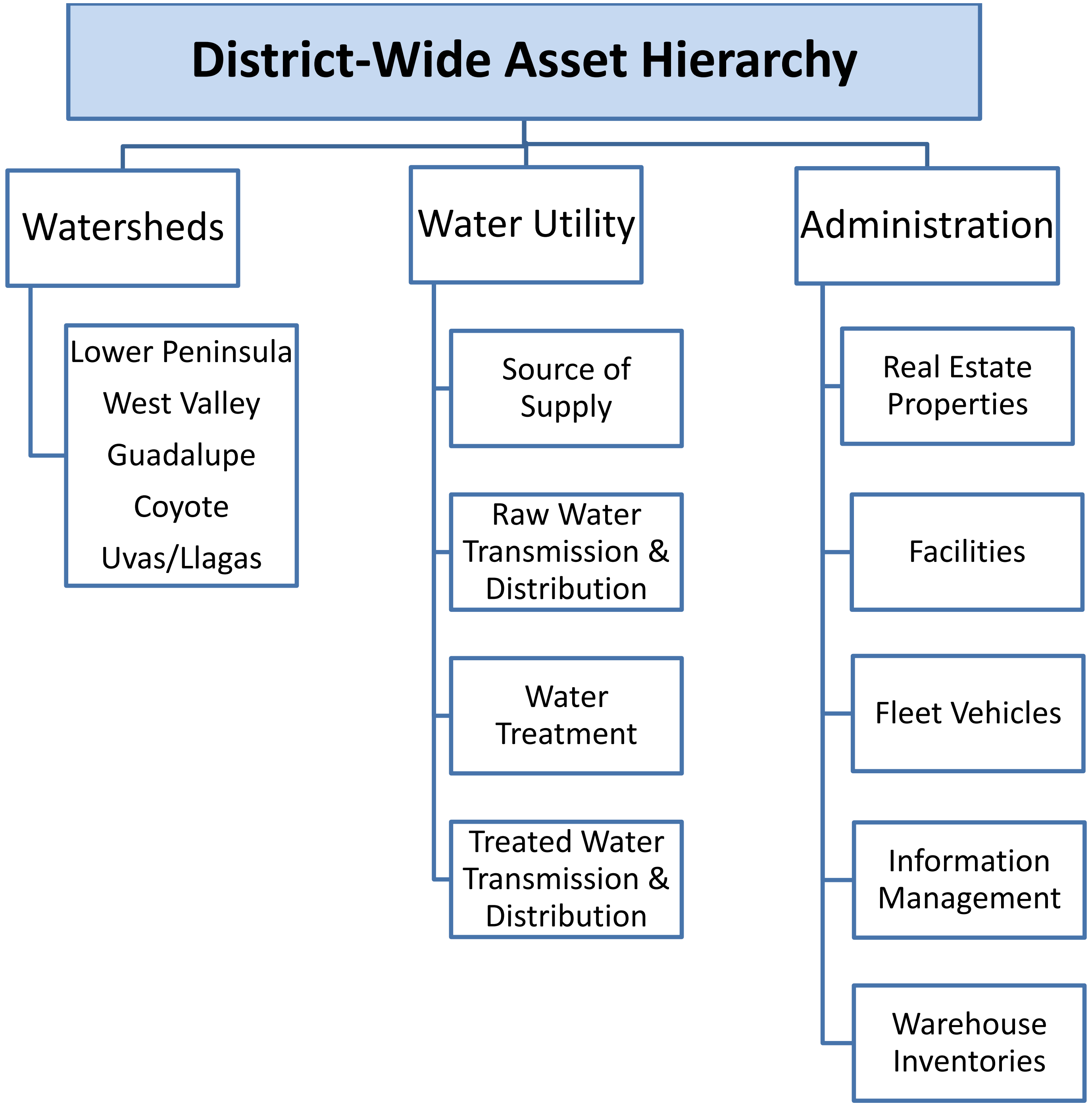
Table 8-3. Watershed Recommendations

Recommended Improvement	Start Date	Duration	Responsible Units
WS1 – Add point assets to Maximo	Ongoing	Ongoing	Watershed Operation & Support Engineering Unit
WS2 – Validate miles of channel type	July 2014	1 year	Asset Management Unit
WS3 – Develop ecological asset inventory	July 2015	3 years	Environmental Mitigation and Monitoring Unit
WS4 – Develop valuation methods for natural assets	July 2014	3 years	Integrated Water Resources Master Plan Team; Asset Management Unit
WS5 – Update constructed asset replacement values	July 2015	1 year	Asset Management Unit
WS6 – Establish LOS for major creeks	Ongoing	5 years	Asset Management Unit; Watershed Operation & Support Engineering Unit
WS7 – Update BRE (risk) scores at creek, reach and subreach level	Ongoing	5 years	Asset Management Unit; Watershed Operation & Support Engineering Unit
WS8 – Develop management strategies for major creeks	Ongoing	5 years	Asset Management Unit; Watershed Operation & Support Engineering Unit

Table 8-4. Administration Recommendations

Recommended Improvement	Start Date	Duration	Responsible Units
AD1 – Develop complete asset inventories for buildings	Ongoing	2 years	Asset Management Unit; Facilities Management Unit; IT/ISS Units, Equipment Management Unit
AD2 – Develop replacement value estimates for all facilities assets	July 2015	1 year	Asset Management Unit; Facilities Management Unit
AD3 – Identify changes to Board Policies to address administration assets	May 2015	1 year	Asset Management Unit; Facilities Management Unit; IT/ISS Units, Equipment Management Unit
AD4 – Document LOS goals	July 2015	Ongoing	Asset Management Unit; Facilities Management Unit; IT/ISS Units, Equipment Management Unit
AD5 – Develop Management Strategies for all facilities assets	July 2015	Ongoing	Asset Management Unit; Facilities Management Unit

APPENDIX ONE – HIERARCHY



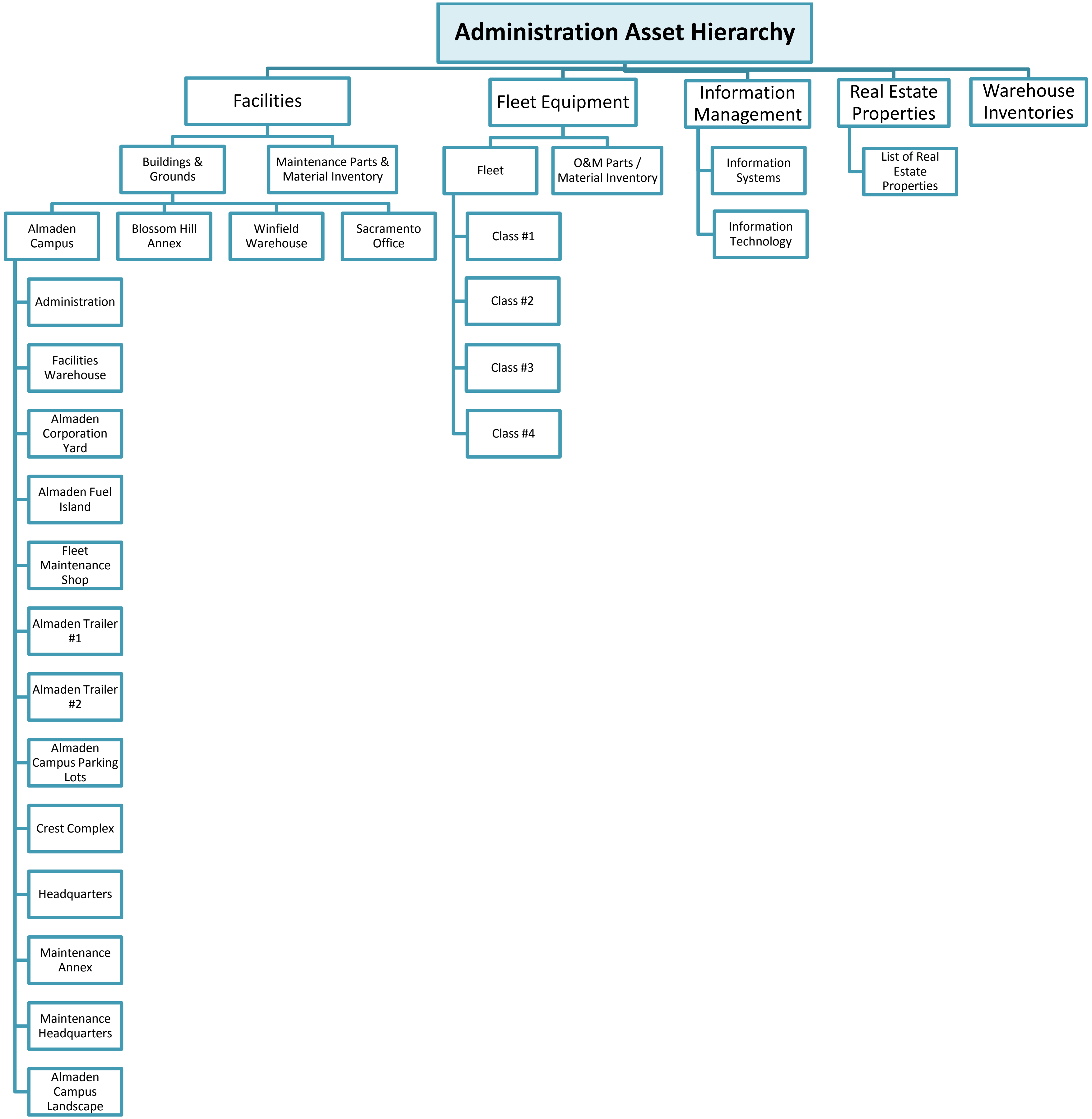
District-Wide Asset Hierarchy

- Watersheds
  - Lower Peninsula
  - West Valley
  - Guadalupe
  - Coyote
  - Uvas/Llagas
- Water Utility
  - Source of Supply
  - Raw Water Transmission & Distribution
  - Water Treatment
  - Treated Water Transmission & Distribution
- Administration
  - Real Estate Properties
  - Facilities
  - Fleet Vehicles
  - Information Management
  - Warehouse Inventories

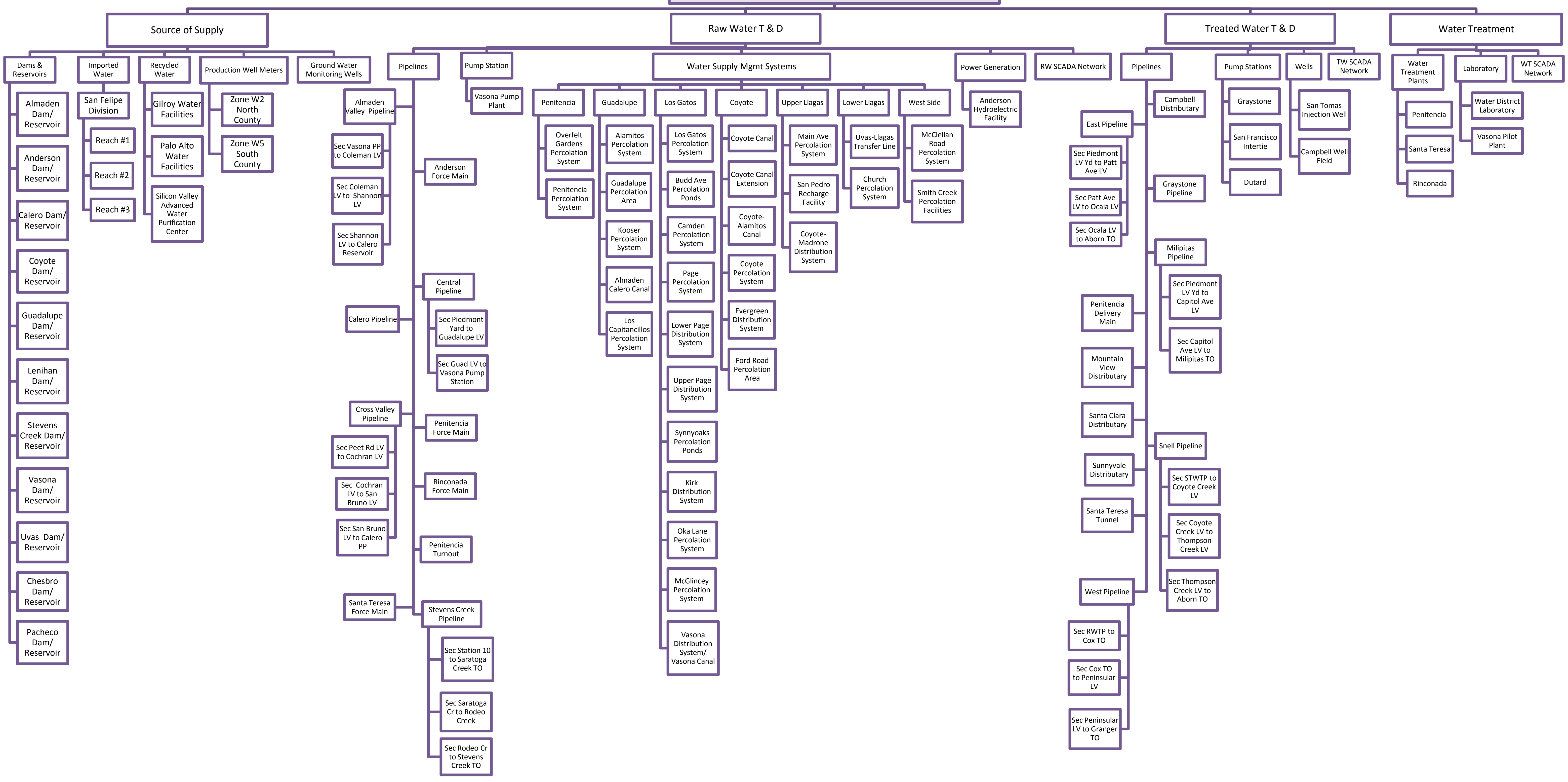
Updated July 2014

Watersheds Asset Hierarchy

- Lower Peninsula Wshd
  - Adobe
  - Arastradero
  - Barron
  - Deer
  - Hale
  - Heney
  - Los Trancos
  - Loyola
  - Magdalena
  - Matadero
  - Montebello
  - Ohlone
  - Palo Alto
  - Permanente Diversion Channel
  - Permanente
  - Purrissima
  - San Francisquito
  - Stevens
  - Summerhill
  - Swiss
  - West Branch
- Coyote Wshd
  - Arroyo Aguague
  - Berryessa
  - Calera
  - Cochran Channel
  - Coyote
  - Cribari
  - Crosley
  - Evergreen
  - Fisher
  - Flint
  - Fowler
  - Hawk
  - Las Animas
  - Los Buelis
  - Los Coches
  - Lower Penitencia
  - Lower Silver
  - Miguelita
  - Misery
  - North Babb
  - Norwood
  - Packwood
  - Penitencia East Channel
  - Piedmont
  - Quimby
  - Ruby
  - San Felipe
  - Scott
  - Shingle
  - Sierra
  - South Babb
  - Spring
  - Sweigert
  - Thompson
  - Tularcitos
  - Upper Penitencia
  - Upper Silver
  - Willow Springs
  - Wrigley-Ford
  - Yerba Buena
- Guadalupe Wshd
  - Alamitos
  - Aldercroft
  - Almendra
  - Audtrian Gulch
  - Barrett Canyon
  - Briggs
  - Calero
  - Canoas
  - Chilcote
  - East Ross
  - Golf
  - Greystone
  - Guadalupe
  - Guadalupe River
  - Hendrys
  - Herbert
  - Hicks
  - Hooker
  - Jacques Gulch
  - Larabee Gulch
  - Laurel
  - Limekin Canyon
  - Lone Hill
  - Los Capitancillos
  - Lyndon
  - McAbee
  - Moody Gulch
  - Pheasant
  - Randol
  - Rincon
  - Ross
  - Santa Teresa
  - Shannon
  - Soda Spring
  - Trout
- Pajaro Wshd
  - Alamias
  - Babbs
  - Bodfish
  - Burchell
  - Church
  - Corralitos
  - Crew
  - Croy
  - Day
  - Dewitt
  - Dexter
  - East Little Llagas
  - Eastman Canyon
  - Edmundson
  - Foothill
  - Gavian
  - Hayes
  - Heron
  - Jones
  - Lions
  - Little Arthur
  - Live Oak
  - Llagas
  - Lower Miller Slough
  - Machado
  - Madrone Channel
  - Maple
  - McLean
  - Milias
  - New Creek
  - North Morey Channel
  - Ortega
  - Pacheco
  - Pajaro
  - Panther
  - Paradise
  - Princevalle Drain
  - Rucker
  - San Martin
  - San Ysidro
  - Sargent
  - Skillet
  - Solis
  - South Corralitos
  - South Morey Channel
  - Sycamore
  - Tar
  - Tennant
  - Tick
  - Tilton
  - Upper Miller Slough
  - Uvas
  - West Branch Llagas
  - West Little Llagas
- West Valley Wshd
  - Bonjetti
  - Booker
  - Calabazas
  - Daves
  - E Branch El Camino Storm Drain
  - El Camino Storm Drain
  - Guadalupe Slough
  - Junipero Serra Channel
  - Page Ditch
  - Prospect
  - Regnart
  - Rodeo
  - San Andreas
  - Sanborn
  - San Thomas Aquino
  - Saratoga
  - Smith
  - Sobey
  - Sunnyvale East Channel
  - Sunnyvale West Channel
  - Vasona
  - Wildcat


Administration Asset Hierarchy
Facilities
Fleet Equipment
Information Management
Real Estate Properties
Warehouse Inventories
Buildings & Grounds
Maintenance Parts & Material Inventory
Fleet
O&M Parts / Material Inventory
Information Systems
Information Technology
List of Real Estate Properties
Almaden Campus
Blossom Hill Annex
Winfield Warehouse
Sacramento Office
Class #1
Class #2
Class #3
Class #4
Administration
Facilities Warehouse
Almaden Corporation Yard
Almaden Fuel Island
Fleet Maintenance Shop
Almaden Trailer #1
Almaden Trailer #2
Almaden Campus Parking Lots
Crest Complex
Headquarters
Maintenance Annex
Maintenance Headquarters
Almaden Campus Landscape

Water Utility Asset Hierarchy



APPENDIX TWO – REPLACEMENT COST ASSUMPTIONS

Table 1. District-wide Asset Management Plan Cost Assumptions

Asset Category	Cost Assumption
General	• Replacement Cost = Installation Cost + Equipment Cost. • Unless otherwise noted, Installation cost is estimated as a PERCENTAGE of equipment cost. ○ For non-capital replacements (replacement value less than $50,000), Installation cost = 35% of equipment cost ○ For capital replacements (replacement value of $50,000 or more), Installation Cost = 100% of equipment cost • The installation cost includes capital planning, design, permitting, construction management, and close-out
Tunnels	• Total replacement cost estimate based on Hetch-Hetchy tunnel replacement cost: $324 Million for 3.5 miles of 8.5-foot diameter tunnel • $172 per inch diameter per foot. Total replacement cost includes planning, design, construction • Equipment cost is back-calculated from total replacement cost = 40% total replacement cost • Installation cost = 1.5 times equipment cost (so, total replacement cost = 2.5 times equipment cost)
Pipelines	• Cost includes pipe cylinder replacement only • Vaults and other appurtenances are listed as separate assets • Each vault and valve adds $35,000 - $100,000 to the total pipeline replacement cost • Assume all pipe types are replaced with steel pipe • Steel pipe cost taken from 2007 purchase of spare pipe • Spare pipe was designed for actual pipeline pressures, so pricing accounts for required thickness of steel pipe • 2007 dollars were inflated to 2014 dollars • Installation cost = 2.5 times equipment cost to account for planning, design, permitting, and construction management, as well as additional construction materials: shoring, bedding, excavation, fill, and construction work: trenching, traffic control, etc (so, total replacement cost = 3.5 times equipment cost)
Line valves and vaults	• For all valves & vaults (even if non-capital/less than $50,000), Installation Cost = 100% of equipment cost • Buried assets have higher installation cost • Valve cost data was taken from ICAM • Cost for larger valves (36-inch and above) were validated against valve purchase data from 2007
Pacheco tunnel structures: inlet, gate shaft, surge	• Gate shaft and surge structure are estimated at $10 Million total replacement cost • Large concrete structures extending hundreds of feet below ground • Inlet structures are only $500,000 equipment cost, but have high installation cost due to location at bottom of reservoir

Asset Category	Cost Assumption
Treatment Basins	Above ground treatment basins are estimated at $2 Million each total replacement cost. (Example: Total replacement cost for the filters at STWTP would be 6 times $2 Million = $12 Million for the East and $12 Million for the West filters)
Control Buildings	• Each Building (Pacheco PS, Coyote PS, PWTP, RWTP, STWTP, Vasona PS) is estimated at $5 Million total replacement cost. • Costs will be refined based on building size for next plan iteration.
Santa Teresa and RWTP Clearwells (enclosed and/or buried)	• Santa Teresa clearwell is estimated at $12 Million total replacement cost - large underground concrete tank • RWTP clearwells are smaller, and estimated at $6 Million each
Above ground tanks - PWTP Clearwell, PPP Regulating Tank, SBA Tank,	Estimated at $6 Million total replacement cost each
Almaden Buildings	• See Table 2 for costs of each building and square footage • Costs were estimated using price per square foot for similar buildings
IT/hardware	• Installation cost set at $300 for all equipment - one to two hours of labor • Rehab Cost = annual maintenance agreement cost, and cycle is every year • For unknown annual maintenance cost, assumed 10% of equipment cost • Assets with no replacement cost are old and will be decommissioned at end of life • Assets have not been replaced according to replacement schedule (should be a backlog for 2014)
IS/software	• No installation cost - cost of implementing software is included in "total replacement cost" • Rehab Cost = annual maintenance agreement cost and cycle is every year • If unknown, maintenance cost is estimated at $5,000 for custom solutions, or $50,000 for commercial off the shelf products • If unknown, replacement cost is assumed to be 20 times annual maintenance cost • Most custom applications will be replaced by being rolled into a larger system such as Maximo, PeopleSoft, or ECM. The custom applications were estimated at a $5,000 maintenance and $100,000 replacement cost (see previous two assumptions). Adding together all the $100,000 replacements should be sufficient to account for rolling these into one more expensive application. • Cost and replacement info will be refined in FY15 when more work is done on IS register. • Installation dates were unknown, so assumed varying years between 2005 – 2010 • SCADA is included in other utility assets

Asset Category	Cost Assumption
Water Supply Management System	Culverts were estimated at $1.1 Million each. This cost may be refined in the next plan iteration based on watershed asset management plan findings on concrete channel replacement costs.
Dams and Reservoirs	• Dam rehabilitation costs are estimated based on current seismic retrofit costs - Approximately $100 Million each for Anderson & Calero • Dam replacement costs are estimated based on other projects: SFPUC Calaveras Dam replacement = $400 Million, Estimated Pacheco Reservoir Expansion Cost = $650 Million • Total Dam replacement cost = Dam structure plus upstream & downstream faces, which totals closer to the $400 Million • Dam inlet and outlet structures, and pipes replacement cost estimates were developed in 2010, and could be refined in future plans
Out of Service Canals	• Assume annual rehabilitation equal to cost of average work order cost per year • No replacement assumed, but estimated replacement cost of $5 Million per canal included in asset valuation
Fleet and Equipment	• Equipment cost is annual equipment replacement cost taken from 2014 budget, and is included in the financial model as an annual rehabilitation cost • O&M costs are shown on the O&M page, and were taken from 2015 budget/project plans
Land	• Land value is estimated by land use type. See Table 3 for detailed cost information • Land maintenance is included in O&M costs, but land does not carry a replacement or rehabilitation value • Much District owned land is not categorized by land use type. It is "NULL" or "POEXEMPT". Initial first cut estimate of $10 is used as cost/sq.ft. for uncategorized land. This land can be categorized and assigned more accurate values in the next plan update • Land value breakdown by business area has been estimated using following percentages: Water Utility = 40%, Watersheds = 50%, Administration = 10%. These will be refined in future plans

Asset Category	Cost Assumption
Operations & Maintenance	Annual O&M cost is from 2015 project plans Water Utility: • All projects are included (non-allocated & recipient) from funds 61 and 63 • These projects include money for maintenance renewals that is also counted in the 100 year forecast as maintenance renewals • As such, average annual maintenance renewal cost from 100 year forecast is subtracted from total O&M so maintenance renewals aren't double counted Watersheds: • All projects are included (non-allocated & recipient) from funds 12 and 26 • These projects include money for maintenance renewals that is also counted in the 100 year forecast as maintenance renewals • As such, average annual maintenance renewal cost from 100 year forecast is subtracted from total O&M so maintenance renewals aren't double counted Administration: • In the Administration Business Area projection, all projects from funds 11, 71, and 72 are included • In the District-wide projection, only a portion (about 40% of the total of all administration projects are included because the overhead in these projects is included in the Utility and Watershed projects (12, 26, 61, and 63) • Equipment renewal costs are included in the 100-year model as maintenance renewals (i.e., as shown above for Fleet & Equipment), and may not match District budgeted amounts

Asset Category	Cost Assumption
Capital	• Project costs are not inflated/discounted • Entire Current CIP is included • ISMP Projects - not included at this time. Priority and timeline are unknown. • BDCP is not included as a capital project at this time. Investment has not been approved by board. It may be partially included in operations budget projections. • San Luis Reservoir Low Point Improvement Project is partially included. The local solution included operations investments, which are not included (not infrastructure); a pond, which is included as part of WSIMP; and wells. The wells are not included, but can be added in the future • Salt and Nutrient Mgmt Plan recommendations are not finalized and not likely to have any infrastructure improvements • IRWM is a regional plan compiling projects from other District master plans. As such, any projects in the IRWM are already accounted for in this plan. • HCP projects have not been finalized and details are pending the issuance of the incidental take permit. Approximate future CIP costs have been included under one project: TC HCP Implementation • Safe Clean Water infrastructure projects included as capital projects: Projects A1, A3, C1, D4, D6, D7, D8, E4, E5, E6, E7, E8 (Subset included in SCW Implementation Fund Project: D4, D6, D7,) • Safe Clean Water grants/operational projects are not included as capital projects, but are included as O&M costs: A2, B2, B3, B4, B5, B6, B7, C2, D3, D5, E1, E2, E3, • B1, D1, D2 are included but are not related to a specific asset. Two are ecological asset projects • Facilities master plan included as two unfunded capital projects (fleet & facility annex, maintenance office upgrade/replacement), and in annual small caps budget • Unfunded Capital projects: Some are included as master plan projects, some are included in the asset management funding model, some are excluded for specific reason (LPIP), some are included as a specific unfunded project • WSIMP indirect potable re-use project is included as the unfunded 'recycled water full scale implementation' project Utility/Administration: • O&M costs for new constructed assets are included, or increase in O&M due to asset improvement project. If O&M is expected to stay about the same or decrease (i.e., for rehab of existing asset), O&M was not added Watersheds: • No new 'assets' - all improvements to existing creeks. As such, O&M for new capital is not included separately. O&M is captured in AMP financial projection for each creek in its optimized management strategy

Table 2. Almaden Campus Buildings Replacement Costs

Building	Cost ($/Sq. Ft.)	Size (sq. ft.)	Total Replacement Cost
Headquarters Building	400	98,274	$39,309,600
Administration Building	350	41,294	$14,452,900
Crest Building	300	25,556	$7,666,800
Maintenance Offices Building	300	13,676	$4,102,800
Administration Annex Warehouse (Facilities Warehouse)	225	4,850	$1,091,250
Maintenance Shops	275	17,135	$4,712,125
Maintenance Annex (Ready Room)	225	4,800	$1,080,000
Blossom Hill Annex Building	400	15,470	$6,188,000
Water Quality Laboratory	400	23,046	$9,218,400
Vegetation Management Facility	225	16,461	$3,703,725
Winfield Warehouse	225	39,925	$8,983,125

Table-3: Land Costs

Land Category	Cost ($/sq. ft.)
Agricultural/Intensive/Non-Orchard/Field Crops/Timber	0.24
Agricultural/Pasture/Grazing/Range Land	0.06
Churches	16.33
Commercial Open Space Uses/Public Parking Lots	16.33
Condo/Townhouse	23.00
Exempt	15.00
Extractive Land Use: Quarries/Oil/Gas/Other	16.33
Five Or More Family > 100 Units	65.00
Forest & Brush Lands/Scenic	0.29
General Industrial Non-manufacturing Or Manufacturing/Non-manufacturing	54.64
Misc Industrial Non-manufacturing & Heavy Commercial	16.50
Non-profit Open Spaces	10.00
Null	10.00
Office Uses-General Office; High rise	54.64
Other Public Open Space Uses	10.00
PO Exempt	10.00
Public Warehousing	54.64
Reservoirs: Water Supply And Flood Control Lands	10.00
Retail Uses-Auto Service/Garages	100.00
Retail Uses-Individual Retail Store; Converted to Retail Use	100.00
Single Family, Two Family	72.85
Utilities & Communications	8.25
Vacant Urban	16.50
Vacant Urban-Potential 2-4 Unit Multiple Use; Potential Commercial Use	54.64
Vacant Urban-Potential High Density Residential Use	23.00
Vacant Urban-Potential Office Use; Potential SF Use	54.64

APPENDIX THREE – CLASS STRUCTURE

ADMIN

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
ADMIN		
	COMMUNICATION	
		MODEM
		PHONE
		PUBLIC PAY PHONE
		RADIO
		ROUTER
		SWITCH
		TERMINATION BOARD
ADMIN		
	COMPUTER	
		LAPTOP
		MONITOR
		PC WORK STATION
		PROGRAMMABLE LOGIC CONTROLLER
		SERVER
ADMIN		
	FURNITURE	
		CABINET
		CHAIR
		DESK
		MODULAR
		SHELF
		TABLE
ADMIN		
	OFFICE EQUIPMENT	
		COPIER
		FAX
		PRINTER
ADMIN		
	SECURIT /ACCESS CONTROL	
		CARD READER
		INTRUSION SWITCH
		VIDEO CAMERA
ADMIN		
	SOFTWARE	
		ENTERPRISE
		NETWORK
		OFFICE
		SUPERVISORY CONTROL AND DATA ACQUISITION
		WORKGROUP

CIVIL

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
CIVIL		
	BUILDING	
		BLOCK HOUSE
		CONSTRUCTED
		FLOOR
		PORTABLE
		PREFABRICATED
		ROOF
CIVIL		
	CATHODIC PROTECTION	
		ANODE
		CP RECTIFIER
		TEST STATION
CIVIL		
	CRANE	
		BOOM
		BRIDGE
		MONORAIL
CIVIL		
	LAND IMPROVEMENTS	
		BENCH
		DRAINAGE
		FENCE
		GATE
		LANDSCAPE
		PARKING LOT
		ROAD
		SIDEWALK
		SIGN
		STAIRS
		STORM DRAIN
		TRAIL
CIVIL		
	PIPE	
		ABS
		CAST IRON
		CONCRETE CYLINDER
		COPPER
		CORRUGATED METAL
		CPVC
		DUCTILE IRON
		FIBERGLASS REINFORCED PLASTIC
		HDPE
		PRESTRESSED CONCRETE CYLINDER
		PVC
		REINFORCED CONCRETE
		STAINLESS STEEL
		VITRIFIED CLAY
		WELDED STEEL
CIVIL		
	STRUCTURE	
		AWNING
		BASIN
		BRIDGE
		CATWALK
		CHANNEL
		CULVERT
		DAM
		DRAINAGE
		FISH SCREEN
		FISH STRUCTURE
		FLOOD WALL
		FLUME
		INTAKE
		LEVEE
		MAINTENANCE RAMP
		OUTFALL
		POND
		RADIO TOWER
		RESERVOIR
		RETAINING WALL
		SPILL CONTAINMENT
		SPILLWAY
		SURVEY MONUMENT
		TRASH RACK
		TUNNEL
		VAULT
		WEIR
		WELL

CIVIL, Continued

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
CIVIL		
	STRUCTURE APPURTENANCE	
		ARCHITECTURAL FEATURE
		DOOR
		ELEVATOR
		EYEWASH/SHOWER
		FILTER CONE
		FILTER MEDIA
		FIRE DOOR
		FIRE EXTINGUISHER
		FIRE PULL STATION
		FIRST AID KIT
		HATCH
		LARGE KITCHEN APPLIANCE
		LOCKERS
		LOG BOOM
		PORTABLE APPLIANCE
		PROJECTOR SCREEN
		RESTROOM FIXTURE
		ROLLUP DOOR
		SAMPLE STATION
		SELF CONTAINED BREATHING APPARAT
		SMOKE CURTAIN
		SOUND ATTENUATOR
		TRASH DUMPSTER
		WINDOW
CIVIL		
	TANK	
		CHEMICAL
		FUEL
		PRESSURE VESSEL
		WATER

ELECTRICAL

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
ELECTRICAL		
	ADJUSTABLE SPEED DRIVE	
		ALTERNATING CURRENT
		DIRECT CURRENT
ELECTRICAL		
	BREAKER	
		AIR
		GAS
		VACUUM
ELECTRICAL		
	BUSWAY	
		OUTDOOR
ELECTRICAL		
	CAPACITOR BANK	
ELECTRICAL		
	CONDUCTOR	
		LOW VOLTAGE
		MEDIUM VOLTAGE
ELECTRICAL		
	DISINFECTION EQUIPMENT	
		OZONE GENERATOR
US		UV BULB
		UV BULB SLEEVE
		UV REACTOR
ELECTRICAL		
	GENERATOR	
ELECTRICAL		
	LINE REACTOR	
		CAPACITIVE
		INDUCTIVE
ELECTRICAL		
	MOTOR	
		ALTERNATING CURRENT
		DIRECT CURRENT
ELECTRICAL		
	MOTOR CONTROL CENTER	
		LOW VOLTAGE
		MEDIUM VOLTAGE
ELECTRICAL		
	MOTOR CONTROLLER	
		ALTERNATING CURRENT
		DIRECT CURRENT
ELECTRICAL		
	MOTOR STARTER	
		SOFT START
ELECTRICAL		
	PANELBOARD	
		DISTRIBUTION
		LIGHTING
ELECTRICAL		
	POWER METER	
		ELECTRO MECHANICAL
		ELECTRONIC
ELECTRICAL		
	POWER MONITOR	
		LOW VOLTAGE
		MEDIUM VOLTAGE
ELECTRICAL		
	POWER SUPPL	
		ALTERNATING CURRENT
		BALLAST
		BATTERY BANK
		BATTERY CHARGER
		DIRECT CURRENT
		UNINTERUPTIBLE POWER SUPPL
ELECTRICAL		
	RELAY	
		ELECTRO MECHANICAL
		SOLID STATE
ELECTRICAL		
	RESISTOR BANK	
ELECTRICAL		
	SITE SERVICE	
		EMERGENCY LIGHTING
		GENERATOR HOOK UP
		LIGHTING
		LIGHT POLE
		SERVICE PEDESTAL
		SOLAR PANELS

ELECTRICAL, Continued

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
ELECTRICAL		
	SPACE HEATER	
ELECTRICAL		
	SURGE ARRESTOR	
		DISTRIBUTION
		STATION
ELECTRICAL		
	SWITCH	
		AUTOMATIC TRANSFER
		INTERRUPTER
		MANUAL
ELECTRICAL		
	SWITCHGEAR	
		SWITCHBOARD
ELECTRICAL		
	TRANSFORMER	
		CURRENT
		DISTRIBUTION
		POTENTIAL
		POWER

FLEET

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
FLEET		
	HEAV EQUIPMENT	
		TRACKED
		WHEELED
FLEET		
	OTHER EQUIPMENT	
		AERIAL LIFT
		BOAT
		HYDRAULIC LIFT
		TRAILER
		SCISSOR LIFT
FLEET		
	OTHER VEHICLE	
		BUS
		ELECTRIC CART
		FORK LIFT
FLEET		
	PASSENGER VEHICLE	
		SUB-COMPACT
		COMPACT
		MID-SIZE
		LARGE
		STATION WAGON
		PASSENGER VAN
		SUV
FLEET		
	TRUCKS	
		HEAV DUT TRUCK
		LIGHT DUT 4X2
		LIGHT DUT 4X4
		MEDIUM DUT (<26K GVWR

INSTRUMENTATION

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
INSTRUMENTATION		
	ANALYZER	
		ALKALINITY
		AMBIENT OXYGEN
		AMBIENT OZONE
		AMMONIA
		AUTOMATIC SAMPLER
		CARBON MONOXIDE
		CHART RECORDER
		CHLORINE
		CONDUCTIVITY
		CONFINED SPACE
		DEW POINT
		DISSOLVED OXYGEN
		DISSOLVED SULFIDE
		OXIDATION REDUCTION POTENTIAL
		OXYGEN
		OZONE
		PARTICLE COUNTER
		Ph/TEMPERATURE
		POTASSIUM PERMANGANATE
		SMOKE DETECTOR
		STREAMING CURRENT
		TOTAL ORGANIC CARBON
		TRANSMITTANCE
		TURBIDIMETER
INSTRUMENTATION		
	COMMUNICATION CABLE	
		FIBER OPTIC
		METALLIC
INSTRUMENTATION		
	CONTROL PANEL	
		ALARM
		FIRE ALARM
		HEATING VENTILLATION AIR CONDITIONING
		INPUT OUTPUT CABINET
		LOCAL CONTROL PANEL
		PROGRAMMABLE LOGIC CONTROLLER CABINET
		REMOTE TELEMETRY UNIT
INSTRUMENTATION		
	FLOW METER	
		CALIBRATION COLUMN
		DIFFERENTIAL PRESSURE
		MAGNETIC
		MASS
		OPEN CHANNEL
		ORIFICE PLATE
		PROPELLER
		ROTAMETER
		SENSOR
		THERMAL MASS
		TOTALIZER
		TURBINE
		ULTRASONIC
		WEIR
INSTRUMENTATION		
	INCLINOMETER	
		SINGLE AXIS
		2 AXIS DIGITAL
INSTRUMENTATION		
	LEAK DETECTOR	
INSTRUMENTATION		
	LEVEL INSTRUMENT	
		BUBBLER
		CAPACITANCE
		CONDUCTIVITY
		DIFFERENTIAL PRESSURE
		FLOAT
		GUIDED RADAR
		MAGNETIC
		STAFF
		STREAM GAUGE
		SWITCH
		ULTRASONIC
INSTRUMENTATION		
	POSITION INSTRUMENT	
		ELECTRONIC CONTROLLER
		LIMIT SWITCH
		MAGNETIC
		OPTICAL
		RESISTIVE

INSTRUMENTATION, Continued

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
INSTRUMENTATION		
	PRESSURE INSTRUMENT	
		DIFFERENTIAL PRESSURE
		MECHANICAL
		PIEZOMETER
		SWITCH
		TRANSDUCER
INSTRUMENTATION		
	SEISMOGRAPH	
INSTRUMENTATION		
	SIGNAL TRANSMITTER	
		ANALOG
		DIGITAL
		RADIO
INSTRUMENTATION		
	TEMPERATURE INSTRUMENT	
		BIMETAL
		RESISTANCE
		SEMICONDUCTOR
		SWITCH
		THERMISTOR
		THERMOCOUPLE
		THERMOMETER

MECHANICAL

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
MECHANICAL		
	BLOWER	
		CENTRIFUGAL
		POSITIVE DISPLACEMENT
MECHANICAL		
	COMPRESSOR	
		RECIPROCATING
		ROTARY
MECHANICAL		
	CONDENSER	
		FAN COOLED
		WATER COOLED
MECHANICAL		
	CONVEYOR	
		AUGER
		BELT
		CHAIN
		FLIGHT
		RAKE ARM
		SPROCKET
MECHANICAL		
	DEWATERING EQUIPMENT	
		BELT FILTER PRESS
		CENTRIFUGE
MECHANICAL		
	ENGINE	
		ALTERNATIVE FUEL
		DIESEL
		GAS
MECHANICAL		
	EVAPORATOR	
		OXYGEN
MECHANICAL		
	FILTER/STRAINER	
		AUTOMATIC
		BASKET
		CARTRIDGE
		DESSICANT DRYER
		DUST COLLECTOR
		MF MEMBRANE
		OZONE DESTRUCTOR
		RO MEMBRANE
		WATER SOFTENER
		Y STRAINER
MECHANICAL		
	HVAC	
		AIR HANDLER
		BOILER
		CHILLER
		COOLING TOWER
		DAMPER/LOUVER
		DRINKING FOUNTAIN
		DUCT
		EXHAUST HOOD
		FAN
		HEAT EXCHANGER
		HEATER
		ICE MACHINE
		PACKAGE AC UNIT
		REFRIGERATOR
		REFRIGERATED AIR DRYER
		WATER HEATER
		FREEZER
MECHANICAL		
	MECHANICAL DRIVE	
		BELT
		GATE OPENER
		GEAR
MECHANICAL		
	MIXER	
		PROPELLER
		PUMP
		STATIC
		VIBRATOR
MECHANICAL		
	NOZZLE	
		INJECTION
		MONITOR
MECHANICAL		
	PUMP	
		CENTRIFUGAL
		POSITIVE DISPLACEMENT

MECHANICAL, continued

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
MECHANICAL		
	TURBINE	
		IMPULSE
		REACTION
MECHANICAL		
	VALVE	
		AIR/VACUUM RELEASE
		BACKFLOW DEVICE
		BALL
		BUTTERFL
		CHECK
		CONE
		DIAPHRAGM
		FAUCET
		FIRE CONTROL
		FIRE HYDRANT
		GATE
		GLOBE
		PLUG
		PRESSURE REGULATING
		PRESSURE RELIEF
		RADIAL GATE
		SLEEVE
		SLIDE GATE
		TELESCOPING
MECHANICAL		
	VALVE ACTUATOR	
		ELECTRIC
		HYDRAULIC
		MANUAL
		PNEUMATIC

INTANGIBLE

LEVEL 1 CLASS	LEVEL 2 SUBCLASS	LEVEL 3 TYPE
INTANGIBLE ASSET		
	LICENSES/PERMITS	
INTANGIBLE ASSET		
	NATURAL RESOURCE EXTRACTION RIGHTS	
INTANGIBLE ASSET		
	OTHER INTANGIBLE ASSETS	
INTANGIBLE ASSET		
	PATENTS	
INTANGIBLE ASSET		
	RIGHTS OF WAY/EASEMENTS	
INTANGIBLE ASSET		
	WEB SITES	

APPENDIX FOUR – ESTABLISHED CREEK LEVELS OF SERVICE

Santa Clara Valley Water District

WATERWAY EXISTING LEVEL OF SERVICE

DOCUMENT NO.: [DOCUMENT ID]
REVISION: DRAFT
EFFECTIVE DATE:
PROCESS OWNER: R. Narsim

Page 1 of 2

This document records the **Existing Level of Service** for a reach of waterway based on the sources cited as approved below:

Watershed	**Guadalupe**	**Waterway**	**Canoas**
Reach	**Guadalupe River to Cottle Rd.**	**Improved?**	**Y**

Existing Level of Service by Category:

<table>
<tr><td>1. Flow Conveyance</td><td>1.1 The existing Level of Service flow rates in Canoas Creek are shown in the table below:-
<table>
<tr><th>Location</th><th>Creek Sta</th><th>Flow (cfs)</th></tr>
<tr><td>Nightingale Dr</td><td>14+00</td><td>1,600</td></tr>
<tr><td>Hillsdale Ave</td><td>85+00</td><td>1,572</td></tr>
<tr><td>Branham Ln</td><td>152+00</td><td>1,540</td></tr>
<tr><td>Blossom Hill Rd</td><td>214+00</td><td>1,307</td></tr>
<tr><td>Calero Ave</td><td>244+50</td><td>841</td></tr>
<tr><td>Cottle Rd</td><td>390+00</td><td>621</td></tr>
</table>
1.2 Maintain Cross Sections from original construction as-built documents. These contain standard Cross Sections and plans and profiles for the entire length of creek from Cottle Road to Almaden Expressway.

1.3 Maintain streamflow gaging system functional integrity upstream of the confluence with Guadalupe River (Station 73, Alert ID. 1485)</td></tr>
<tr><td>Source</td><td>1.1 Design Calculations for Zone C-1 (Central) Project No.30011, Canoas Creek from Nightingale Drive to Cottle Road, 1963. The design flows of from 600 cfs to 1600 cfs were given in the 1960 Engineers Report (p.16).

1.2 As-Built Drawings: Canoas Creek Diversion from Almaden Rd. to Canoas Cr. (Exist), 1960; Zone C-1, Canoas Creek Improvement from Almaden Rd. to Cottle Avenue, 1971; Maintenance Measures on Canoas Creek from Almaden Expressway to Nightingale Drive. 11/22/1976

1.3 Board Ends Policy 2.2: “There is reduced potential for flood damages.”</td></tr>
</table>

2. Ecological Functions	2.1 Mitigate for any maintenance work, per SMP

Source(s)	2.1 Stream Maintenance Program, (Final EIR: August 2001)

3 Structural Integrity	3.1 Maintain Channel and appurtenant facilities as designed and constructed.
Source(s)	3.1 As-Built drawings previously referenced:

4 Water Supply	N/A
Source(s)	There are no active water supply functions

5 Recreation	N/A
Source(s)	There are no recreational facilities or agreements

Approvals:

Marc Klemencic Chief Operating Officer Watersheds	Jim Fiedler Chief Operating Officer Water Utility

This document records the **Established Level of Service** for a reach of waterway based on the sources cited as approved below:

Watershed	**Guadalupe**	**Waterway**	**Guadalupe River and Guad Creek**
Reach		**Constructed?**	**Yes**

Established Level of Service by Category:

1. Board Ends Policy E-3, Natural Flood Protection:	***Conveyance*** 1.1 Guadalupe Creek Meridian Ave to Almaden Expy 3800 cfs (HEC-RAS) 1.2 At Almaden Expy downstream of Alamitos and Guadalupe Creek Confluence 1200 cfs (HEC-RAS) 1.3 I280 to Los Gatos Creek Confluence 14600 cfs 1.4 D/S Los Gatos Creek Confluence to Airport Parkway 17000 cfs 1.5 D/S Airport Parkway to Tasman 17312 to 18325 cfs by subreaches 1.6 Tasman to SFBay 18325 cfs Values from 100 year US Army Corp of Engineers Design Flow conveyance values for Upper Guad River are to be determined in the future as part of the Upper Guad Project. ***Stability*** Structural stability of levees as required Board Ends Policy 3.2, Objective 3.2.1 Levee should be stable for passage of the design flow *Additional requirements:* Bank stability: stable ground cover along 75 percent of the affected stream length Channel Bed Stability: Maintain channel bed elevation within 0.5 feet of previous survey Instream cover: 10 percent of total stream area at depths greater than 15 cm at normal summer flow Shaded stream surface: 45 percent of total stream surface area shaded at normal summer flow, at least 85 percent of bank with some shade Nonnative species: cover by giant reed should be <5 percent; cover by other nonnative

	woody species should be <15 percent
Source(s)	For Items 1.1 and 1.2 - HEC RAS; For Items 1.3 to 1.6 US COE Designs

Level of Service Owner: ____
[Name]
[Title]

2. Board Ends Policy E-2, Reliable Water Supply	At SF 23B, maintain average minimum flow of 2.5 cfs, with an instantaneous minimum flow of 1 cfs (CDFG Streambed Alteration Agreement)
Source(s)	CDFG Streambed Alteration Agreement, Notification Number 1600-2009-0409-R3

Level of Service Owner: ______________________________________
[Name]
[Title]

3. Board Ends Policy E-4, Healthy Creek Ecosystems	Specific operational parameters apply to maintain water in creek for critical fish habitat functions at critical times of year. Certain requirements are specified in Chapter 4 in Vol 2, Appendix of the FINAL INTEGRATED GENERAL RE-EVALUATION REPORT/ ENVIRONMENTAL IMPACT REPORT-SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT. These are revisited with the Adaptive Management Team and are to be revised annually. However, the GRR (report) does not define what bankfull flows are and the regimen of bankfull flows that control the movement of stream bed gravel and channel stability, even though its objective is to maintain habitat and channel stability. The "low flow" is not defined in terms of flow and cannot be equated to bankfull flow. These are to be defined through the AMT to insure efficient and economic methods to satisfy the objectives of Chapter 4 in Vol 2.

Fish Passage

Vertical barriers: Vertical barriers must allow upstream migration of anadromous fish

> Vertical Barriers: At any vertical barrier greater than 0.5 feet, the minimum staging pool depth must be 2 feet or 1.25 times the height of the barrier, whichever is greater. The height and length dimensions may not exceed the leaping abilities for steelhead or Chinook salmon.
>
> Depth & Velocity Barriers: Low flow channel should maintain a minimum 1.0 ft depth and maximum 5 ft/s velocity for range of flows ≥ 4 cfs to those retained within the constructed low flow channels.

Additional LOS set relative to pre-project levels:

Spawning gravel abundance: spawning gravel abundance greater than or equal to preproject levels

Spawning gravel quality: spawning gravel quality greater than or equal to preproject levels

Adult Migration and Spawning: anadromous fish migration and spawning consistent with preproject levels and environmental conditions not affected by the Guadalupe River Project

Juvenile rearing: steelhead rearing distribution and abundance consistent with preproject levels and environmental conditions not affected by the Guadalupe River Project

Juvenile migration: anadromous fish outmigration timing and abundance consistent with preproject levels and environmental conditions not affected by the Guadalupe River Project

Monthly thermal suitability: monthly thermal suitability units for steelhead and chinook salmon equal to or greater than preproject levels

Short-term thermal suitability: monthly median hourly water temperature must provide a suitability index for steelhead and chinook salmon life stages greater than 0.5 in at least 50 percent of the Project area

Source(s)

General Re-evaluation Report (GRR), EIR 2001 – Chapter 4, Vol 2, Appendix;
Items specified in the GRR are to be refined through discussions based on findings and lessons learned in subsequent meetings with the AMT.

Level of Service Owner: ___________________________________
[Name]
[Title]

Approvals:

Asset Owners:

Norma Camacho Chief Operating Officer Watersheds	Jim Fiedler Chief Operating Officer Water Utility

CHANGE HISTORY		
DATE	**REVISION**	**COMMENTS**
9/10	Draft	For Review

Santa Clara Valley Water District	WATERWAY ESTABLISHED LEVEL OF SERVICE	DOCUMENT NO.: WFXXXXX REVISION: DRAFT EFFECTIVE DATE: PROCESS OWNER: R. Narsim Page 1 of 2

This document records the **Established Level of Service** for a reach of waterway based on the sources cited as approved below:

Watershed	**Lower Peninsula**	**Waterway**	**Stevens**
Reach		**Constructed?**	**Yes**

Established Level of Service by Category:

1. Board Ends Policy E-3, Natural Flood Protection:	LOCATION	FLOW RATE (cfs)
	Homestead Road	5,700
	Upstream Permanente Diversion	6,140
	Downstream Permanente Diversion	7,320
	At El Camino Real	7,230
	At Highway 101	7,340
Source(s)	SCVWD; Stevens Creek Planning Study, Engineer’s Report, June 1980	

2. Board Ends Policy E-2, Reliable Water Supply	
Source(s)	

3. Board Ends Policy E-4, Healthy Creek Ecosystems	
Source(s)	

Approvals:

Marc Klemencic
Chief Operating Officer
Watersheds

Jim Fiedler
Chief Operating Officer
Water Utility

CHANGE HISTORY		
DATE	**REVISION**	**COMMENTS**
6/09	Draft	For Review

Santa Clara Valley Water District	WATERWAY EXISTING LEVEL OF SERVICE	DOCUMENT NO.: WWXXXX REVISION: DRAFT 2 EFFECTIVE DATE: 10/01/09 PROCESS OWNER: R. Narsim
		Page 1 of 2

This document records the **Existing Level of Service** for a reach of waterway based on the sources cited as approved below:

Watershed	**Coyote**	**Waterway**	**Upper Penitencia**
Reach	**Coyote Ck. Confluence to Dorel Dr.**		

Existing Level of Service by Category:

1. Flow Conveyance	At Dorel: 3,600 cfs At Upper Penitencia Rd: 2,950 cfs At Capitol Avenue: 1,350 cfs At Maybury Avenue: 1,050 cfs Note: Rate reduction due to capacity restrictions
Source(s)	FEMA Flood Insurance Study – 1998 Revision, dated August 17, 1998.

2. Ecological Functions	2.1 Water Diversions must be Fish Passable with “sufficient flow through fish ladders” (during up- and down-stream migratory period, Sept. 16 – May 31) and Screened to prevent diversion of fish. 2.2 Mitigate for any maintenance work, per SMP
Source(s)	2.1 April 1997 Memorandum of Understanding Agreement with California Department of Fish and Game, Appendix A. 2.2 Stream Maintenance Program, most recent version (2005)

3 Structural Integrity	3.1 Maintain function of fish ladders 3.2 Maintain water diversion structures 3.3 Erosion prevention for protection of non-district assets (road, bridges, etc.) 3.4 Maintain integrity and accuracy of up to two streamflow and one temperature gaging stations at Dorel Dr. SF# 83 (Alert ID #1548), and Piedmont Rd. SF # 1 (Alert ID # 1489) and Mabury Rd temperature # 88, (Alert ID # 1499).
Source(s)	3.1 As-Built Drawings for Fish Ladders at Mabury Road and Noble Avenue (2/24/2000) 3.2 As-Built Drawings for diversion structures. 3.3 Maintenance Guidelines. 3.4 As Built Drawings for stream gages.

4 Water Supply	4.1 Maintain water rights for diversion of 2,230 acre-feet per year
Source(s)	4.1 Appropriative Water Rights Permit No. 006565, dated July 29 1946 from State Water Resources Control Board

5 Recreation	5.1 In constructing any flood control improvements, District shall be guided by the principles of the 1977 Penitencia Creek Park Master Plan, and minimize disturbance to the natural channel, as well as constructing "aesthetically pleasing flood control improvements on District property. 5.2 Trash removal within 5 days of notification to district
Source(s)	5.1 Tri-Party Agreement, p.4 of 7, (District, San Jose, Santa Clara County) dated March 20, 2007 5.2 CSC Good Neighbor Maintenance, 2000

QUALITY RECORDS

None

CHANGE HISTORY

DATE	REVISION	COMMENTS

ADDENDA

None

APPROVALS:

Marc Klemencic
Chief Operating Officer
Watersheds

Jim Fiedler
Chief Operating Officer
Water Utility

Santa Clara Valley Water District	WATERWAY ESTABLISHED LEVEL OF SERVICE	DOCUMENT NO.: WFXXXXX REVISION: DRAFT EFFECTIVE DATE: PROCESS OWNER: R. Narsim Page 1 of 2

This document records the **Established Level of Service** for a reach of waterway based on the sources cited as approved below:

Watershed	**Uvas/Llagas**	**Waterway**	**Uvas Creek**
Reach		**Improved?**	**Y N**

Established Level of Service by Category:

1. Flow Conveyance	1.1 Confluence with Pajaro River to Southern Pacific Railroad (UPRR) – 5,200 cfs (spill) 1.2 Southern Pacific Railroad to U.S. Hwy 101 – 8,000 cfs (spill) 1.3 U.S. Hwy 101 to Thomas Rd. – 10,700 cfs (spill) 1.4 Thomas Rd. to Santa Teresa Blvd. – 14,000 (contained by levee) 1.5 Santa Teresa Blvd. to Uvas Reservoir – 13,550 cfs
Source(s)	1.1 – 1.3 and 1.5 FEMA FIS, 1998. FIRM Panels 060340 0001, 0003, 0004. 1.4 (Corps levee project); 2009 FEMA Certification Package (PAL, or Provisionally Accredited Levee)

2. Ecological Functions	Specific operational parameters apply to maintain water in creek for critical fish habitat functions at critical times of year.
Source(s)	1956 MOU with DFG DFG CODE 5937 -- Per Don Arnold. Haven't found this yet,

3. Structural Integrity	Maintain channel cross sections and levees per As-Built Drawings
Source(s)	As-Built Construction drawings for Uvas Creek Levee "Uvas Creek Levee at Gilroy, Levee Improvement and Construction Plan," dated 9/13/89 U.S Army Corps of Engineers, Sacramento Division

4. Water Supply	Diversion (to Uvas Reservoir) of 10,000 acre-feet from 11/1 – 5/1 and 14,000 acre-feet from 2/1 – 7/31
Source(s)	Water Rights License No. 6422, dated 1950

5. Recreation	City of Gilroy operates levee trail per agreement with SCVWD.
Source(s)	Joint Use Agreement with City of Gilroy, dated May 16, 2005. City of Gilroy Sports Park Phases I & II Drawings 8/30/04

Approvals:

Marc Klemencic
Chief Operating Officer
Watersheds

Jim Fiedler
Chief Operating Officer
Water Utility

CHANGE HISTORY

DATE	REVISION	COMMENTS
6/09	Draft	For Review

APPENDIX FIVE – PROJECT LISTS

Table 1. Operation & Maintenance Projects

Project Name	Project Number
Water Utility	
IW San Felipe Division Delvrs	91131006
IW South Bay Aqueduct Delvrs	91131007
State Water Project Costs	91131008
San Felipe Reach 1 Operation	91211004
San Felipe Reach 1 Gen Maint	91211099
San Felipe Reach 2 Operation	91221002
San Felipe Reach 2 Gen Maint	91221099
San Felipe Reach 3 Operation	91231002
San Felipe Reach 3 Gen Maint	91231099
SVAWPC Facility Operations	91281007
SVAWPC Facility Maintenance	91281008
Well Ordinance Program	91451002
Local Reservoir/Diversion Ops	91761002
Dams / Reservoir Gen Maint	91761099
Domestic Well Testing Program	91792001
Vasona Pump Station Gen Main	92261099
Raw Water T and D Genrl Oper	92761001
Recycled Water T&D Genrl Maint	92761008
Recharge/RW Field Ops	92761009
Rchrg / RW Field Fac Maint	92761010
Untreated Water Field Operations	92761011
Anderson Hydrelctrc Fclty Main	92761085
Raw Water T / D Gen Maint	92761099
RW Corrosion Control	92781002
PWTP General Operations	93231009
Penitencia WTP General Maint	93231099
STWTP - General Operations	93281005
Santa Teresa WTP General Maint	93281099
RWTP General Operations	93291012
Rinconada WTP General Maint	93291099
Water District Laboratory	93401002
SF/SCVWD Intertie General Ops	93761001
Campbell Well Field Operations	93761004
Campbell Well Field Maintenance	93761005
SF/SCVWD Intertie Gen Maint	93761099
Treated Water T/D Gen Maint	94761099
SCADA Systems Upgrades	94762007
Treated Water T/D Corrosion	94781001
WUE Spare Part Inventory Mgmt	95062044
Welding Services	95071041
Water Use Measurement	95111003

Project Name	Project Number
SCADA Network Administration	95761003
HAZMAT Emergency Response	95771031
Watersheds	
LP/WV/Guad Fac Condition Assmnt	20081008
LP/WV/Guad Gen Field Maint	20761011
LP/WV/Guad Debris Removal	20761021
LP/WV/Guad Erosion Protection	20761041
LP/WV/Guad Wtrshd Gd Neighbor	20771022
LP/WV/Guad Sediment Removal	20771052
LP/WV/Guad Levee Maintenance	20811011
Coy/Pajaro Facilities Condition Assmt	40081008
Coy/Pajaro General Field Maint	40761011
Coy/Pajaro Wtrshd Debris Rmvl	40761021
Coy/Pajaro Wtrshd Erosion Protection	40761041
Coy/Pajaro Wtrshd Gd Neighbor	40771024
Coy/Pajaro Wtrshd Sediment Rmvl	40771054
Coy/Pajaro Wtrshd Levee Maint	40811011
Pond A4 Operations	62761009
Watersheds Tree Maintenance	62761010
Watershed Good Neighbor Maint	62761022
Watershed Sediment Removal	62761023
Watrshd Facility Condition Assessment	62761024
Watershed General Field Maint	62761025
Watershed Debris Removal	62761026
Watershed Erosion Protection	62761027
Watershed Levee Maintenenace	62761028
Vegetation Management for Access	62761078
LwrGuad Veg Mgmt for Fld Conveyance	62762073
Channel Bed and Bank Improvement for Fisheries D4.2	26002270
Fish Passage Improvements	26002290
Guad R Invasiv Exotic Veg Remv	26072044
Watershed Good Neighbor Maint	26761022
Watershed Sediment Removal	26761023
Mgmt of Revegetation Projects	26761075
Revitalize Riparian, Upland, & Wetland Habitat	26761076
Vegetation Management for Access	26761078
LP/WV/Guad Wtrshd Gd Neighbor	26771022
Coy/Pajaro Wtrshd Gd Neighbor	26771024
LP/WV/Guad Sediment Removal	26771052
Coy/Pajaro Wtrshd Sediment Rmvl	26771054
Stream Capacity Vegetation Con	26771067
Pollution Prvtn Partnerships & Grants	26061006
Grants to Rest Habitat Access to Trails	26061007

Project Name	Project Number
Water Conservation Grants	26061008
Nitrate Treatment System Rebate	26061010
Cleanup Efforts and Education	26061011
Supp Volunteer Cleanup Eff&Ed	26061078
Hydration Station Grants	26062009
Surface Water Qlty Imprvment Pl	26752043
InterAgency Urban Runoff Program	26771011
Illegal Encampment Cleanup Program	26771027
HAZMAT Emergency Response	26771031
HAZMAT Emergency Response	62771031
Welding Services	62071041
Administration	
Class I Equip Oper / Maint	70011099
Class II Equip Oper / Maint	70021099
Class III Equip Oper / Maint	70031099
Class IV Equip Oper / Maint	70041099
Telecommunications Sys Opr/M	60101006
Software Maint & License	60161001
Internet/Intranet Maintenance	60161003
Data Center Operations	60191001
District HVAC Services	60201001
GIS Maintenance & Support	60271010
Computerized Maint Mgmt Syst	60271011
ERP System Maint & Support	60271060
Welding Services	60071041

Table 2. Planning & Engineering Projects

Project Name	Project Number
Water Utility	
Water Operations Planning	91041012
Urban Water Management Plan	91041014
Groundwater Management Program	91041018
Facilities Env Compliance	91061012
Dam Safety Program	91081007
Recycled Water Program	91101004
Water Rights	91111001
Imported Water Program	91131004
Water Conservation Program	91151001
Water Conservation-Residential	91151007
Water Conservation-Commercial/Ind	91151008
Water Conservation-AG	91151009
Water Conservation-Landscape	91151010

Project Name	Project Number
Water Conservation Campaign	91151011
San Felipe Reach1 Ctrl and Ele	91211084
SF Reach 1-Engineering - Other	91211085
SF Reach 2-Engineering - Other	91221006
San Felipe Reach3 Ctrl and Ele	91231084
SF Reach 3-Engineering - Other	91231085
Desalination	91441003
Source Water Quality Mgmt	91451005
Invasive Mussel Prevention	91451011
Salt and Nutrient Mgmt Plan	91452042
Groundwater Monitoring	91551001
Groundwater Supply Managemen	91551002
Local Res / Div Plan & Analysis	91761001
Groundwater Quality Management	91791012
FAHCE/Three Creeks HCP Project	92041014
Facilities Env Compliance	92061012
Rchrg / RW Field Fac Asset Mgt	92761006
Rchrg / RW Field Ops Plan& Analysis	92761007
Untreated Water Prog Plan&Analysis	92761012
Raw Water T&D Ctrl and Electr	92761082
Raw Water T&D Eng Other	92761083
Facilities Env Compliance	93061012
W T General Water Quality	93081008
Water Treatment Plant Engineering	93081009
PWTP Landslide Monitoring	93231007
Treated Water Ctrl & Elec Eng	93761006
TW T&D - Engineering - Other	94761005
WU Asset Protection Support	95011003
Electrical Power Support	95021008
Pipeline Monumentation	95021009
Integrated Regional Water Mgmt	95041039
WUE Asset Management Plng Prgm	95061007
WUE ER Response Plan & Implement	95061043
AM Framework Implementation	95061045
District CMMS Administration	95061046
Safe Clean Water Implementation	95061054
WUE Maint Audit Impl Plan	95062012
Water Supply Modeling/Analys	95731001
WUE Long-term Planning	95741001
Water Resources EnvPlng & Permtg	95741042
Emergency Preparedness Prog	95761071
Business Continuity Program	95761072
InterAgency Urban Runoff Program	95771011

Project Name	Project Number
Hydrologic Data Msrmt & Mgmt	95811043
X Valley Subsidence Survey	95811049
Benchmark Maintenance (Countywide)	95811050
Watersheds	
Adobe Creek Mitigation Monitoring	10102002
Matadero Overflow Ch Mit Mon	10212011
West Watershed Technical Support	10811042
Bollinger Bridge Mit Mon	20102019
Dntwn Gud Rvr Mitgtn Moni Prog	30151026
Guad Watershed Technical Suppt	30811042
Coyote Creek Mitgtn Monitoring	40212032
Lwr Silver Mitigation & Monitr	40262033
Coy Watrshed Technical Support	40811042
Pajaro Watershed Tech Supp	50811042
Watershed Asset Protection Supp	62011002
Watershed Emergency Operations	62021002
CPRU Tech Support	62021003
Vegetation Mgmt Tech Support	62021004
Stream Stewardship Tech Supp	62021005
Geomorphic Data Analysis	62021007
Electrical Power Support	62021008
Watersheds O&M Eng&Insp Supp	62021009
SMP Program Permit Renewal	62022007
Stream Maint Prog Mgmt	62041022
Flood Mgmt Policy and Coord	62041023
Watersheds Asset Mgt Plng Prgm	62041026
Watersheds Long Term Planning	62041027
Integrated Regional Water Mgmt	62041039
Environmental Services Tech Supp	62041043
Ecological Data Collection and Analysis	62041047
Island Pond Mitigation & Monit	62042032
Stream Gauge Study	62042045
Mitigation&Stwdship Lands Mgmt	62042047
Flood Risk Mapping	62042049
Watersheds Maint Guidelines Update	62042050
Basic Hydrology	62061008
Field Operations Support	62061029
Special Tax Outcome Monitoring	62061030
AM Framework Implementation	62061045
District CMMS Administration	62061046
Safe Clean Water Implementation	62061054
SMP Mitigation Site Mgmt	62181005
Water Resources EnvPlng & Permtg	62741042

Project Name	Project Number
Sandbag Program	62761008
Emergency Preparedness Prog	62761071
Business Continuity Program	62761072
Corps Local Sponsor O&M	62761074
Mgmt of Revegetation Projects	62761075
Arundo Control Program	62762016
InterAgency Urban Runoff Program	62771011
Hydrologic Data Msrmt & Mgmt	62811043
X Valley Subsidence Survey	62811049
Benchmark Maintenance (Countywide)	62811050
District Real Property Administration	62811054
SCW Audits	26002280
Stream Maint Prog Mgmt	26041022
Emergency Response Upgrades	26041023
Flood Risk Reduction Studies	26041024
Ecological Data Collection and Analysis	26041047
Administration	
Environmental Mgmt Sys	60021003
Electrical Power Support	60021008
IMSD - Strategic Plan and Analysis	60061026
AM Framework Implementation	60061045
Admin Asset Mgmt Program	60061053
Local Hazard Mitigation Program	60101018
Software Development and Support	60151001
Network Administration	60181002
Fin Forecasting & CIP Analysis	60221005
Information Mgmt Program Imp	60271063
AM Framework Implementation	70061045
Admin Asset Mgmt Program	70061053

Table 3. Administration Projects

Project Name	Project Number
Water Utility	
Recycled/Purified Water Public Engagement	91151012
SFD Reach 1 Administration	91211005
Unscoped Projects-Budget Only	95001090
Grants Management	95031002
Survey Record Management	95041046
Rental Expense San Pedro,MH	95061012
Water Utility Health & Safety	95061027

Project Name	Project Number
Water Utility Ops Safety Training	95061032
WUE Training & Development	95061037
WUE Administration	95061038
WU As-Built Drawing Control	95061041
WUE Technical Training Program	95061047
W2 W5 Water Revenue Program	95101003
Fin/Economic Water Rate Study	95121001
Water Utility Customer Relations	95151002
Warehouse Services	95811046
District Real Property Administration	95811054
Watersheds	
Rental Expense Stevens Creek	10291002
Rent Exp Guadalupe Prior7/1/01	30061004
Rental Expense Coyote Wtrshd	40061004
Unscoped Projects-Budget Only	62001090
Watershed Revenue	62031001
Grants Management	62031002
Survey Record Management	62041046
Watersheds Administration	62061001
Flood Awareness	62061005
Watershed Ops Safety Implement	62061022
Watershed Ops Safety Training	62061023
WS Training & Development	62061028
Watershed Customer Relations	62061042
Warehouse Services	62811046
Unscoped Projects-Budget Only	26001090
Watershed Revenue	26031001
Rent Exp Clean Safe Ck 7/1/01+	26061002
Stewardship grants and partnerships admin	26061003
Flood Communication and Coordination	26061005
Administration	
Unscoped Projects-Budget Only	60001090
Contract Auditing Financial	60061002
Facilities Env Compliance	60061012
Information Mgmt Services Div Admin	60061017
Procurt & Operational Div Admin	60061018
Employee Recognition Program	60061019
Internal Communications	60061032
District Financial Control	60061050
Directors Fees / Expenses	60091001
Purchasing Services	60101001
Building Services	60101002
District Security Services	60101008

Project Name	Project Number
Audio/Visual Maint / Support	60101011
CADD System Tech Support	60101017
General Accounting Services	60111002
Accounts Payable Services	60111003
Payroll Services	60111004
Contract Services	60111006
Ofc of Chief Admin Officer	60131004
Office of Chief Executive Officer	60131007
Office of the CEO Support	60131014
CEO Management Audit Program	60131015
Office of Ethics and Corp Gov	60131016
District Counsel	60141001
Water Education Program	60171002
Community Relations	60171009
District Space Allocation	60201021
Budget Development & Analysis	60221001
Debt & Treasury Management	60221002
FPMD Administration	60221003
Communications	60231002
Local & Federal Govt Relations	60231003
State Government Relations	60231004
Quality and Env Mgmt Sys Prog	60241026
Payroll & Financial Sys Maint	60271007
Information Security Admin	60271062
Info Sys Consolidation and Integration	60272001
EEO Mandatory Training	60281001
Equal Opportunity Prog	60281003
Diversity and Inclusion Program	60281004
Reasonable Accommodation	60281006
Recruitment and Examination	60291001
Benefits Administration	60291002
Labor Relations	60291003
Talent Management Program	60291004
Classification Program	60291005
Deferred Compensation Committee	60291007
HR Program Admin	60291011
Ethics	60291016
Negotiate MOUs	60291017
Compensation Program	60291018
Bargaining Unit Representation	60291032
GF Training & Development	60291038
Professional and Association Memberships	60291039
Rotation Program	60291040

Project Name	Project Number
College Internship Program	60291041
Skilled Trades Internship Program	60291042
Clerk of the Board Serv	60301001
Board Adv. Comm & Ad Hoc Comm	60301003
Records Management Services	60311001
Request for Public Records	60311002
Word Processing Services	60321001
Research / Library Services	60331001
Mail Services	60341001
Reprographic Services	60351001
Forms Management	60361001
Graphics Services	60361002
Receptionists/Switchboard Sevs	60361004
EOC Switchboard Preparedness	60361005
GF Safety Training & Administration	60411002
Warehouse Services	60811046
Vehicle & Equipment Admin&Mgmt	70061003
Replace Fuel Management System	70062002
Welding Services	70071041
Warehouse Services	70811046
Office Computer Maint& Helpdesk Support	75011001
Liability Property Program	65051001
Workers Compensation Program	65051002
Safety Program Admin	65051003
Risk Management Program Admi	65051004
Safety Committee	65051005
Employee Wellness Program	65051008
District Ergonomics Program	65051009
Industrial Hygiene Program	65051011

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Documentation of UWMP Adoption, Submittal, and Implementation

CONFORMED COPY

File No.: 16-0196

Agenda Date: 4/26/2016
Item No.: 2.1.

BOARD AGENDA MEMORANDUM

SUBJECT:
Resolution Authorizing Publication of Notice Calling For A Public Hearing to Consider Comments from Members of the Public on the Santa Clara Valley Water District's 2015 Urban Water Management Plan Prior to Its Adoption.

RECOMMENDATION:

A. Adopt Resolution AUTHORIZING PUBLICATION OF NOTICE CALLING FOR A PUBLIC HEARING TO CONSIDER COMMENTS FROM MEMBERS OF THE PUBLIC ON THE SANTA CLARA VALLEY WATER DISTRICT'S 2015 URBAN WATER MANAGEMENT PLAN PRIOR TO ITS ADOPTION; and

B. Set time and place for the public hearing to occur on May 24, 2016 at 6:00 p.m. at the Santa Clara Valley Water District Board Chambers, 5700 Almaden Expressway, San Jose, CA 95118.

SUMMARY:
The Santa Clara Valley Water District (District) is preparing the 2015 Urban Water Management Plan (2015 UWMP) that presents Santa Clara County water demand and supply projections through 2040. Pursuant to California Water Code Sections 10610 through 10657 (the Urban Water Management Planning Act), urban water suppliers are required to review, update and adopt an Urban Water Management Plan every five years. The recommendation to hold a public hearing prior to Board adoption of the plan provides a formal opportunity for the public to provide input to the Board. The District's adopted 2015 UWMP must be submitted to the Department of Water Resources by July 1, 2016. Providing the requisite advance notice of the May 24, 2016 public hearing will enable formal participation by the community, the District's retailers, and the cities and County of Santa Clara.

UWMP Overview

This 2015 UWMP documents important information on water supply, water usage, recycled water, water conservation programs, water shortage contingency planning, and water supply reliability in Santa Clara County. It also serves as a valuable resource for water supply planners and policy makers, and addresses the water supply outlook of Santa Clara County over the next 25 years. The 2015 UWMP updates and supersedes all previous District Urban Water Management Plans.
The 2015 UWMP complements other District water resource planning efforts including planning for

ADOPTED
APR 26 2016

annual operations, sustainable groundwater management, recycled water, integrated water resource management, and integrated regional water management. Most importantly, it provides the demand and supply projections that form the basis of updates to the District's Water Supply Master Plan, which presents the District's strategy for providing a reliable future water supply for Santa Clara County and ensuring new water supply investments are effective and efficient.

Coordination with Retailers

Each urban water supplier is required to coordinate the preparation of its plan with other appropriate agencies in the area including other water suppliers. The District's 13 water retailers are the primary stakeholders involved in the preparation of the 2015 UWMP. Coordination with water retailers is primarily through the Water Retailer Subcommittees. In addition, District staff has met with several of the retailers on an individual basis and plans to hold follow-up individual meetings as required over the coming months.

Outreach on 2015 UWMP

The 2015 UWMP was prepared in coordination with the 13 major retailers in Santa Clara County, the cities in Santa Clara County, the County of Santa Clara, the San Francisco Public Utilities Commission (SFPUC), and the Bay Area Water Supply and Conservation Agency (BAWSCA). Urban water suppliers are also required to encourage the active involvement of the public and to hold a public hearing prior to adoption of an Urban Water Management Plan. The recommended public hearing fulfills this requirement. The 2015 UWMP must be adopted and submitted to the California Department of Water Resources (DWR) by July 1, 2016. After the District public hearing on May 24, 2016, the 2015 UWMP will be adopted as prepared or as modified after said hearing. By the end of April 2016, the final version of the 2015 UWMP will be made available to the public on the District's external website and hard copies will be made available at the District's headquarters office for public inspection.

FINANCIAL IMPACT:

There is no financial impact associated with this item.

CEQA:

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

ATTACHMENTS:

Attachment 1: Resolution
Attachment 2: Notice of Public Hearing

UNCLASSIFIED MANAGER:

Garth Hall, 408-630-2750

BOARD OF DIRECTORS
SANTA CLARA VALLEY WATER DISTRICT

RESOLUTION NO. 16 -23

AUTHORIZING PUBLICATION OF NOTICE CALLING FOR A PUBLIC HEARING TO CONSIDER COMMENTS FROM MEMBERS OF THE PUBLIC ON THE SANTA CLARA VALLEY WATER DISTRICT'S 2015 URBAN WATER MANAGEMENT PLAN PRIOR TO ITS ADOPTION

WHEREAS, pursuant to California Water Code Section 10642, the Santa Clara Valley Water District (District) must publish within its jurisdiction public notice of the time and place of the hearing to consider public comment on the District's proposed 2015 Urban Water Management Plan prior to its adoption.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the District:

1. That a public hearing shall be held at the time and place provided in the Notice attached hereto as Exhibit A (Notice) and incorporated herein by this reference to provide the public an opportunity to review and comment on the District's 2015 Urban Water Management Plan prior to its adoption.

2. That the Clerk of the Board shall publish the Notice pursuant to California Government Code Section 6066.

PASSED AND ADOPTED by the Board of Directors of Santa Clara Valley Water District by the following vote on April 26, 2016:

AYES:	Directors	Richard Santos, John Varela, Barbara Keegan, Nai Hsueh, Tony Estremera, Gary Kremen
NOES:	Directors	None
ABSENT:	Directors	Linda LeZotte
ABSTAIN:	Directors	None

SANTA CLARA VALLEY WATER DISTRICT

By:

Barbara Keegan
Chair/Board of Directors

ATTEST: MICHELE L. KING, CMC

Michele L. King

Clerk/Board of Directors

Public hearing notice

Santa Clara Valley Water District

PUBLIC HEARING TO CONSIDER COMMENTS FROM MEMBERS OF THE PUBLIC ON THE SANTA CLARA VALLEY WATER DISTRICT'S 2015 URBAN WATER MANAGEMENT PLAN PRIOR TO ITS ADOPTION.

Topic:	Santa Clara Valley Water District's 2015 Urban Water Management Plan
Who:	Santa Clara Valley Water District (District) Board of Directors
What:	PUBLIC HEARING TO CONSIDER COMMENTS FROM MEMBERS OF THE PUBLIC ON THE SANTA CLARA VALLEY WATER DISTRICT'S 2015 URBAN WATER MANAGEMENT PLAN
When:	Tuesday, May 24, 2016, 6:00 p.m.
Where:	Santa Clara Valley Water District – Headquarters Boardroom **5700 Almaden Expressway, San Jose, CA 95118**

In accordance with the Urban Water Management Planning Act, water suppliers such as the District are required to review, update, and submit an Urban Water Management Plan to the California Department of Water Resources by July 1, 2016, and are required to encourage the active involvement of the public and to hold a public hearing prior to adoption of this plan.

The District's 2015 Urban Water Management Plan (2015 UWMP) documents important information on water supply, water usage, recycled water, water conservation programs, water shortage contingency planning, and water supply reliability in Santa Clara County. It also serves as a valuable resource for water supply planners and policy makers, and addresses the water supply outlook of Santa Clara County over the next 25 years. The 2015 UWMP updates and supersedes all previous District Urban Water Management Plans.

For more information on the public hearing or the 2015 UWMP, please visit our website at www.valleywater.org or contact **Tracy Hemmeter at (408) 630-2647.**

Reasonable efforts will be made to accommodate persons with disabilities wishing to attend this public hearing. For additional information on attending this hearing including requesting accommodations for disabilities or interpreter assistance, please contact the **Office of the Clerk of the Board** at **(408) 630-2277**, at least three business days prior to the hearing.

From: Tracy Hemmeter
To: "ajohnson@bawsca.org"; "jsimunovich@calwater.com"; "rsmelser@ci.gilroy.ca.us"; "nhawk@ci.milpitas.ca.gov"; "smachida@ci.milpitas.ca.gov"; "dan.repp@morganhill.ca.gov"; "Anthony.Eulo@morganhill.ca.gov"; "Elizabeth.Flegel@mountainview.gov"; "alison.turner@mountainview.gov"; "Iris.Lim@mountainview.gov"; "Karla.Dailey@CityofPaloAlto.org"; "cdegroot@santaclaraca.gov"; "mvasquez@santaclaraca.gov"; "jramirez@sunnyvale.ca.gov"; "mnasser@ci.sunnyvale.ca.us"; "tguster@greatoakswater.com"; "pwalter@purissimawater.org"; "Jeffrey.provenzano@sanjoseca.gov"; "bill.tuttle@sjwater.com"; "juliann@stanford.edu"; "takel@akeleng.com"; "amy.fowler@ch2m.com"; "flau@sfwater.org"; "gary@fiske-assoc.com"; "jake.walsh@sjwater.com"; "planninginfo@calwater.com"; "jchang@ci.milpitas.ca.gov"
Cc: Jerry De La Piedra
Subject: UWMP Public Hearing Notice
Date: Tuesday, May 03, 2016 2:04:00 PM
Attachments: image001.png

On April 26, 2016, the Santa Clara Valley Water District Board of Directors set the time and place for the public hearing on the Urban Water Management Plan (UWMP). The hearing is scheduled for Tuesday, May 24, 2016, at 6:00 pm. When the public review draft of the UWMP is ready, it will be posted at: http://www.valleywater.org/Services/WaterSupplyPlanning.aspx.

If you have a questions or comments, please let me know.

Thank you,
Tracy

Santa Clara Valley Water District

TRACY HEMMETER
SENIOR PROJECT MANAGER
Water Supply Planning and Conservation
Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118
(408) 630-2647
themmeter@valleywater.org

5750 Almaden Expressway, San Jose, CA 95118-3614 | (408) 265-2600 | www.valleywater.org

Santa Clara Valley
Water District

May 6, 2016

Subject: Santa Clara Valley Water District's 2015 Urban Water Management Plan

Dear Sir or Madam:

In accordance with the Urban Water Management Planning Act, water suppliers such as the District are required to review, update, and submit an Urban Water Management Plan to the California Department of Water Resources by July 1, 2016, and are required to encourage the active involvement of the public and to hold a public hearing prior to adoption of this plan.

The District's 2015 Urban Water Management Plan (2015 UWMP) documents important information on water supply, water usage, recycled water, water conservation programs, water shortage contingency planning, and water supply reliability in Santa Clara County. It also serves as a valuable resource for water supply planners and policy makers, and addresses the water supply outlook of Santa Clara County over the next 25 years. The 2015 UWMP updates and supersedes all previous District Urban Water Management Plans.

The District's Board of Directors has scheduled a public hearing to consider and take action on the 2015 UWMP at their meeting of Tuesday, May 24, 2016. The meeting will start at 6 p.m. at the Santa Clara Valley Water District Board Room located at 5700 Almaden Expressway, San Jose. Local agencies, water retailers, and the public are encouraged to review the 2015 UWMP and provide any comments prior to, or at, the public hearing.

The 2015 UWMP is available for public review at the District Headquarters Building (5700 Almaden Expressway, San Jose, CA 95118) between 8 a.m. to 5 p.m. weekdays or online at *http://www.valleywater.org/Services/WaterSupplyPlanning.aspx*.

For more information on the public hearing or the 2015 UWMP, please visit our website at www.valleywater.org or contact Tracy Hemmeter by phone at (408) 630-2647 or email at themmeter@valleywater.org.

Sincerely,

Garth C. Hall

Garth Hall
Deputy Operating Officer
Water Supply Division

Nina Hawk
City of Milpitas
455 E. Calaveras Blvd.
Milpitas, CA 95034-5479

Paul Kermoyan
City of Campbell
70 N. First Street
Campbell, CA 95008

Tom Capurso
City of Campbell
70 N. First Street
Campbell, CA 95008

David Brandt
City of Cupertino
10300 N. Wolfe Road
Cupertino, CA 95014-2232

Rick Smelser
City of Gilroy
7351 Rosanna Street
Gilroy, CA 95020

Susan Martin
City of Gilroy
7351 Rosanna Street
Gilroy, CA 95020

Steve Plasecki
City of Los Altos
One North San Antonio Road
Los Altos, CA 94022

Susanna Chan
City of Los Altos
One North San Antonio Road
Los Altos, CA 94022

Brian Leventhal
City of Monte Sereno
18041 Saratoga-Los Gatos Blvd
Monte Sereno, CA 95035

Andrew Crabtee
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037-4128

Karl Bjarke
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037-4128

Michael Fuller
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Randal Tsuda
City of Mountain View
500 Castro Street
P.O. Box 7540
Mountain View, CA 94039-7540

Mike Sartor
City of Palo Alto
250 Hamilton Avenue
Palo Alto, CA 94301

Michael Liw
City of San Jose
200 E. Santa Clara Street
San Jose, CA 95113-1905

Steve McHarris
City of San Jose
200 E. Santa Clara Street
San Jose, CA 95113-1905

Rajeev Batra
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050

Edwin Ordonez
City of Saratoga
13777 Fruitvale Avenue
Saratoga, CA 95070

John Cherbone
City of Saratoga
13777 Fruitvale Avenue
Saratoga, CA 95070

Manuel Pineda
City of Sunnyvale
456 W. Olive Avenue
Sunnyvale, CA 94086

Trudi Ryan
City of Sunnyvale
456 W. Olive Avenue
Sunnyvale, CA 94086

Kirk Girard
County of Santa Clara
70 W. Hedding Street, 7th Floor
San Jose, CA 95110

Mike Harrison
County of Santa Clara
70 W. Hedding Street, 7th Floor
San Jose, CA 95110

Richard Chiu Jr.
Town of Los Altos Hills
26379 Fremont Road
Los Altos Hills, CA 94022

Matt Morley
Town of Los Gatos
110 E. Main St
Los Gatos, CA 95030

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CLEAN RELIABLE WATER
- Where Does Your Water Come From?
- Water Conservation
- Water Charges
- Drinking Water Quality
- Water Supply Planning
  - Water Tracker
  - Integrated Regional Water Management
  - 2010 Urban Water Management Plan
  - Climate Change
  - Desalination
- Projects

FLOOD PROTECTION

HEALTHY CREEKS AND ECOSYSTEMS

PROGRAMS

TECHNICAL INFORMATION

Home > Services > Clean Reliable Water > Water Supply Planning

Water Supply Planning

The Santa Clara Valley Water District has a long history of planning for water supply reliability. Planning in the early 1900s led to the construction of six dams in the 1930s and two in 1950s. Planning in the second half of the 1900s led to construction of three drinking water treatment plants and the development of imported water supplies. Santa Clara County's current water system is a complex mix of water supply sources and infrastructure.

The district operates and maintains ten reservoirs and dams, dozens of groundwater recharge basins, almost 150 miles of pipelines, three treatment plants, an advanced recycled water plant, and three pump stations.

Water supplies include local surface water and groundwater, imported water, and recycled water. Water conservation is also an important part of the of the water supply mix because it offsets water demands.

The district's ongoing planning efforts are designed to protect the existing water supply system, as well as identify the new supplies and infrastructure that will be needed to meet Santa Clara County's future water needs.

2015 Urban Water Management Plan
The district's UWMP is currently being updated. The UWMP documents important information on water supply, water usage, recycled water, water conservation programs, water shortage contingency planning, and water supply reliability in Santa Clara County. It also serves as a valuable resource for water supply planners and policy makers, and addresses the water supply outlook of Santa Clara County over the next 25 years.

The 2015 UWMP updates and supersedes all previous Santa Clara Valley Water District Urban Water Management Plans. Most importantly, it provides the demand and supply projections that form the basis of updates to the district's Water Supply Master Plan, which presents the district's strategy for providing a reliable future water supply for Santa Clara County and ensuring new water supply investments are effective and efficient.

- The 2015 UWMP is due to the Department of Water Resources by July 1, 2016, and is available for public comment through until the close of the public hearing scheduled for 6 p.m. on May 24, 2016
  - Verbal comments on the plan may be made at the public hearing scheduled for May 24, 2016, or by calling Senior Project Manager Tracy Hemmeter at 408-630-2647
  - Written comments may be addressed to Tracy Hemmeter at themmeter@valleywater.org, or by mail to 5750 Almaden Expressway, San Jose, CA 95118 (postmarked by May 19, 2016)
- Draft 2015 Urban Water Management Plan [PDF 1.2 MB]
- Urban Water Management Plan Appendices [PDF 28 MB]

2012 Water Supply and Infrastructure Master Plan
The Santa Clara Valley Water District Board of Directors adopted the Water Supply and Infrastructure Master Plan in October 2012. The Water Master Plan presents an investment strategy, called Ensure Sustainability, for providing a reliable supply of water for Santa Clara County through 2035. The strategy includes continued investment in shoring up the reliability of existing supplies and infrastructure, adding new infrastructure and operations to optimize the current system, and developing potable reuse – the use of purified recycled water for groundwater recharge. In addition, the strategy calls for continued investment in water recycling and conservation.

The Water Master Plan is scheduled to be updated in 2017.

- 2012 Water Supply and Infrastructure Master Plan [PDF]

Other Water Supply Planning Efforts
The Water Master Plan builds on other district planning efforts. The state requires Urban Water Management Plan updates every five years and the federal government requires updates to the Central Valley Project Improvement Act Water Management Plans every five years. You can download copies of these plans from the list on the right.

In addition to local planning efforts, the district participates in integrated regional water management planning activities. More information on these activities can found by using the links on the left.

- Information on the Integrated Water Resources Master Plan can be found here

Related Information
- 2009 California Water Plan
- Central Valley Project Improvement Act Water Management Plan - 2011
- South County Water Supply Plan
- 2010 Urban Water Management Plan
- 2010 Urban Water Management Plan Appendices
- Integrated Water Resources Planning Study 2003
- Integrated Water Resources Plan-Appendixes
- 1996 Integrated Water Resources Plan

Contact Us Web Policies Site Map

The Mercury News
Tuesday, May 10, 2016

Ad Number:	0005724045-01	Advertiser:	Santa Clara Valley Water District
Insertion Number:	N/A	Agency:	N/A
Size:	3 Col x 7.5 in	Section-Page-Zone(s):	B-5-All
Color Type:		Description:	

Public hearing notice

Public Hearing to Consider Comments on the 2015 Urban Water Management Plan

Santa Clara Valley Water District

Topic: Santa Clara Valley Water District's 2015 Urban Water Management Plan

When: Time Certain at 6 p.m. on May 24, 2016

Where: Santa Clara Valley Water District Board Room
5700 Almaden Expressway
San Jose, CA 95118

In accordance with the Urban Water Management Planning Act, water suppliers such as the District are required to review, update, and submit an Urban Water Management Plan to the California Department of Water Resources by July 1, 2016, and are required to encourage the active involvement of the public and to hold a public hearing prior to adoption of this plan.

The District's 2015 Urban Water Management Plan (2015 UWMP) documents important information on water supply, water usage, recycled water, water conservation programs, water shortage contingency planning, and water supply reliability in Santa Clara County. It also serves as a valuable resource for water supply planners and policy makers, and addresses the water supply outlook of Santa Clara County over the next 25 years. The 2015 UWMP updates and supersedes all previous District Urban Water Management Plans.

For more information on the public hearing or the 2015 UWMP, please visit our website at www.valleywater.org or contact **Tracy Hemmeter** at **(408) 630-2647**.

Reasonable efforts will be made to accommodate persons with disabilities wishing to attend this public hearing. For additional information on attending this hearing including requesting accommodations for disabilities or interpreter assistance, please contact the **Office of the Clerk of the Board** at **(408) 630-2277**, at least three business days prior to the hearing.

4/2016_BA

Public Hearing Notice

Boardroom Technology Upgrade Project

Santa Clara Valley Water District

Who: Santa Clara Valley Water District

What: Public hearing on the Engineer's Report

When: May 24, 2016; Item is time certain at 6:00 P.M.

Place: Santa Clara Valley Water District; Boardroom
5700 Almaden Expressway, San Jose, CA 95118

The proposed work ofimprovement is described in the Boardroom Technology Upgrade Project Engineer's Report. The report is on file at the Clerk of the Board of Directors, 5700 Almaden Expressway, San Jose, California and on water district's website: ***http://www.valleywater.org/PublicReviewDocuments.aspx***

The objective of the project is to upgrade the existing 17 years old audiovisual system and bring it to the latest standards of video technology.

At the time and place fixed for the public hearing, the board of directors will receive comments on the Engineer's Report for the project. After considering the comments, the board will decide whether or not to proceed with the project.

For more information about this hearing or this project, contact **Sudhanshu Tikekar** at **(408) 630-2424**.

Reasonable efforts will be made to accommodate persons with disabilities wishing to attend this public hearing. For additional information on attending this hearing, including requesting accommodations for disabilities or interpreter assistance, please contact the **Office of the Clerk of the Board** at **(408) 630-2277**, at least three business days prior to the hearing.

04/2016_LG

The Mercury News

Tuesday, May 17, 2016

Ad Number:	**0005724045-01**	Advertiser:	**Santa Clara Valley Water District**
Insertion Number:	**N/A**	Agency:	**N/A**
Size:	**3 Col x 7.5 in**	Section-Page-Zone(s):	**B-6-All**
Color Type:		Description:	

Public Hearing Notice

Boardroom Technology Upgrade Project

Santa Clara Valley Water District

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When: May 24, 2016; Item is time certain at 6:00 P.M.

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04/2016_LG

Public hearing notice

Public Hearing to Consider Comments on the 2015 Urban Water Management Plan

Santa Clara Valley Water District

Topic: Santa Clara Valley Water District's 2015 Urban Water Management Plan

When: Time Certain at 6 p.m. on May 24, 2016

Where: Santa Clara Valley Water District Board Room
5700 Almaden Expressway
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For more information on the public hearing or the 2015 UWMP, please visit our website at www.valleywater.org or contact **Tracy Hemmeter** at **(408) 630-2647**.

Reasonable efforts will be made to accommodate persons with disabilities wishing to attend this public hearing. For additional information on attending this hearing including requesting accommodations for disabilities or interpreter assistance, please contact the **Office of the Clerk of the Board** at **(408) 630-2277**, at least three business days prior to the hearing.

4/2016_BA

CONFORMED COPY

File No.: 16-0256

Agenda Date: 5/24/2016
Item No.: *2.6.

BOARD AGENDA MEMORANDUM

SUBJECT:
Public Hearing for the 2015 Urban Water Management Plan.

RECOMMENDATION:

A. Open the public hearing for consideration of the District's draft 2015 Urban Water Management Plan;

B. Consider the draft 2015 Urban Water Management Plant and any related public comments thereon;

C. Close the public hearing; and

D. Adopt the resolution ADOPTING THE 2015 URBAN WATER MANAGEMENT PLAN.

SUMMARY:

The Urban Water Management Planning Act (UWMP Act) requires publicly and privately-owned urban water suppliers with greater than 3,000 customers or supplying greater than 3,000 acre-feet per year (AFY) for municipal purposes to update their Urban Water Management Plan (UWMP) every five years. The District's UWMP was last updated in 2011 and District staff has prepared the 2015 UWMP update.

This public hearing provides an opportunity for any interested person to provide comments on the District's draft 2015 UWMP and is being held pursuant to Section 10642 of the California Water Code. The resolution setting the time and place of the public hearing was adopted by the Board on April 26, 2016. The draft 2015 UWMP was released on or before May 13, 2016 for public review.

Staff recommends that the public hearing be closed and that the draft 2015 UWMP be adopted as the final 2015 UWMP by the Board as is or as modified per Board direction. Following adoption by the Board of Directors, the 2015 UWMP will be submitted to the California Department of Water Resources (DWR) by the statutory deadline of July 1, 2016, and/or within 30 days of adoption, whichever comes first.

ADOPTED
MAY 24 2016

Background

The District's draft 2015 UWMP was prepared consistent with the UWMP Act, Water Code Sections 10610 through 10656. It includes a general discussion on the history of the District as well as information on climate, climate change, demographics, and the economy of Santa Clara County (County). Water supply sources including groundwater, local surface water, imported water, and water recycling are also described. In addition, the draft 2015 UWMP includes information on historical water use, water conservation programs, demand projections, water shortage contingency planning, reliability, and constraints on water supplies. It examines the water supply outlook in the County through the year 2040 under different hydrologic conditions (average year, single dry year and multiple dry years) in accordance with DWR guidelines. Note, the analysis performed for the UWMP is focused on supplies and demands at the countywide level and any localized issues such as conveyance limitation and potential local groundwater pumping issues are not addressed. These will be addressed in the District's Water Supply and Infrastructure Master Plan (Water Master Plan) update scheduled for completion in 2017.

Each urban water supplier is required to coordinate the preparation of its UWMP with other appropriate agencies in the area including other water suppliers. The District's water retailers are the primary stakeholders involved in the UWMP preparation. Coordination with water retailers was primarily through the Water Retailer Subcommittees and one-on-one exchanges with individual retailers. All cities within Santa Clara County, the County of Santa Clara, retailers, San Francisco Public Utilities Commission, and Bay Area Water Conservation and Supply Agency were notified by letter at least 60 days prior to the public hearing that the District is in the process of updating its UWMP. District staff also considered comments provided by the Sierra Club, Loma Prieta Chapter, during development of the draft UWMP.

Beyond the statutory deadline for submittal, the District would be ineligible for state grant funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or to receive drought assistance from the state, until the 2015 UWMP is adopted and submitted to DWR.

UWMP Analysis Results

The supply and demand comparison performed as part of the development of the 2015 UWMP indicates that annual supplies are sufficient to meet demands through 2040. In single dry years, staff anticipates that groundwater reserves and carried over surface water will be sufficient to meet demands through at least 2035. The comparison also shows that in most demand scenarios groundwater reserves and carryover storage are depleted under multiple dry year conditions. Without new supplies or a corresponding reduction in long-term demands, water supply shortages and calls for short-term demand reductions will increase in frequency and magnitude over time.

The 2015 UWMP serves as the basis for the District's Water Master Plan. Any supply shortages identified in the 2015 UWMP, and how to best address them, will be evaluated in the District's Water Master Plan update scheduled to be completed in 2017.

FINANCIAL IMPACT:

There is no financial impact associated with this item.

CEQA:
CEQA does not apply to the preparation and adoption of UWMPs (California Water Code Section 10652).

ATTACHMENTS:
Attachment 1: Resolution
Attachment 2: Draft Urban Water Management Plan
*Supplemental Agenda Memo
*Supplemental Attachment 1: PowerPoint
*Supplemental Attachment 2: Sierra Club Letter
*Supplemental Attachment 3: J. Michael, Email
*Supplemental Attachment 4: J. Foley, Email
*Supplemental Attachment 5: Summary of Water Agency Input
*Handout 2.6-A - R. Talley

UNCLASSIFIED MANAGER:
Garth Hall, 408-630-2750

BOARD OF DIRECTORS
SANTA CLARA VALLEY WATER DISTRICT

RESOLUTION NO. 16–50

ADOPTING THE 2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Legislature enacted the Urban Water Management Planning Act requiring publicly and privately-owned urban water supplies with greater than 3,000 customers or supplying greater than 3,000 acre-feet per year (AFY) for municipal purposes to prepare an Urban Water Management Plan; and

WHEREAS, the Santa Clara Valley Water District (District) provides wholesale water supplies of more than 3,000 AFY to water retailers, businesses, and residents in Santa Clara County; and

WHEREAS, the District first prepared an Urban Water Management Plan in 1985 with updates in 1990, 1995, 2001, 2005, and 2011; and

WHEREAS, the Urban Water Management Plan must be reviewed at least once every five years, and the District must make any amendments or changes to its Urban Water Management Plan that are indicated by the review; and

WHEREAS, the District prepared and made available a draft of its 2015 Urban Water Management Plan, and properly noticed a public hearing regarding said plan, which was held on May 24, 2016; and

WHEREAS, the District Board of Directors considered the 2015 Urban Water Management Plan during a public hearing held on May 24, 2016.

NOW, THEREFORE BE IT RESOLVED that the Board of Directors of the Santa Clara Valley Water District does hereby:

1. Adopt the 2015 Urban Water Management Plan;

2. Authorize and direct the Chief Executive Officer (CEO) to file the 2015 Urban Water Management Plan with the California Department of Water Resources, the California State Library, the County of Santa Clara, local cities and towns, and water retailers within 30 days of adoption as described in Section 10644(a) of the California Water Code; and

3. The CEO is hereby authorized and directed to implement the 2015 Urban Water Management Plan in accordance with the Urban Water Management Planning Act.

PASSED AND ADOPTED by the Board of Directors of Santa Clara Valley Water District by the following vote on May 24, 2016:

AYES: Directors T. Estremera, L. LeZotte, G. Kremen, R. Santos, J. Varela, B. Keegan

NOES: Directors None

ABSENT: Directors N. Hsueh

ABSTAIN: Directors None

SANTA CLARA VALLEY WATER DISTRICT

By: ________________________
BARBARA KEEGAN
Chair/Board of Directors

ATTEST: MICHELE L. KING, CMC

Michele L. King
Clerk/Board of Directors

File No.: 16-0327

Agenda Date: 5/24/2016
Item No.:

SUPPLEMENTAL BOARD AGENDA MEMORANDUM

SUBJECT:
Public Hearing for the 2015 Urban Water Management Plan.

REASON FOR SUPPLEMENTAL MEMORANDUM:
To allow for inclusion of more recent information about the development of the 2015 Urban Water Management Plan.

RECOMMENDATION:

A. Open the public hearing for consideration of the District's draft 2015 Urban Water Management Plan;

B. Consider the draft 2015 Urban Water Management Plan and any related public comments thereon;

C. Close the public hearing; and

D. Adopt the Resolution of the Board of Directors of the Santa Clara Valley Water District adopting the 2015 Urban Water Management Plan.

SUMMARY:
The attached PowerPoint presentation summarizes the purpose of the Urban Water Management Plan (UWMP), stakeholder input on the UWMP, and the relationship of the UWMP with other water supply planning efforts. In addition, copies of stakeholder input received as of May 18, 2016 are attached.

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

CEQA:
CEQA does not apply to the preparation and adoption of UWMPs (California Water Code Section

10652).

ATTACHMENTS:
*Attachment 1: PowerPoint
*Attachment 2: Sierra Club Letter
*Attachment 3: J. Michael, Email
*Attachment 4: J. Foley, Email
*Attachment 5: Summary of Water Agency Input

UNCLASSIFIED MANAGER:
Garth Hall, 408-630-2750

Public Hearing

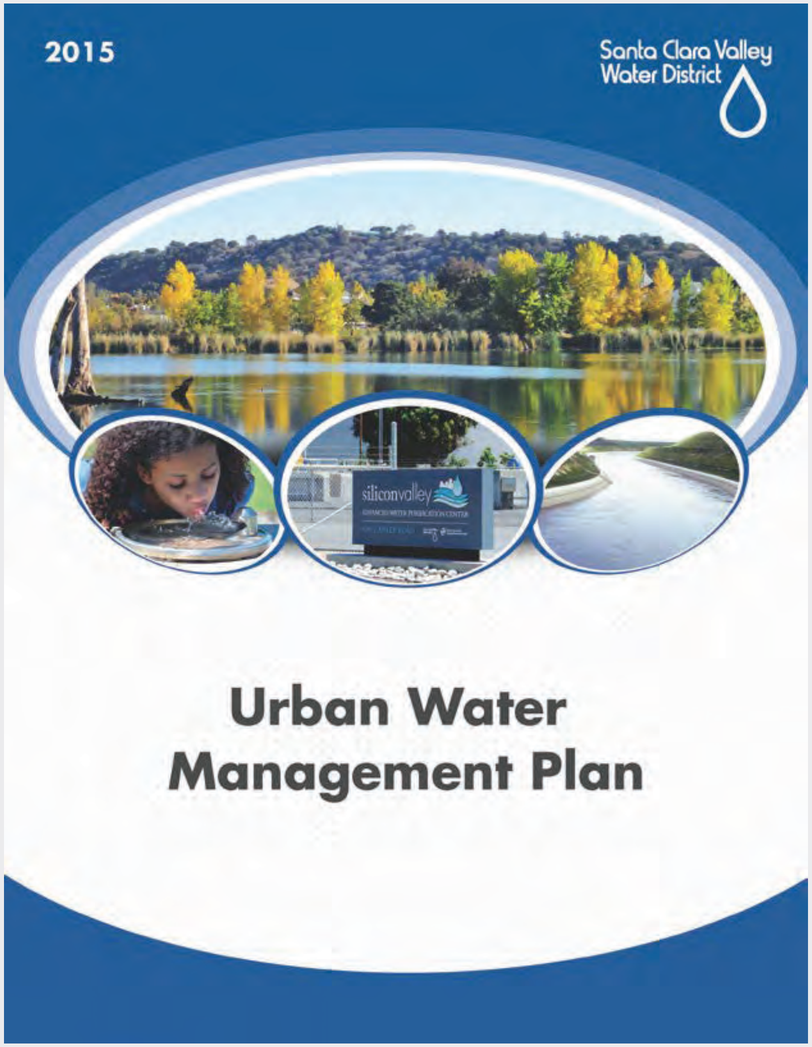
2015 Urban Water Management Plan

May 24, 2016

Santa Clara Valley
Water District

Urban Water Management Plan Overview

SUBTITLE



2015

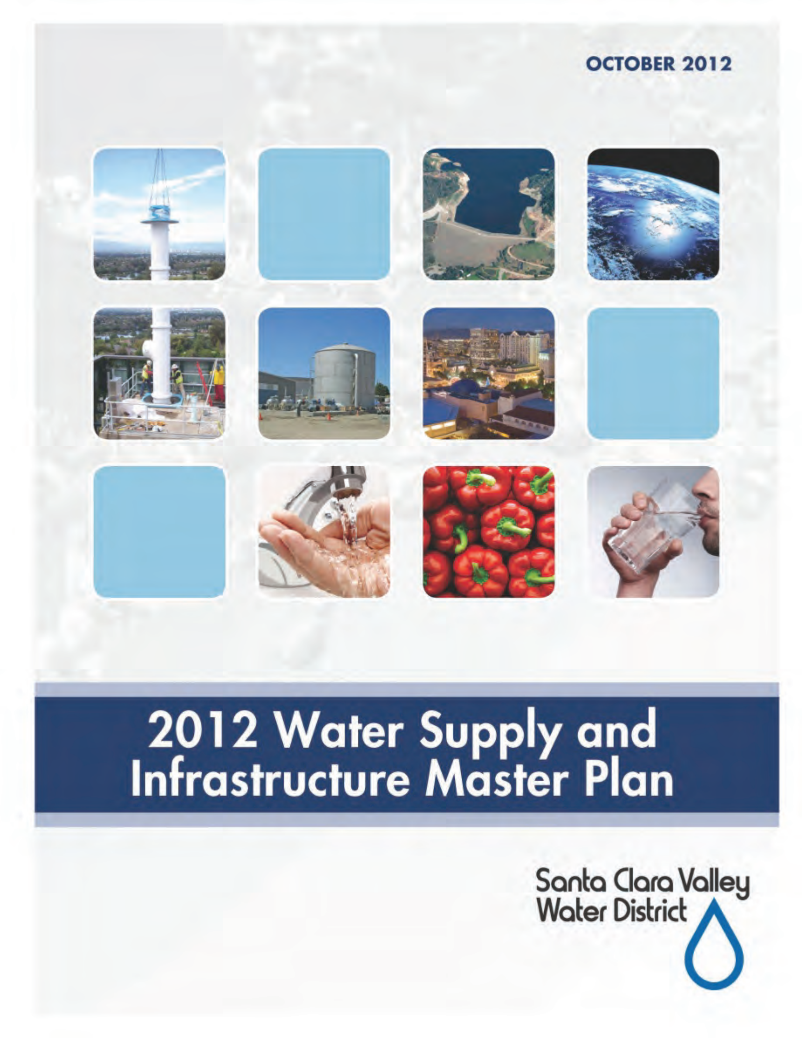
Santa Clara Valley Water District

Urban Water Management Plan

- Required by State law
- Documents projected demands, water conservation programs, and water supply reliability assessment
- Includes the Water Shortage Contingency Plan

Assumptions

- Demands from retailers
- Imported water supplies from 2015 Delivery Capability Report Early Long-Term scenario
- 2012 Water Supply and Infrastructure Master Plan (Water Master Plan) implementation



OCTOBER 2012

2012 Water Supply and Infrastructure Master Plan

Santa Clara Valley Water District

Stakeholder input focused on three areas

- Water shortage contingency planning
- Demand projections
- Reliability analyses

Water retailers

Regional water agencies

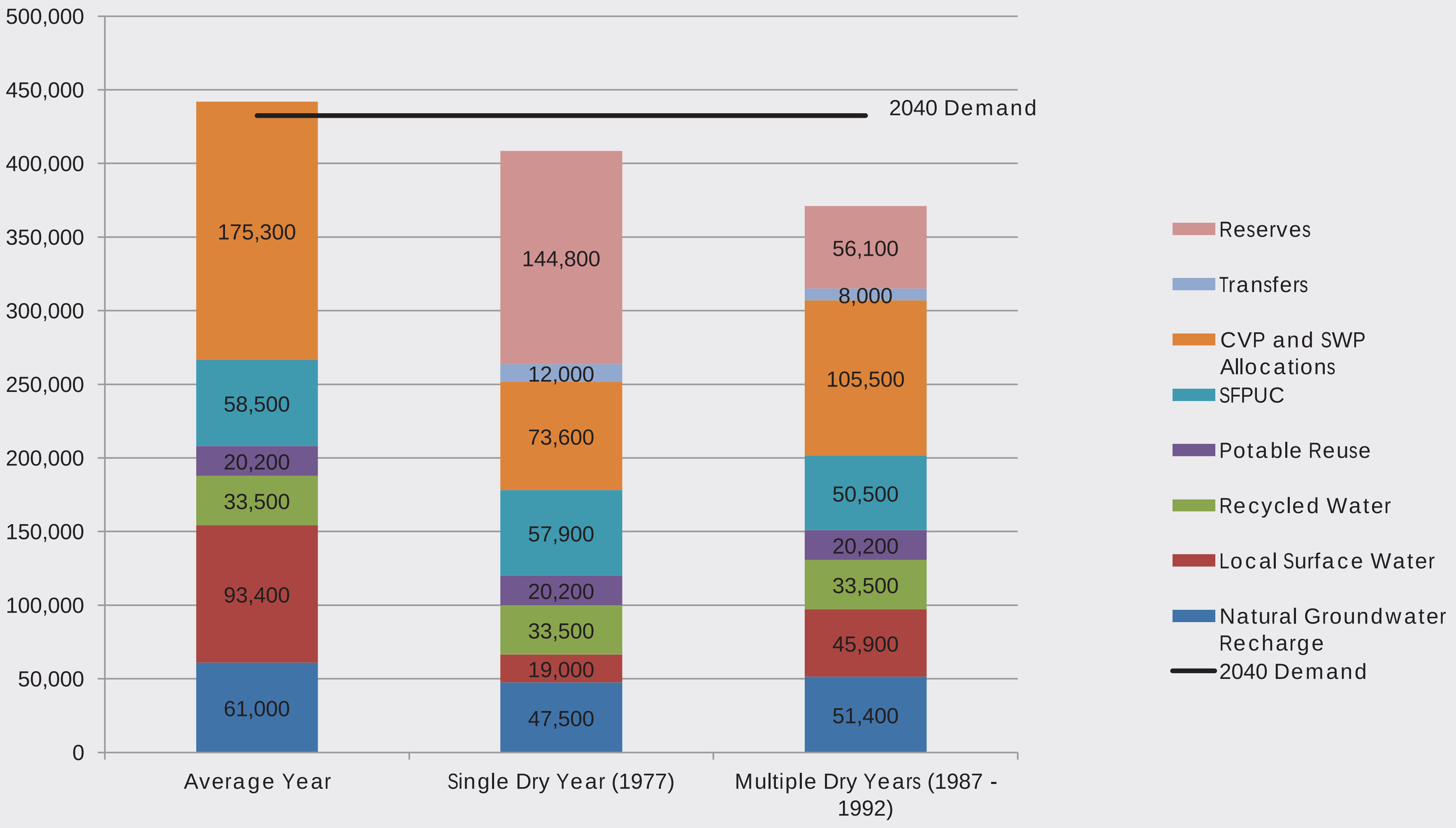
Municipalities

Environmental organizations

State Water Contractors

Academia

Droughts continue to be the greatest challenge



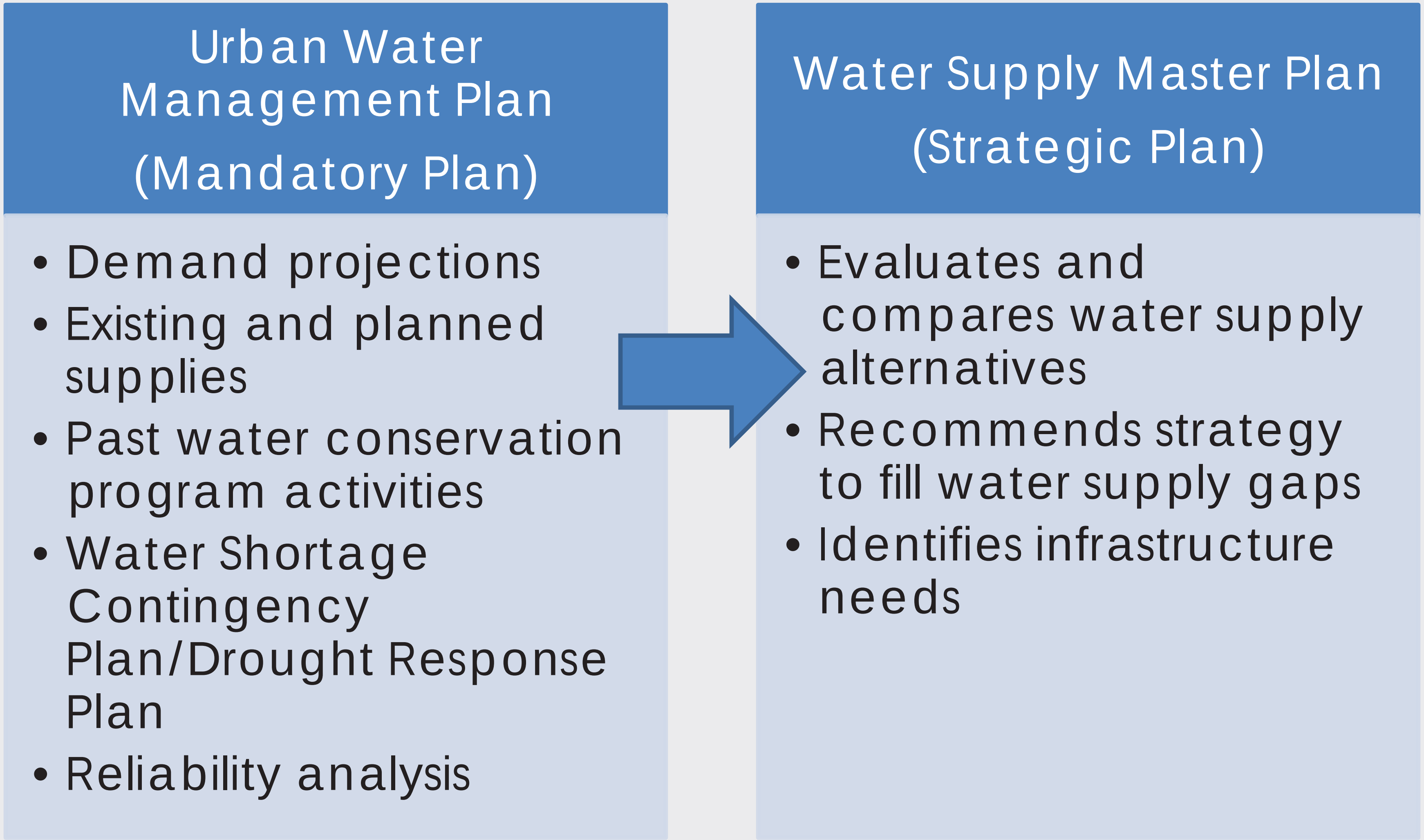
Next Steps

- Finalize Urban Water Management Plan
- Submit plan to State, County, and cities
- Begin Water Master Plan update

Examples of Changes for the Final Urban Water Management Plan

- Incorporate Board direction based on public hearing
- Expanded discussion on reliability analysis
- Correct typos
- Include adoption resolution

Complementary planning efforts



Urban Water Management Plan

(Mandatory Plan)

- Demand projections
- Existing and planned supplies
- Past water conservation program activities
- Water Shortage Contingency Plan/Drought Response Plan
- Reliability analysis

Water Supply Master Plan

(Strategic Plan)

- Evaluates and compares water supply alternatives
- Recommends strategy to fill water supply gaps
- Identifies infrastructure needs

Water supply alternatives for consideration

Groundwater

- Additional recharge capacity
- Preservation or enhancement of natural recharge

Surface Water

- Additional raw water pipelines
- Additional local storage
- Stormwater capture and reuse

Recycled and Purified Water

- Non-potable opportunities
- Potable reuse opportunities (Expedited Purified Water Program)

Imported Water

- California Water Fix
- Transfers
- Statewide storage opportunities

Water Conservation

- Long-term water conservation and water use efficiency programs , including ordinances, green infrastructure/low impact development, advanced metering infrastructure

Regional Solutions

- Los Vaqueros Expansion/Transfer-Bethany Pipeline
- Regional Desalination
- Potable reuse partnerships

Board involvement in alternatives evaluation

Topic	Timeframe
Water Master Plan Approach	Summer 2016
Update on Cost-Benefit Analysis on Imported Water Transfers & Exchanges, WaterFix, Purified Water, and Conservation	Summer 2016
Storage Opportunities	Late 2016
Water Master Plan Supply Options	Spring 2017
Expedited Purified Water Program Planning (pre-RFP work)	Multiple opportunities through early 2017
2017 Water Master Plan Strategy	Early Summer 2017

Sierra Club Loma Prieta Chapter Celebrating 80 years of protecting the planet

3921 East Bayshore Road, Suite 204, Palo Alto, CA 94303
loma.prieta.chapter@sierraclub.org | TEL - (650) 390-8411 | FAX - (650) 390-8497

March 28, 2016

Tracy Hemmeter, Senior Project Manager
Water Supply Planning and Conservations
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

RE: 2015 Urban Water Management Plan and Water Supply Planning

Dear Ms. Hemmeter,

I'm writing to express the intention of the local Sierra Club Water Committee to comment on the Santa Clara Valley Water District (SCVWD) 2015 Urban Water Management Plan (UWMP) when the draft is released in April 2016. In addition, given the importance of the UWMP as a planning document, we feel the need to present preliminary comments while the draft is still under development.

The UWMP is not just a reporting exercise. It is a plan for the future. As stated on the DWR website:

> Urban Water Management Plans (UWMPs) are prepared by California's urban water suppliers to support their long-term resource planning, and ensure adequate water supplies are available to meet existing and future water demands.

Therefore we submit the following general comments related to estimating supply and demand and we urge District staff to take these comments into account during development of the 2015 UWMP.

A. SUPPLY

We want to ensure that the UWMP realistically projects future supply, which includes taking into account the current drought and climate change. In particular,

1. SCVWD should not rely on the 2015 State Water Project Delivery Capability Report which is still based on 2003 data and thus promises unrealistically high deliveries to its contract agencies (see attached paper released by the Sierra Club in January 2016). SCVWD needs to address the impact of climate change on supply.
2. Future water supply needs to reduce reliance on imports as a share of water supply to reduce vulnerability to climate change and droughts, and to help the imperiled Bay Delta ecosystem.
3. SCVWD needs to increase reliance on conservation, loss prevention, storm water capture, and recycling as a percentage of water supply.
4. This shift in water supply ratios is supported by District projects such as the Expedited Purified Water Program with the City of San Jose, and a Storm Water Resource Plan with the Santa Clara Valley Urban Runoff Pollution Prevention Program, as well the integrated water resource master plan called the One Water Plan.

Otherwise it is likely the UWMP will document overly optimistic water supply projections, possibly leading to unrealistic water guarantees and unsustainable development.

B. DEMAND

We want to ensure that the UWMP realistically projects future demand, which includes use of accurate population growth models and per capita usage assumptions that reflect the reality of climate change and drought. In particular,

1. As an alternative to the Association of Bay Area Governments (ABAG) population growth projections, we ask the District to consider population growth projections using the model available on the Department of Water Resources website. The ABAG projections have been questioned in the past so alternative projections using a range of scenarios will increase confidence in demand projections.
2. During the drought, the benchmark for San Jose Water Company was 59 residential gallons per capita per day (GPCD). Assuming continued robust water conservation efforts, the plan should assume an even lower benchmark by 2025 for future residential demand calculations.

Otherwise it is likely the UWMP will document overly optimistic water demand projections, possibly compelling the District to seek new water supplies and unnecessarily spending money on new infrastructure, etc.

In summary, we encourage SCVWD to robustly address these suggestions in your 2015 UWMP and move towards enhanced regional self-sufficiency and reduced reliance on imports.

Thank you for making sure we are notified of any public document releases or public meetings on this topic. We look forward to future opportunities to give input and comment on the 2015 UWMP.

Respectfully Submitted,

Katja Irvin

Katja Irvin, AICP
Chair, Water Committee
Sierra Club Loma Prieta Chapter

Attachments:
Urban Water Management Plans: California Needs to Connect Urban Development With Real Water, Sierra Club California, January 2016

Cc:
Mike Ferreira, Conservation Committee Chair, Sierra Club Loma Prieta Chapter
Board of Directors, Santa Clara Valley Water District
Garth Hall, Deputy Operating Officer for Water Supply, Santa Clara Valley Water District

From: Jeffrey Michael
To: Tracy Hemmeter
Subject: comment on draft 2015 UWMP
Date: Friday, May 13, 2016 5:55:50 PM

Tracy,

I found the demand projections in the draft 2015 UWMP to be implausible. I have a significant professional background in forecasting, and have used the quote about all models being wrong myself, but that is not an excuse to project substantial increases in the face of what is a very clear downward trend. I don't have to know and criticize the technical aspects of the models to see that there is something seriously wrong here.

It is hard to believe that the demand forecast has actually increased since the 2010 UWMP when the population forecast has decreased as shown in the table below.

	SCVWD 2010 UWMP	SDVWD 2015 draft UWMP (published may 2016)
2035 population	2.431 million	2.303 million
2035 water demand	422,920 af	425,600 af

Other urban water districts have substantially reduced their projections in their 2015 UWMP in the face of similar changes, and most of them are also likely underestimating future conservation.

For example, Metropolitan water district has reduced their forecasted demand by 400,000 acre feet in response to slower population growth and denser development patterns. As discussed in this article, http://timesofsandiego.com/politics/2016/04/30/water-authority-plan-forecasts-14-lower-water-use-in-2020/, San Diego County Water Authority has also significantly reduced their forecasted demand "The water authority estimates that future water demands will be about 14 percent lower in 2020 and 15 percent lower in 2035 compared to projections in the 2010 plan."

Even if SCVWD is being conservative and ensuring there is a buffer against future uncertainties, a projection above 400,000 af in 2035 is implausible given the trends over the past 25 years shown in Figure 4-1. The forecast shown in the dotted line in Figure 4-5 is ridiculous. There is a clear downward trend in the data, even ignoring the recent droughts, and SCVWD is not adding land to its service area and its population base is growing more slowly than in the past and in a denser development pattern. On top of this, you are serving a region with a significant environmental ethic that is dependent on environmentally damaging imported water. It seems that the forecast is not only out of touch with the economic and demographic trends, but is also out of touch with a community that would support reducing its environmental impact as well as state law requiring increased conservation and reduced dependence on the Delta.

In my professional opinion as an experienced forecaster, I believe SCVWD is overestimating its 2035 water demand by at least 50,000 af. Using such an exaggerated forecast for planning could lead to poor investment decisions with significant negative economic and environmental consequences. Thank you for the opportunity to comment.

Dr. Jeffrey Michael
Executive Director, Center for Business and Policy Research, Eberhardt School of Business
Professor of Public Policy, McGeorge School of Law
University of the Pacific
Sacramento: 916.340.6084
Stockton: 209.946.7385
Cell: 209.662.5247
jmichael@pacific.edu

From: Jim Fiedler
To: Garth Hall; Jerry De La Piedra; Tracy Hemmeter
Subject: FW: Urban Water Management Plans - Responsible Charge/Signing and Sealing
Date: Monday, April 25, 2016 6:52:08 PM
Attachments: BPELSG DWR UWMP Letter.pdf
image001.png

FYI

JIM FIEDLER, P.E., D.WRE
CHIEF OPERATING OFFICER
Water Utility Enterprise
Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118
(408) 630-2736
jfiedler@valleywater.org

From: Jim Foley [mailto:jim@jimfoley.com]
Sent: Monday, April 25, 2016 5:10 PM
To: Nai Hsueh; Barbara Keegan; Jim Fiedler
Subject: Urban Water Management Plans - Responsible Charge/Signing and Sealing

Hello Barbara, Nai, and Jim –

Last year BPELSG looked at Urban Water Management Plans (UWMP) as required by the CA DWR. I've attached a letter from BPELSG to DWR regarding BPELSG requirements of the Professional Engineers Act and the Geologists and Geophysicists Act. DWR chose not to include the requested language in their Final Guidebook – March 2016. http://www.water.ca.gov/urbanwatermanagement/docs/2015/UWMP_Guidebook_Mar_2016_FINAL.pdf As I'm sure you all know, to the extent the UWMPs require engineering or geology, a Professional Engineer or Geologist must be in "responsible charge" of the work and must "sign and seal" accordingly.

I noticed that in the last UWMP prepared by SCVWD, there was a significant amount of work requiring professionals in "responsible charge" but no one had "signed and sealed" the appropriate sections of the plan as required.

Since the deadline for submission is July 1, 2016, I wanted to make you all aware of BPELSG requirements since DWR chose not to include them in their Guidebook.

Be sure to call or email me if you have any questions.

Thanks,

Jim Foley
(408) 777-9917
www.jimfoley.com

Summary of Water Agency Input on the District's 2015 Urban Water Management Plan

Noted by District Staff in Meetings and Conference Calls with Retailers in the Period February 25, 2016 through May 16, 2016

- Correct miscellaneous typographic errors
- Clarify tables
- Correct demands
- Further explain and clarify assumptions
- Explain differences between tables
- Add information on Advanced Metering Infrastructure grant projections
- Further explain statements regarding imported water, including State Water Project and Central Valley Project allocations and San Francisco Public Utilities Commission supplies and demands
- Include a water supply and use schematic
- Use 2013-2015 as the multiple year drought

5/19/2016 (Orig) M. King (BK)
Interim CEO N. Camacho

Handout 2.6-A
05/24/16

Ms. Barbara Keegan, Chair
Board of Directors
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118-3686

May 18, 2016

Subject: Urban Water Management Plan (UWMP)

Dear Ms. Keegan:

The District needs to provide additional water supplies and/or storage to reduce the frequency of conditions requiring short-term water use reductions. Periodic calls for 5, 10, or 20 percent reductions seemed to have become normal operations rather than contingency responses.

The District's water shortage management objective is to "Minimize economic, social, and environmental hardships to the community". Unfortunately San Jose Water Company (SJWCo) has adopted a drought response plan that unfairly targets above-average water users and puts an onerous burden on large families, citizens concerned with preserving and protecting our street trees and urban forest, people trying to grow their own fruits and vegetables, and similar above-average water users. Even a 5% reduction, a water use allocation which is minimal for most, becomes 10, 20 even 40 percent for some users under the SJWCo plan.

Each retailer prepares their own short-term water use reduction plan but the SJWCo plan is inconsistent with the District's objectives to minimize hardships and have consistent policy development. The SJWCo plan is dramatically different from other city/retail water providers and previous precedents.

The District plans for the future should minimize the need for any calls for water use reduction.

If the SJWCo plan remains, any vote on funding future water infrastructure, to be fair, would need to be based on water use. Those carrying the burden should have a proportionately greater say in the outcome.

Sincerely,

Randy Talley

Randy Talley
158 Alice Ave.
Campbell, Ca. 95008

Handout 2.6-B
05/24/16

Michele King

From:	Katja [katja.irvin@sbcglobal.net]
Sent:	Monday, May 23, 2016 9:51 PM
To:	Clerk of the Board; Barbara Keegan; Gary Kremen; Richard Santos; Linda LeZotte; John Varela; Tony Estremera; Nai Hsueh
Cc:	Tracy Hemmeter; Jerry De La Piedra; Garth Hall; 'Kyle Jones'; 'Mike Ferreira'
Subject:	May 24 2016 Agenda Item 2.6 Public Hearing for the 2015 Urban Water Management Plan
Attachments:	SCLP letter 2015 UWMP May 2016.pdf; Urban Water Management Plans fact sheet 1-26-16.pdf; 5-18-16 SJ Merc Commentary from San Diego.pdf; SCLP letter 2015 UWMP March 2016.pdf

Dear Clerk and Members of the Board,

Thank you for considering public comments related to the subject hearing on the District's 2015 Urban Water Management Plan (UWMP). A follow up to our March 2016 letter that raised issues about the UWMP is attached.

We are in the process of drafting more in-depth comments on the UWMP but we have not been able to complete them within the 2-week review period. In general this lack of public outreach and review indicates that the UWMP process is very broken in Santa Clara County. We would have liked to review the retailers plans before the SCVWD plan and evaluate how they line up. As it turns out, the largest retailer, San Jose Water Company, will be releasing their draft plan on May 24, the same date as the subject hearing.

Please consider these circumstances and our other comments and make a motion to use the UWMP information as only preliminary to future water demand and supply projections and development guidelines that may be developed in other water plans before the 2020 UWMP cycle.

Thank you for your consideration.

Sincerely,

Katja Irvin, AICP
Water Committee Chair
Sierra Club Loma Prieta Chapter

NOTED
MAY 24 2016

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May 23, 2016

Board of Directors
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

RE: 2015 Urban Water Management Plan and Water Supply Planning

Dear Chair Keegan and Members of the Board,

On March 28, 2016, the Sierra Club Loma Prieta Water Committee sent comments for the Santa Clara Valley Water District 2015 Urban Water Management Plan (UWMP) to staff and copied the Board of Directors. The Draft 2015 UWMP was released on May 13, 2016. See our assessment below about how our March comments were addressed.

We see major issues with the draft UWMP that cannot be corrected before the July 2016 deadline for submission to the State. It is unacceptable that this plan will be the main source of information and direction for water management and land use planning through 2020. Therefore we would like to work with the District to support directions for water management that would not be tied to this plan. To begin with, this would apply to the upcoming Water Master Plan, Recycled Water Master Plan, Groundwater Management Plan updates, and the One Water Plan.

Our previous comments follow, with additional comments related to the Draft UWMP highlighted in *italics* and suggestions in ***bold***.

A. SUPPLY

We want to ensure that the UWMP realistically projects future supply, which includes taking into account the current drought and climate change. In particular,

1. SCVWD should not rely on the 2015 State Water Project Delivery Capability Report which is still based on 2003 data and thus promises unrealistically high deliveries to its contract agencies (see attached paper released by the Sierra Club in January 2016). SCVWD needs to address the impact of climate change on supply. *The Draft UWMP (pg. 6-8) says SWP and CVP allocations are based on the State Water Project Delivery Capability Report 2015. The Capability Report does not adequately address climate change impacts and the data presented in the UWMP makes no attempt to compensate for the shortcomings of the Capability Report.* ***The UWMP should include likely alternatives to the 2015 State Water Project Delivery projections that are based on updated climate change scenarios.***
2. Future water supply needs to reduce reliance on imports as a share of water supply to reduce vulnerability to climate change and droughts, and to help the imperiled Bay Delta ecosystem. *Table 6-6 (pg. 6-11) shows an increase in supplies provided by the Central Valley and State Water Projects rather than a decrease in such supplies that is needed for the ecosystem.* ***The UWMP***

should present alternative strategies to reduce CVP and SWP imports as was done in San Diego (see San Jose Mercury News op-ed attached).

3. SCVWD needs to increase reliance on conservation, loss prevention, storm water capture, and recycling as a percentage of water supply. *With conservation, storm water capture and recycling, the district should be able to keep demands down and decrease the slice of the water supply pie that comes from the Delta though the Central Valley and State Water projects.* ***The UWMP should aim to emulate the model set forward in the Los Angeles Department of Water and Power UWMP, which shows a decrease in reliance on Delta imports and an increase conservation, storm water capture, and recycling.***
4. This shift in water supply ratios is supported by District projects such as the Expedited Purified Water Program with the City of San Jose, and a Storm Water Resource Plan with the Santa Clara Valley Urban Runoff Pollution Prevention Program, as well the integrated water resource master plan called the One Water Plan. *It isn't clear how this UWMP will interact with these planning efforts.* ***The UWMP needs to discuss the potential for these water supply programs in more detail, coupled with continued conservation, to present an alternative enhanced supply/low water use scenario.***

Otherwise it is likely the UWMP will document overly optimistic water supply projections, possibly leading to unrealistic water guarantees and unsustainable development. ***The Draft UWMP should address sustainable water use and limits on development.***

B. DEMAND

We want to ensure that the UWMP realistically projects future demand, which includes use of accurate population growth models and per capita usage assumptions that reflect the reality of climate change and drought. In particular,

1. As an alternative to the Association of Bay Area Governments (ABAG) population growth projections, we ask the District to consider population growth projections using the model available on the Department of Water Resources website. The ABAG projections have been questioned in the past so alternative projections using a range of scenarios will increase confidence in demand projections. *The UWMP continues to use ABAG growth projections from 2013 in the Draft 2015 UWMP (Table 3-2, pg. 3-6) and did not consider a range of growth scenarios as suggested. Furthermore, all lower growth scenarios submitted by cities and retailer suppliers were ignored in favor of presenting only the ABAG assumptions in the tables and graphs.* ***Decision-makers and the public need the alternative growth scenarios to be clearly documented in the UWMP.***
2. During the drought, the benchmark for San Jose Water Company was 59 residential gallons per capita per day (GPCD). Assuming continued robust water conservation efforts, the plan should assume an even lower benchmark by 2025 for future residential demand calculations. *The District UWMP conveniently says "Wholesale water suppliers such as the District, are not required to establish and meet baseline and targets for daily per capita water use" (pg. 5-1). The District takes no responsibility and offers no information to help assess the 20% by 2020 goals set forward in SBX7-7.* ***The District should take a role in tracking the 20% by 2020 goals and per capita water use, and include a countywide summary in the UWMP.***

Otherwise it is likely the UWMP will document overly optimistic water demand projections, possibly compelling the District to seek new water supplies and unnecessarily spending money on new infrastructure, etc. *Although the Draft UWMP says on one hand that the District needs to be careful about over projecting demand (Section 4.3.4, pg. 4-7), the UWMP goes on to project complete recovery to pre-drought demand within 3 years and substantial growth in demand beyond that*

> *period. The discussion about the impact of continuing water conservation, etc. is not reflected in the data presented (Figure 4-6, pg. 4-5).* ***Demand growth assumed in the UWMP seems unrealistic and we request that the UWMP present a range of demand projections that include ongoing conservation and lower population growth estimates.***

Please consider these comments and request a future item to consider the impact of the URWP and how they can be balanced with reality.

Respectfully Submitted,

Katja Irvin

Katja Irvin, AICP
Chair, Water Committee
Sierra Club Loma Prieta Chapter

Attachments:
Urban Water Management Plans: California Needs to Connect Urban Development With Real Water, Sierra Club California, January 2016
Mercury News Editorial, Mark Weston, Chair, Diego County Water Authority Board of Directors, May 18, 2016

Cc:
Mike Ferreira, Conservation Committee Chair, Sierra Club Loma Prieta Chapter
Garth Hall, Deputy Operating Officer for Water Supply, Santa Clara Valley Water District
Jerry De La Piedra, Unit Manager, Water Supply Planning & Conservation
Tracy Hemmeter, Senior Project Manager

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March 28, 2016

Tracy Hemmeter, Senior Project Manager
Water Supply Planning and Conservations
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

RE: 2015 Urban Water Management Plan and Water Supply Planning

Dear Ms. Hemmeter,

I'm writing to express the intention of the local Sierra Club Water Committee to comment on the Santa Clara Valley Water District (SCVWD) 2015 Urban Water Management Plan (UWMP) when the draft is released in April 2016. In addition, given the importance of the UWMP as a planning document, we feel the need to present preliminary comments while the draft is still under development.

The UWMP is not just a reporting exercise. It is a plan for the future. As stated on the DWR website:

> Urban Water Management Plans (UWMPs) are prepared by California's urban water suppliers to support their long-term resource planning, and ensure adequate water supplies are available to meet existing and future water demands.

Therefore we submit the following general comments related to estimating supply and demand and we urge District staff to take these comments into account during development of the 2015 UWMP.

A. SUPPLY

We want to ensure that the UWMP realistically projects future supply, which includes taking into account the current drought and climate change. In particular,

1. SCVWD should not rely on the 2015 State Water Project Delivery Capability Report which is still based on 2003 data and thus promises unrealistically high deliveries to its contract agencies (see attached paper released by the Sierra Club in January 2016). SCVWD needs to address the impact of climate change on supply.
2. Future water supply needs to reduce reliance on imports as a share of water supply to reduce vulnerability to climate change and droughts, and to help the imperiled Bay Delta ecosystem.
3. SCVWD needs to increase reliance on conservation, loss prevention, storm water capture, and recycling as a percentage of water supply.
4. This shift in water supply ratios is supported by District projects such as the Expedited Purified Water Program with the City of San Jose, and a Storm Water Resource Plan with the Santa Clara Valley Urban Runoff Pollution Prevention Program, as well the integrated water resource master plan called the One Water Plan.

Otherwise it is likely the UWMP will document overly optimistic water supply projections, possibly leading to unrealistic water guarantees and unsustainable development.

B. DEMAND

We want to ensure that the UWMP realistically projects future demand, which includes use of accurate population growth models and per capita usage assumptions that reflect the reality of climate change and drought. In particular,

1. As an alternative to the Association of Bay Area Governments (ABAG) population growth projections, we ask the District to consider population growth projections using the model available on the Department of Water Resources website. The ABAG projections have been questioned in the past so alternative projections using a range of scenarios will increase confidence in demand projections.
2. During the drought, the benchmark for San Jose Water Company was 59 residential gallons per capita per day (GPCD). Assuming continued robust water conservation efforts, the plan should assume an even lower benchmark by 2025 for future residential demand calculations.

Otherwise it is likely the UWMP will document overly optimistic water demand projections, possibly compelling the District to seek new water supplies and unnecessarily spending money on new infrastructure, etc.

In summary, we encourage SCVWD to robustly address these suggestions in your 2015 UWMP and move towards enhanced regional self-sufficiency and reduced reliance on imports.

Thank you for making sure we are notified of any public document releases or public meetings on this topic. We look forward to future opportunities to give input and comment on the 2015 UWMP.

Respectfully Submitted,

Katja Irvin

Katja Irvin, AICP
Chair, Water Committee
Sierra Club Loma Prieta Chapter

Attachments:
Urban Water Management Plans: California Needs to Connect Urban Development With Real Water,
Sierra Club California, January 2016

Cc:
Mike Ferreira, Conservation Committee Chair, Sierra Club Loma Prieta Chapter
Board of Directors, Santa Clara Valley Water District
Garth Hall, Deputy Operating Officer for Water Supply, Santa Clara Valley Water District

Urban Water Management Plans: California Needs to Connect Urban Development With Real Water

California requires all water districts that provide water to urban customers to prepare Urban Water Management Plans and update them on a regular basis (Water Code Sections 10610-10656). The plans must provide information about how much water each water agency or purveyor manages in a normal year, a “wet” year, and “dry” and “very dry” years. The plans must also forecast future water demand within their district boundaries and detail how water supplies will be provided over the next twenty years to serve future growth.

Working in tandem with the Urban Water Management Plans, two major pieces of legislation were adopted in 2003. The “Show Me the Water” bills (SB 610 and SB 221) were intended to coordinate local water supplies and land use decisions by requiring water agencies to prepare water assessments and written verification of water supplies for residential developments of 500 units or more.

These laws were a good start towards preventing near disasters like the one that occurred last year involving Mountain House, a planned community of 11,000 homes near Tracy in San Joaquin County. The unincorporated community came close to running out of water when its sole supplier’s Delta water rights were terminated due to California’s historic drought. This and many other examples up and down the state illuminate the need to tighten our water planning statutes and requirements when new growth is proposed.

Water agency assessments and verifications of water supplies are based on their Urban Water Management Plans but there’s no requirement that these plans reflect current reality.

- California requires water agencies to update Urban Water Management Plans every five years to ensure the agencies have long-term reliable supplies to meet the demands of current and future customers.
- Both SB 610 and SB 221 identify Urban Water Management Plans as the planning document that should be used to meet the requirements of these statutes. Urban Water Management Plans are intended to work in concert with cities’ and counties’ General Plans in planning new development projects.
- Though California requires water agencies to produce Urban Water Management Plans, no attempt is made to verify the accuracy of the supply or demand projections in these plans.
- Los Angeles’ 2010 plan overestimated average annual deliveries from the State Water Project to Southern California’s water wholesaler, the Metropolitan Water District, for the most recent ten years by a factor of two, and overestimated the minimum amount of water it would receive in a critically dry year by a factor of three. Documents with estimation errors of this magnitude should not be used to plan the use of resources critical to our future.

The State Water Project, a major supplier of water to communities in Southern California and the Bay Area, continues to provide unrealistic assumptions about the amount of water it can deliver.

- The State Water Project is a major supplier of water to Silicon Valley and Southern California.
- Every two years, the State Water Project produces a Delivery Capability Report to aid its customers in developing their Urban Water Management Plans.
- The 2015 version of the Delivery Capability Report does not take the realities of the current drought into account. The State Water Project continues to promise more water than it has been able to deliver over the past ten years.
- The latest Delivery Capability Report makes no provision for the impacts of climate change that could dramatically change future water supplies, such as a dwindling Sierra snowpack. The report continues to base its water delivery model on historical data that ends in 2003.

Urban Water Management Plans and the State Water Project Delivery Capability Report must reflect the reality of California's most recent drought, and must not ignore the impacts of climate change.

- The 2015 Urban Water Management Plans are not required to consider climate change, and the State Water Project Delivery Capability Report makes no attempt to include climate change in its delivery projections.
- The most important water supply documents underpinning growth and development must reflect climate change in their projections.

The "Show Me the Water" bills need to be tightened so that all significant new development (not just subdivisions over 500 units) also requires a water assessment and written verification of water supply.

- Because California faces an uncertain water future, any significant new development should be subject to the provisions of SB 610 and SB 221 so that the cumulative effects of all new development are taken into account when planning local and regional water supplies.

The original Urban Water Management Plan legislation needs to be amended to include a verification procedure for water supply and demand estimates.

- Urban Water Management Plans need to be based on actual, not paper water. The State needs to include an independent verification of water supplies in its Urban Water Management Plan process for at least the largest water districts.

For more information, contact:

Kyle Jones
(916) 557-1107
Kyle.Jones@sierraclub.org

January 2016

Handout 2.6-B
05/24/16

Weston: San Diego is a model for water conservation

By Mark Weston
Special to The Mercury News
The Mercury News

Posted:Mon May 16 14:00:00 MDT 2016

As California seeks solutions to its complex water needs, one barrier is the perpetuation of misconceptions about the differences between north and south. While there are important distinctions, there are also significant areas of common ground.

Indeed, San Diego County and the Bay Area share a commitment to making the most of every drop of water, as well as a common desire for the Sacramento-San Joaquin Delta to meet the coequal goals of water supply reliability and environmental restoration.

Unfortunately, some Northern Californians maintain outdated beliefs about our water use that the facts simply don't support. While San Diego County is just one part of Southern California, our aggressive water conservation and supply diversification efforts have made it a model for how sound planning can meet regional water needs.

San Diego County residents have reduced per capita potable water use by nearly 40 percent since 1990, while our population has grown by one-third and our regional economy has nearly doubled. Since state-mandated water-use reductions started in June 2015, our regional potable water use is down by 21 percent, beating the state's cumulative target for our region's water agencies. In addition, we are committed to promoting a water smart culture for San Diego County that transcends the drought; our vision for water-efficient living is robust, enduring and supported by an array of programs to promote water-use efficiency.

It's instructive to compare the City of San Diego and the San Jose Water Company, two major water retailers. San Diego receives average annual rainfall of only 10 inches, yet boasts residential per capita water use of just 57 gallons per day, according to state figures from June 2015 through March 2016. San Jose receives 15 inches of rain on average each year — 50 percent more rainfall — but state figures show residential per capita water use is slightly higher than San Diego's at 62 gallons per day. These admirable conservation figures place these two cities among the most water-efficient in the state, and demonstrate a shared and strong commitment to conservation.

Our conservation efforts reduce demands on the Delta. We are doing that another way as well: The San Diego County Water Authority has spent billions of dollars diversifying our water supplies to consciously decrease our dependence of Bay-Delta water. Those investments include large-scale water conservation-and-transfer agreements for Colorado River water, recycled water, and the nation's largest seawater desalination plant.

Between 1990 and 2020, the Water Authority will have reduced its purchases from the Metropolitan Water District of Southern California — our only supplier of Delta water — by about 75 percent.

There are also misconceptions about "Southern California's" position regarding the state's proposed twin tunnels project in the Bay-Delta. While MWD is the state's leading advocate for the project, the Water Authority's board of directors has not taken a position on whether to support or oppose the project. Instead, we have posed serious questions, particularly about the how the project would be funded. Our four delegates to the MWD board voted against the recent purchase of Delta islands because it was — among other reasons — an unbudgeted expense with unknown liabilities and an unclear purpose that could become an albatross if no legitimate use for the property emerges in the coming years.

For the good of both our regions and our state, let's not lose sight of our shared interests in a safe and reliable water supply.

Mark Weston is chair of the San Diego County Water Authority's board of directors. He wrote this for the Mercury News.

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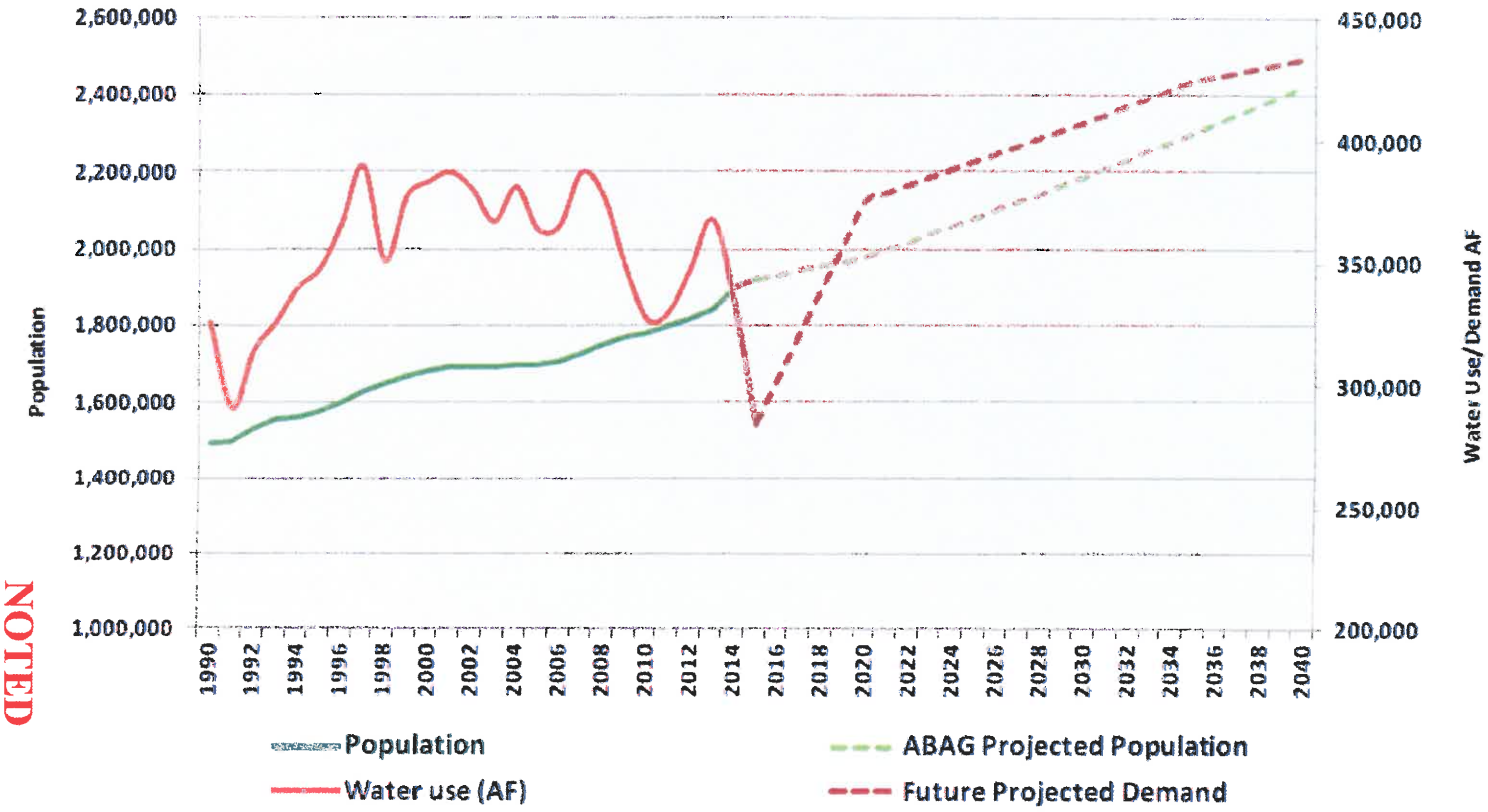
2015 Urban Water Management Plan Projections

SCVWD

Figure 4-5. Historic Water Use and Estimated Future Use



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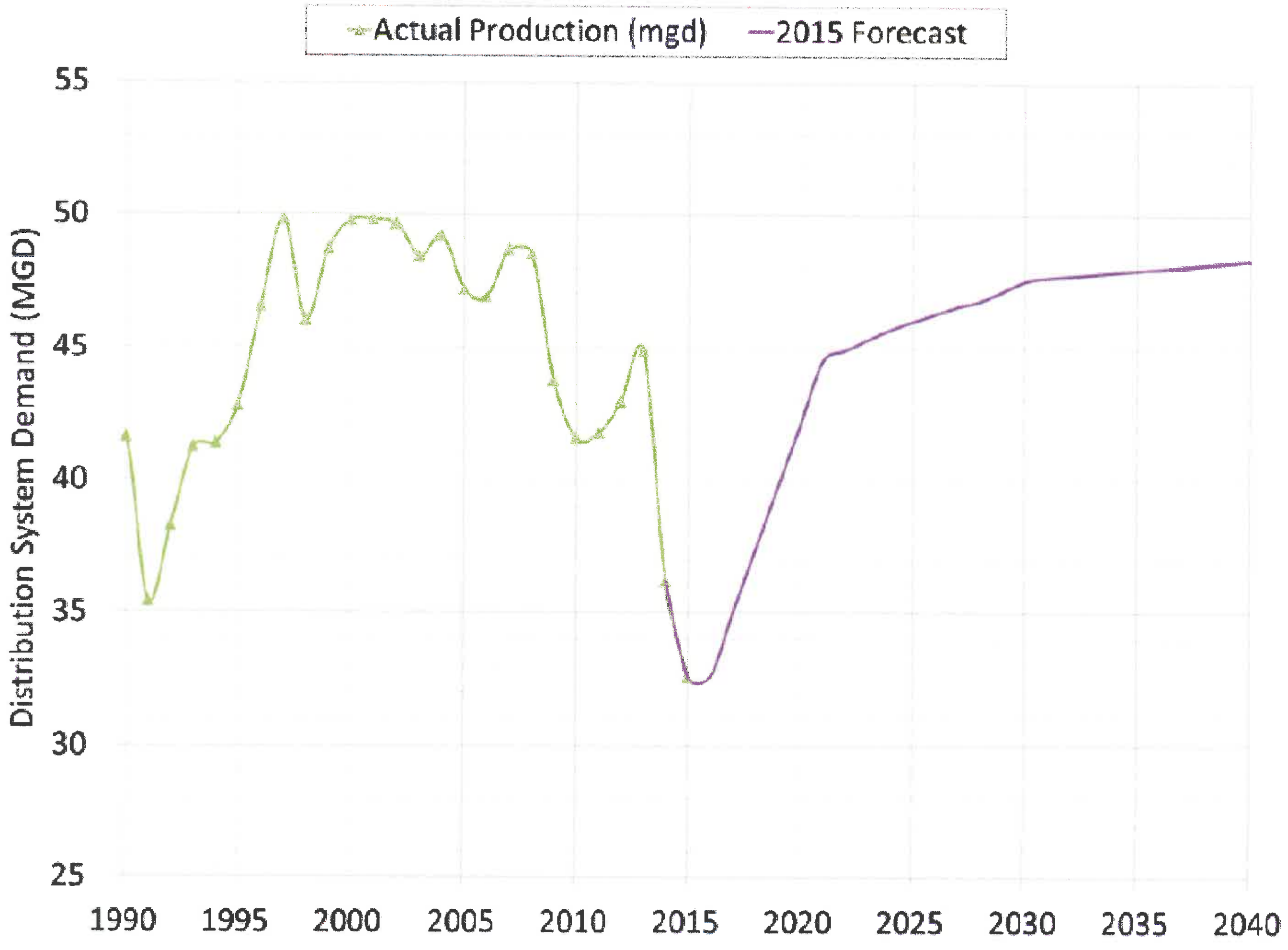
Page 1 of 3

ACWD

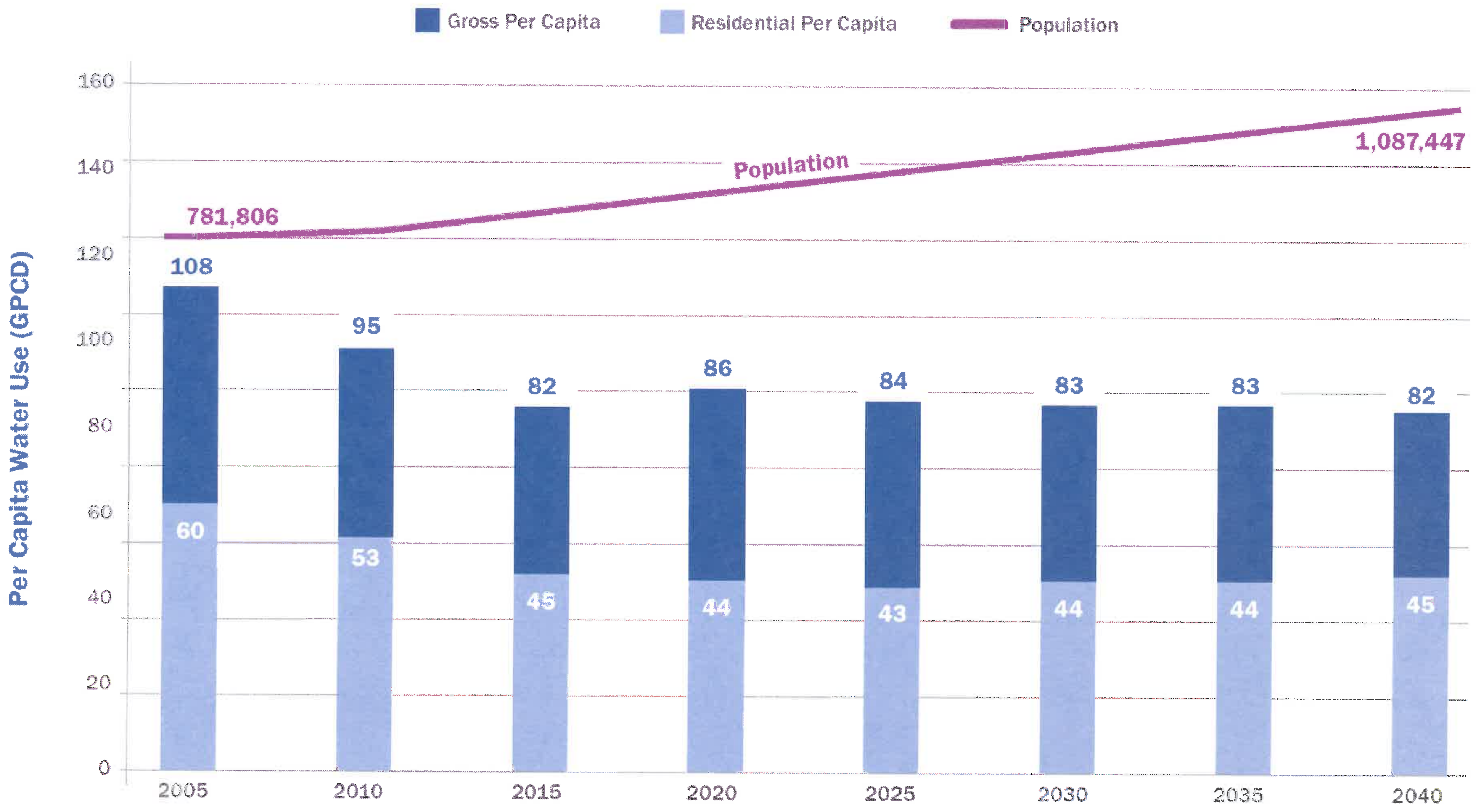
Figure 2-3. Historical and Projected Distribution System Demands (with Additional Conservation Savings and Non-Revenue Water)

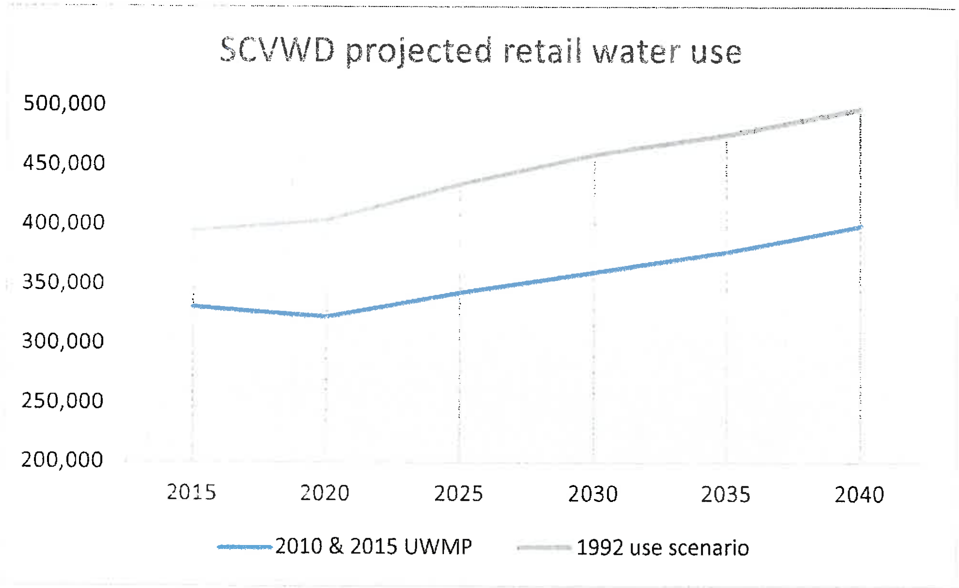


SFPUC

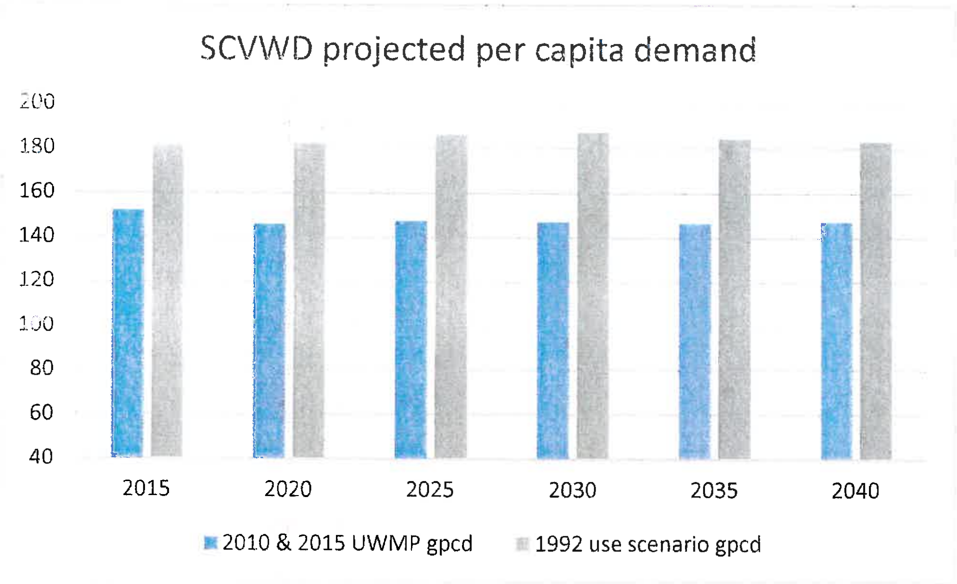
Figure 5-1. Historic and Projected Per Capita Water Use

PUBLIC REVIEW DRAFT | 2015 Urban Water Management Plan for the City and County of San Francisco, pg. 5-6.





Total projected water use for retail agencies



Assuming ABAG projected population

Santa Clara Valley
Water District

Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118-3686
Phone: (408) 265-2600   Fax: (408) 266-0271
www.valleywater.org