BOARD MEETING AGENDA
REGULAR MEETING OF THE BOARD OF DIRECTORS OF
CITRUS HEIGHTS WATER DISTRICT (CHWD)
SEPTEMBER 19, 2018 beginning at 6:30 PM

DISTRICT ADMINISTRATIVE OFFICE
6230 SYLVAN ROAD, CITRUS HEIGHTS, CA

In compliance with the Americans with Disabilities Act, if you have a disability and need a disability-related modification or accommodation to participate in this meeting, please contact the General Manager at (916) 725-6873. Requests must be made as early as possible, and at least one full business day before the start of the meeting.

CALL TO ORDER:

Upon request, agenda items may be moved to accommodate those in attendance wishing to address that item. Please inform the General Manager.

ROLL CALL OF DIRECTORS:

PLEDGE OF ALLEGIENCE:

VISITORS:

PUBLIC COMMENT:

The Public shall have the opportunity to directly address the Board on any item of interest to the public before or during the Board's consideration of that item pursuant to Government Code Section 54954.3. Public comment on items of interest within the jurisdiction of the Board is welcome. The Presiding Officer will limit comments to three (3) minutes per speaker.

(A) Action Item (D) Discussion Item (I) Information Item

CONSENT CALENDAR: (I/A)

All items under the Consent Calendar are considered to be routine and will be approved by one motion. There will be no separate discussion of these items unless a member of the Board, Audience, or Staff request a specific item be removed for separate discussion/action before the motion to approve the Consent Calendar.

CC-1a. Minutes of the Special Meeting – August 8, 2018
CC-1b. Minutes of the Special Meeting – August 15, 2018
CC-1c. Minutes of the Regular Meeting – August 15, 2018
CC-1d. Minutes of the Special Meeting – September 5, 2018
CC-2. Revenue Analysis Report for August 2018
CC-3. Assessor/Collector's Roll Adjustment for August 2018
CC-4. Treasurer's Report for August 2018
CC-5. Treasurer's Report of Fund Balances for August 2018
CC-6. Operations Budget Analysis for August 2018
CC-7. Capital Projects Summary August 2018
CC-8. Warrants for August 2018
CC-9. CAL–Card Distributions for August 2018
CC-10. Summary of 2018 Employees and Directors Training Courses, Seminars and Conference
CC-11. Employee Recognitions

CC-12. Long Range Board Agenda (I)
Board Agenda Items Planned for Upcoming Meetings.

CC-13. Engineering Department Report (I)
Significant assignments and activities for the Engineering Department are summarized.

CC-14. Operations Department Report (I)
Monthly report on construction and maintenance activities.

CC-15. 2018 Water Supply – Purchased and Produced (I)
Report on annual water supply including comparison with prior years.

CC-16. Water Supply Reliability (I)
Receive status report on surface water supplies available to the Citrus Heights Water District (District).

CC-17. Water Efficiency and Safety Program Update (I)
Monthly report on Water Efficiency program activities.

CC-18. Discussion and Possible Action to Consider Acceptance of Completion of Graham Circle and Circuit Drive Water Main Replacement Project (A)
Consider adoption of Resolution 14-2018 accepting the Graham Circle and Circuit Drive Water Main Replacement Project, and authorize execution and recording of a Notice of Completion for the Project.

CC-19. Discussion and Possible Action to Approve the American River Basin Integrated Regional Water Management Plan (A)
Consider approval of Resolution 15-2018 for the approval of the American River Basin Integrated Regional Water Management Plan.

CC-20. Discussion and Possible Action to Approve a Professional Services Agreement for Information Technology Services (A)
Consider approval of an agreement with Glenn Wolfe for IT Services.

CC-21. Discussion and Possible Action to Approve an Agreement to Prefund Other Post-Employment Benefits through the CalPERS California Employers' Retiree Benefit Trust Program (A)

1. Consider approval of an agreement with CalPERS to Prefund Other Post-Employment Benefits through CERBT;
2. Adopt Resolution 16-2018 delegating authority to request disbursements from the Trust; and
3. Authorize the General Manager to execute any necessary documents with CalPERS to fund and maintain participation in the trust.

PRESENTATIONS:

None.

STUDY SESSIONS:

S-1. Project 2030 Water Main Replacement Study 30% Completion Update (I/D)

Receive an update on the Project 2030 Water Main Replacement Study.

BUSINESS:

B-1. Discussion and Possible Action to Fill Vacancies on the Customer Advisory Committee (A)

Consider appointing a replacement to a vacancy on the Customer Advisory Committee, appointing alternates to fill prospective vacancies, and confirming the appointment of Chair and Vice Chair.

B-2. Proposed 2019 Budgets and Water Rate Schedules (A)

Review and discuss the draft Operating and Capital Improvement Budgets and proposed water rate schedule for 2019.

CONSULTANTS' AND LEGAL COUNSEL'S REPORTS (I):

None.

DIRECTOR'S AND REPRESENTATIVE'S REPORTS (I):

D-1. Regional Water Authority (Dains).
D-2. Sacramento Groundwater Authority (Sheehan).
D-3. San Juan Water District (All).
D-4. Association of California Water Agencies (Dains).
D-5. ACWA Joint Powers Insurance Authority (Dains/Castruita).
D-6. City of Citrus Heights (Pieri).
D-7. Chamber of Commerce Government Issues Committee (Gordon/Meurer).
D-8. RWA Lobbying Program Update (Gordon/Meurer).
D-9. Customer Advisory Committee (Riehle/Pieri)
D-10. Other Reports.

MANAGEMENT SERVICES REPORTS (I):

MS-1. Meter Replacement Study Update
MS-2. Water Supply Management Update

CORRESPONDENCE:

None.

FUTURE CHWD BOARD OF DIRECTORS MEETING DATES:

October 17, 2018	6:30 PM	Regular Meeting
November 14, 2018	6:30 PM	Special Meeting
December 5, 2018	6:30 PM	Special Meeting
December 19, 2018	6:30 PM	Regular Meeting

ADJOURNMENT:

CERTIFICATION:

I do hereby declare and certify that this agenda for this Regular Meeting of the Board of Directors of the Citrus Heights Water District was posted in a location accessible to the public at the District Administrative Office Building, 6230 Sylvan Road, Citrus Heights, CA 95610 at least 72 hours prior to the regular meeting in accordance with Government Code Section 54954.2.

Dated: September 13, 2018

Christopher Castruita, Management Services Supervisor/Chief Board Clerk

CITRUS HEIGHTS WATER DISTRICT
BOARD OF DIRECTORS SPECIAL MEETING MINUTES
August 8, 2018

The Special Meeting of the Board of Directors was called to order at 6:02 p.m. by President Riehle and roll was called. Present were:

Raymond A. Riehle, President
Caryl F. Sheehan, Vice President
Allen B. Dains, Director

Absent:
None.

Staff: Hilary Straus, General Manager
Susan Sohal, Administrative Services Manager
David Gordon, Operations Manager
Steve Anderson, General Counsel
Josh Nelson, Assistant General Counsel

VISITORS:

None

PUBLIC COMMENT:

None.

CLOSED SESSION:

The meeting convened into Closed Session at 6:03 pm to discuss the following items as listed on the Closed Session Regular Meeting Agenda:

CL-1. Pursuant to Section 54956.8:
CONFERENCE WITH REAL PROPERTY NEGOTIATORS
Property: Parcel Number 211-0192-087-0000
Agency negotiators: David Gordon, Josh Nelson, Hilary Straus, Susan Sohal
Negotiating parties: First Apostolic Church Incorporated of Citrus Heights
Under negotiation: Both Price and Terms of Payment

CL-2. Pursuant to Section 54956.9:
CONFERENCE WITH LEGAL COUNSEL—ANTICIPATED LITIGATION
Initiation of litigation pursuant to paragraph (4) of subdivision (d) of Section 54956.9: 1 case

The Closed Session was adjourned at 8:42 pm.

No reportable action.

ADJOURNMENT:

There being no other business to come before the Board, the meeting was adjourned at 8:43 pm.

APPROVED:

_____	_____
HILARY STRAUS Secretary Citrus Heights Water District	RAYMOND A. RIEHLE, President Board of Directors Citrus Heights Water District

CITRUS HEIGHTS WATER DISTRICT
BOARD OF DIRECTORS SPECIAL MEETING MINUTES
August 15, 2018

The Special Meeting of the Board of Directors was called to order at 6:00 p.m. by President Riehle and roll was called. Present were:

Raymond A. Riehle, President
Caryl F. Sheehan, Vice President
Allen B. Dains, Director

Absent:
None.

Staff: Hilary Straus, General Manager
Susan Sohal, Administrative Services Manager
David Gordon, Operations Manager
Melissa Pieri, Engineering Manager/District Engineer
Chris Castruita, Management Services Supervisor/Chief Board Clerk
Steve Anderson, General Counsel
Josh Nelson, Assistant General Counsel

VISITORS:

None

PUBLIC COMMENT:

None.

CLOSED SESSION:

The meeting convened into Closed Session at 6:00 pm to discuss the following items as listed on the Closed Session Regular Meeting Agenda:

CL-1. Pursuant to Section 54956.9:
CONFERENCE WITH LEGAL COUNSEL—ANTICIPATED LITIGATION
Initiation of litigation pursuant to paragraph (4) of subdivision (d) of Section 54956.9: 1 case

The Closed Session was adjourned at 6:25 pm.

No reportable action.

ADJOURNMENT:

There being no other business to come before the Board, the meeting was adjourned at 6:26 pm.

APPROVED:

_____	_____
CHRISTOPHER CASTRUITA	RAYMOND A. RIEHLE, President
Deputy Secretary	Board of Directors
Citrus Heights Water District	Citrus Heights Water District

CITRUS HEIGHTS WATER DISTRICT
BOARD OF DIRECTORS REGULAR MEETING MINUTES
August 15, 2018

The Regular Meeting of the Board of Directors was called to order at 6:33 p.m. by President Riehle and roll was called. Present were:

Raymond A. Riehle, President
Caryl F. Sheehan, Vice President
Allen B. Dains, Director

Absent:
None.

Staff:
Hilary Straus, General Manager
Susan Sohal, Administrative Services Manager
David Gordon, Operations Manager
Missy Pieri, Engineering Manager
Chris Castruita, Management Services Supervisor/Chief Board Clerk
Alberto Preciado, Senior Accountant
Madeline Henry, Management Services Specialist/Deputy Board Clerk
Rex Meurer, Water Efficiency Supervisor

VISITORS:

David Wheaton
Josette Reina-Luken

PLEDGE OF ALLEGIANCE:

Board President Raymond Riehle led the Pledge of Allegiance.

PUBLIC COMMENT:

None.

CONSENT CALENDAR:

President Riehle asked for consideration and/or approval of the Consent Calendar, consisting of the following action or information items:

Minutes of the Special Meeting – July 17, 2018
Minutes of the Special Meeting – July 18, 2018

Minutes of the Regular Meeting – July 18, 2018
Revenue Analysis Report for July 2018
Assessor/Collector's Roll Adjustment for July 2018
Treasurer's Report for July 2018
Treasurer's Report of Fund Balances for July 2018
Operations Budget Analysis for July 2018
Capital Projects Summary July 2018
Warrants for July 2018
CAL–Card Distributions for July 2018
Summary of 2018 Employees and Directors Training Courses, Seminars and Conferences
Employee Recognitions

Long Range Board Agenda (I)

Board Agenda Items Planned for upcoming Meetings.

Engineering Department Report (I)

Significant assignments and activities for the Engineering and Capital Projects Department are summarized.

Operations Department Report (I)

Monthly report on construction and maintenance activities.

2018 Water Supply – Purchased and Produced (I)

Report on annual water supply including comparison with prior years.

Water Supply Reliability (I)

Receive status report on surface water supplies available to the Citrus Heights Water District (District).

Water Efficiency and Safety Program Update (I)

Monthly report on Water Efficiency and Safety programs activities.

Discussion and Possible Action to Authorize Administrative Services and Water Efficiency Staff to Attend Conferences and Trainings (A)

Consider authorizing the Principal Information Technology Analyst and Management Services Specialist to attend the Harris Customer Training Conference, and authorizing the Senior Water Efficiency Specialist and Water Efficiency Technician to attend the 2018 N-Gage Water Meter School. Consider authorizing the General Manager to approve expenses related to conference/training attendance.

Discussion and Possible Action to Approve Proposal for IT Infrastructure Upgrade

Consider approving the proposal from J4 Systems for the network infrastructure and server upgrade authorized in the 2018 budget and part of the 2018 Strategic Plan.

Discussion and Possible Action to Approve a Letter Opposing State of California Senate Bill 998

Consider authorizing the General Manager to issue a letter in opposition to Senate Bill 998 (Dodd).

JULY 2018 WARRANTS

CHECK	PAYEE	DESCRIPTION	AMOUNT
65808	Karel/Miluse Mojzis	Customer Refund	$247.96
65809	James M White	Customer Refund	$32.16
65810	ABA DABA Rentals & Sales	Supplies-Field	$256.56
65811	Best Best & Krieger	Legal & Audit	$7,259.54
65812	Burketts	Office Expense	$33.96
65813	2014-1 IH Borrower	Customer Refund	$70.89
65814	Express Office Products Inc	Office Expense	$34.78
65815	FP Mailing Solutions	Equipment Rental- Office	$181.76
65816	Government Finance Officers Association	Dues & Subscriptions	$370.00
65817	J4 Systems	Support Services	$3,403.75
65818	Kei Window Cleaning #12	Janitorial	$94.00
65819	Kiwanis of Citrus Heights	Continued Education	$452.00
65820	Liebert Cassidy Whitmore	Legal & Audit	$2,425.00
65821	Moonlight BPO	Support Services	$3,749.69
65822	Pace Supply Corp	Material	$546.46
65823	Red Wing Shoe Store	Small Tools	$803.08
65824	Republic Services #922	Utilities	$357.78
65825	Sac-Val Janitorial Supply	Supplies-Field	$229.60
65826	Les Schwab Tires	Repair-Trucks	$185.60
65827	Union Bank Trust Department-Fees	Small Office Equip	$270.15
65828	Best Best & Krieger	Legal & Audit	$15,665.00
65829	Central Valley Engineering & Asphalt, Inc.	Support Services	$26,708.38
65830	CirclePoint	Support Services	$14,935.73
65831	Ferguson Enterprises Inc #1423	Material	$12,214.54
65832	Miles Treaster & Associates	Office Expense	$25,195.58
65833	Regional Water Authority	Dues & Subscriptions	$25,614.00
65834	Sacramento Groundwater Authority	Dues & Subscriptions	$33,977.00
65835	SMUD	Utilities	$8,226.71
65836	Regional Water Authority	Dues & Subscriptions	$43,579.00
65837	Floyd M/Deloris R Norris	Customer Refund	$105.93
65838	Carol J Lymath Family Trust	Customer Refund	$92.32

JULY 2018 WARRANTS

CHECK	PAYEE	DESCRIPTION	AMOUNT
65839	Mark C/Jeanne Pickett	Customer Refund	$14.03
65840	Gerald L Houseman	Customer Refund	$23.77
65841	Walter L/Janet S Nichols	Customer Refund	$65.68
65842	Rodney J/Donna M Vanbebber	Customer Refund	$11.95
65843	Rodger C/Carol M Leever Trust	Customer Refund	$18.36
65844	Michael L Kasjaka estate	Customer Refund	$81.34
65845	Regina C Hansen	Customer Refund	$60.21
65846	John M/Trudy C Rua	Customer Refund	$53.60
65847	Frank D/Marian J Janicik	Customer Refund	$53.18
65848	Krzysztof/Maria Bilski	Customer Refund	$71.76
65849	Zachary N/Chelsea A McKiernan	Customer Refund	$134.65
65850	Timothy R/Karla M Quadro	Customer Refund	$104.53
65851	Marvin / R Stark Family Trust	Customer Refund	$38.67
65852	Erlinda Sabino	Customer Refund	$8.86
65853	Kelsey Nosworthy	Customer Refund	$231.36
65854	Lorne Green	Customer Refund	$174.95
65855	Carrington Mortgage Services LLC	Customer Refund	$190.35
65856	AFLAC	Employee Paid Insurance	$395.99
65857	AIA Services, LLC/NDS	Water Conservation-Material/Supplies	$3,809.56
65858	Robin Cope	Health Insurance	$422.30
65859	Corix Water Products, Inc	Material	$1,264.99
65860	Cybex	Equipment Rental- Office	$158.16
65861	Express Office Products Inc	Office Expense	$28.15
65862	Ferguson Enterprises Inc #1423	Material	$1,023.63
65863	Indoor Environmental Services	Maintenance Agreement-Equipment	$374.53
65864	Integrity Administrators Inc	Health Insurance	$318.50
65865	KBA Docusys Inc	Equipment Rental- Office	$342.63
65866	Rex Meurer	Water Conservation-Material/Supplies	$190.85
65867	OCT Academy	Continued Education	$390.00
65868	Office Depot	Office Expense	$245.04
65869	RW Trucking	Support Services	$1,763.75
65870	Sonitrol	Equipment Rental- Office	$175.10
65871	S.I.C.H.	Office Miscellaneous	$420.00

JULY 2018 WARRANTS

CHECK	PAYEE	DESCRIPTION	AMOUNT
65872	Spot on Signs & Graphics	Support Services	$1,639.49
65873	State Water Resources Control Board	Dues & Subscriptions	$60.00
65874	Sylvan Trailer & Supply	Repair-Trucks	$1,600.00
65876	Lynne A Clair	Customer Refund	$15.86
65877	Garth L Freeman	Customer Refund	$40.42
65878	Ryan Ross	Customer Refund	$97.24
65879	James M Mazzarelli	Customer Refund	$165.56
65880	Leonardo J Guimoye	Customer Refund	$13.48
65881	Alimasi Buxilaji	Customer Refund	$284.28
65882	Denae/Nathaniel A Castillo	Customer Refund	$69.32
65883	Hagen Lendewig	Customer Refund	$144.29
65884	Samboo Inc.	Customer Refund	$68.88
65885	Richard L/Jeanette C Abbott	Customer Refund	$381.54
65886	A&A Stepping Stone Manufacturing	Supplies-Field	$29.61
65887	ABA DABA Rentals & Sales	Supplies-Field	$262.86
65888	Alexander's Contract Services	Support Services	$1,858.57
65889	Bob Anderson	Field Miscellaneous	$25.80
65890	AnswerNet	Telephone-Answer Service	$287.35
65891	AREA Restroom Solutions	Equipment Rentalal-Field	$118.76
65892	Axcient Holdings LLC	Maintenance Agreement-Software	$444.30
65893	Best Best & Krieger	Legal & Audit	$7,820.18
65894	BSK Associates	Water Analysis	$390.00
65895	CirclePoint	Support Services	$7,872.50
65896	City of Citrus Heights	Permit Fees	$770.00
65897	Consolidated	Telephone-Local/Long Distance	$1,728.57
65898	Corelogic Information Solutions Inc	Dues & Subscriptions	$200.00
65899	Corix Water Products, Inc	Material	$142.23
65900	County of Sacramento	Permit Fees	$112.00
65901	Dawson Oil Company	Gas & Oil	$1,778.65
65902	Harris & Associates	Support Services	$5,494.88
65903	J4 Systems	Support Services	$572.50
65904	KBA DOCUSYS	Equipment Rental- Office	$402.03
65905	Lords Electric Inc.	Support Services	$5,000.00
65906	Moonlight BPO	Support Services	$4,890.59

JULY 2018 WARRANTS

CHECK	PAYEE	DESCRIPTION	AMOUNT
65907	Occu-Med	Office Miscellaneous	$16.00
65908	Office Depot	Office Expense	$82.67
65909	Pace Supply Corp	Material	$3,211.16
65910	ReScape California	Support Services	$2,500.00
65911	John Sullivan	Customer Refund	$113.63
65912	SureWest Directories	Telephone-Local/Long Distance	$49.00
65913	Borey Swing	Continued Education	$308.93
65914	Wallace Kuhl & Associates Inc	Support Services	$2,685.00
65915	WaterWise Consulting, Inc	Support Services	$525.00
65916	Warren Consulting Engineers Inc	Support Services	$4,562.50
65917	Suzanne E Ritter 1998 Living Trust	Customer Refund	$18.78
65918	Gary M/Linda R Ellis	Customer Refund	$284.33
65919	Michelle T Toulouse Trust	Customer Refund	$22.93
65920	George W Schaefer	Customer Refund	$7.80
65921	Patricia A Barcal	Customer Refund	$184.42
65922	Darin A//Melissa Hieb	Customer Refund	$8.61
65923	Craig E/April L Johnson	Customer Refund	$33.83
65924	Monique Pelletier	Customer Refund	$262.36
65925	Debora E Roberts	Customer Refund	$24.63
65926	Shad G/Desirae R Schoer	Customer Refund	$21.44
65927	Christina/Shawn Flanary	Customer Refund	$10.01
65928	Doumit Construction Inc	Customer Refund	$1,491.11
65929	ACWA	Dues & Subscriptions	$1,398.00
65930	Afman Supply	Small Tools	$448.41
65931	Airgas USA, LLC	Supplies-Field	$535.13
65932	Alexander's Contract Services	Support Services	$6,724.56
65933	Avalon Custodial Care	Janitorial	$695.00
65934	Awards By Kay Inc	Office Expense	$64.95
65935	Bart/Riebes Auto Parts	Repair-Trucks	$32.30
65936	Best Best & Krieger	Legal & Audit	$7,858.75
65937	BSK Associates	Water Analysis	$1,677.00
65938	California Landscape Associates Inc	Janitorial	$200.00
65939	Grainger	Small Tools	$180.89
65940	Ferguson Enterprises Inc #1423	Material	$767.83

JULY 2018 WARRANTS

CHECK	PAYEE	DESCRIPTION	AMOUNT
65941	Kaiser Foundation Health Plan, Inc	Health Insurance	$24,389.47
65942	Lowe's	Supplies-Field	$212.86
65943	John Miglio	Field Miscellaneous	$145.00
65944	Occu-Med	Office Miscellaneous	$100.00
65945	Pacific Gas & Electric	Utilities	$10.41
65946	Protection One Alarm Monitoring	Equipment Rental- Office	$230.40
65947	Sonsray Machinery, LLC	Fixed Assets	$789.62
65948	TriFresh Technologies, Inc.	Wells Maintenance	$2,032.56
65949	Voyager Fleet Systems Inc	Gas & Oil	$2,273.55
65950	Mae W Walls	Customer Refund	$40.79
65951	Pamela A Slye	Customer Refund	$138.27
65952	Bolin Trust	Customer Refund	$16.99
65953	Haven Properties	Customer Refund	$90.73
65954	Richard Azevedo	Customer Refund	$13.93
65955	Karen K Petersen	Customer Refund	$18.56
65956	Void	Void	$0.00
65957	Bart/Riebes Auto Parts	Repair-Trucks	$129.56
65958	Best Best & Krieger	Legal & Audit	$6,490.31
65959	California Landscape Associates Inc	Janitorial	$200.00
65960	Central Valley Engineering & Asphalt, Inc.	Support Services	$698.75
65961	City of Citrus Heights	Permit Fees	$200.00
65962	Corix Water Products, Inc	Material	$358.81
65963	County of Sacramento	Permit Fees	$724.00
65964	Dawson Oil Company	Gas & Oil	$825.88
65965	Fast Action Pest Control	Support Services	$115.00
65966	Golden State Flow Measurement, Inc	Material	$3,088.55
65967	Harris Industrial Gases	Supplies-Field	$122.81
65968	J4 Systems	Support Services	$1,840.00
65969	Brian A or Caitlin M Kane	Toilet Rebate Program	$150.00
65970	Kei Window Cleaning #12	Janitorial	$96.00
65971	Maze & Associates	Legal & Audit	$3,782.00
65972	Moonlight BPO	Support Services	$7,139.98
65973	Valeriy Pulber	Toilet Rebate Program	$150.00
65974	Red Wing Shoe Store	Small Tools	$1,356.96

JULY 2018 WARRANTS

CHECK	PAYEE	DESCRIPTION	AMOUNT
65975	Regional Water Authority	Dues & Subscriptions	$500.00
65976	Sacramento Suburban Water District	Continued Education	$75.00
65977	Juanita Schultz	Toilet Rebate Program	$75.00
65978	Sophos Solutions	Support Services	$1,200.00
65979	Statewide Traffic Safety and Signs	Supplies-Field	$4,434.14
65980	A. Teichert & Son, Inc.	Road Base	$3,411.04
65981	United Textile	Supplies-Field	$109.58
65982	Underground Service Alert	Dues & Subscriptions	$7,127.88
65983	Priscila B Vital	Toilet Rebate Program	$75.00
65984	Zee Medical Company	Supplies-Field	$165.73
TOTAL			$396,913.16
ACH	AUGUST 2018	Health Insurance	$13,885.21
ACH	GASB 68 PRE PAY	PERS	$404,158.00
ACH	JUNE 2018	Bank Fee	$2,061.65
ACH	JUNE 2018 FD	Bank Fee	$119.98
ACH	JUNE 2018 PH	Bank Fee	$122.77
ACH	JUNE 2018 WB	Bank Fee	$87.98
ACH	JUNE 2018 BOW	Bank Fee	$2,010.04
ACH	LUND CONSTRUCTION 2035-001	Support Services	$55,717.50
ACH	LUND CONSTRUCTION APP #2	Support Services	$210,043.10
ACH	PERS 7/5/18 PAYDAY	PERS	$17,772.46
ACH	UNION BANK JULY 2018	COP Debt Service	$43,047.17
ACH	US Bank I .M.P.A.C Government Services	See July Agenda Item CC:9	$11,716.98
ACH	VALIC 7/26/18 PAYDAY	Deferred Compensation	$2,904.50
ACH	VANCO JUNE 2018	Support Services	$0.28
ACH	PAYCHEX 7/10/18	Support Services	$413.80
ACH	PERS 6/28/18 PAYDAY	PERS	$18,050.62
ACH	VALIC 7/12/18 PAYDAY	Deferred Compensation	$2,904.50
ACH	VOYA 7/12/18 PAYDAY	Deferred Compensation	$25.00
ACH	VOYA 7/26/18 PAYDAY	Deferred Compensation	$25.00
ACH	INVOICE CLOUD JUNE 2018	Bank Fee	$3,978.60
TOTAL			$789,045.14

JULY 2018 WARRANTS

CHECK	PAYEE	DESCRIPTION	AMOUNT
GRAND TOTAL			$1,185,958.30

August Payments Approved at August Board Meeting

ACH	LUND CONSTRUCTION 2031-RET	Support Services	$18,899.23
ACH	LUND CONSTRUCTION 2035-003	Support Services	$209,580.16
ACH	US Bank I.M.P.A.C Government Services	See August Agenda Item CC:9	$12,557.08
65991	MP Nexlevel of California, Inc	Support Services	$8,720.78
65989	Ferguson Enterprises Inc #1423	Material	$9,630.00
65993	SMUD	Utilities	$16,323.43
65986	B&M BUILDERS	Support Services	$20,239.38
65985	ACWA/JPIA	Workers Comp Insurance	$21,781.71
65990	HANLEES CHRYSLER DODGE	Fixed Assets	$35,890.85
65992	SAN JUAN WATER DISTRICT	Purchased Water	$694,483.41
TOTAL			$1,048,106.03

Employee Recognitions— Eighteen employees received recognition for attendance during June 2018, and twenty-five were recognized for outstanding customer service and quality of work during the month of July 2018. Directors were provided with a list of the employees and items for which each received recognition.

The Long Range Board Agenda was provided showing Directors upcoming items for future scheduled Board Meetings.

Engineering Department Report

The Engineering and Capital Projects Department staff presented a report on the following activities during the month of August 2018.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PROJECT 2030 Water Main Replacement Project	Engineering	Engineering Manager and Project Manager	On-going	Yes, 09/19/18 (30% Completion Update)	Yes	2017-2018 Masterplan for replacement of mains installed in 1960-1985.	Asset Inventory and water demand projections in progress. CAC Workshop #2 scheduled for 08/28/18. 30% Presentation to the Board at the September Board Meeting.
CAPITAL IMPROVEMENT PROJECT Corporation Yard / Facilities Master Plan Buildout	Engineering	Engineering Manager and Project Manager	On-going	Yes, TBD	Yes	2017-18 Masterplan for office space requirements through 2040.	Staff continues to review Space Needs Assessment completed by consultant. Additional meetings scheduled with the goal of presenting to the Board in Q4 2018.
CAPITAL IMPROVEMENT PROJECT Highland Ave & Rosa Vista Ln 8" Water Mains	Engineering	Senior Construction Inspector and Project Manager	On-going	Yes, 06/20/18 (Notice of Completion) 09/19/18 or 10/17/18 (Easements)	Yes	2017 design and construction.	Award of Contract occurred at the 01/17/18 Board Meeting. Notice of Completion approved at 06/20/18 Board Meeting. Easements being prepared by District. Anticipate bringing to the Board at the September/October Board Meeting.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
CAPITAL IMPROVEMENT PROJECT Graham Cir and Circuit Dr 8" Water Mains	Engineering	Senior Construction Inspector and Project Manager	On-going	Yes, 04/18/18 (Award of Contract) Yes, 09/19/18 (Notice of Completion)	Yes	2017 design, 2018 construction.	Contract signed and work began on 05/21/18. 99% Complete. Contractor completing punch list items. Notice of Completion anticipated to be brought to the Board at the September Board Meeting.
CAPITAL IMPROVEMENT PROJECT Wind Way and Longwood Way 8" Water Mains	Engineering	Project Manager and Assistant Engineer	On-going	Yes, TBD	Yes	2017 design, 2018 construction.	Received response from Division of Drinking Water on 07/30/18. Awaiting response from City of Citrus Heights. Prepare final plans.
CAPITAL IMPROVEMENT PROJECT Pleasant View Drive 8" Water Main	Engineering	Project Manager and Assistant Engineer	On-going	Yes, TBD	Yes	2017 design, 2018 construction.	Plans sent to Engineer on 05/01/18. Potholing to be scheduled for August 2018.
CAPITAL IMPROVEMENT PROJECT Michigan Drive 8" & 6" Water Mains	Engineering	Project Manager and Assistant Engineer	On-going	Yes, TBD	Yes	2017 design, 2018 construction.	Plans sent to Engineer on 05/02/18. Potholing completed. Preparing 90% plans. Staff to verify easements.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
CAPITAL IMPROVEMENT PROJECT 6230 Sylvan Road East Side Wall	Engineering	Project Manager and Assistant Engineer	On-going	Yes, TBD	No	Wall along the east side of District property.	We anticipate this project will be included in the 2019 Capital Improvement Program. Staff to begin communication with SJUSD during 2018.
PRIVATE DEVELOPMENT Northridge Grove - 5555 Mariposa Ave 47 Condominiums	Engineering	Senior Construction Inspector and Engineering Manager	On-going	Yes, TBD	No	Private development.	District met on 03/01/18. District sent cost-sharing agreement for system improvements made in conjunction with the project on 05/23/18. District to respond.
PRIVATE DEVELOPMENT Dignity Health Building - 7115 Greenback Ln	Engineering	Engineering Manager and Senior Construction Inspector	On-going	Yes, TBD	No	Medical office building by developer.	Project complete. Perform project closeout. District to review draft easement received from the City of Citrus Heights on 08/01/18.
PRIVATE DEVELOPMENT 3 lot Residential Subdivision - 5648-5696 San Juan Ave	Engineering	Senior Construction Inspector	On-going	No	No	3 lot subdivision.	Preconstruction meeting occurred on 03/12/18. Construction in progress. 75% Complete.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT Mitchell Farms - 7925 Arcadia Drive	Engineering	Engineering Manager and Assistant Engineer	On-going	Yes, TBD	No	200-300 unit development by Watt Communities.	District submitted Conditions of Approval for the project on 05/07/18. Engineer preparing Improvement Plans for proposed land exchange.
PRIVATE DEVELOPMENT Mariposa Creek Subdivision - Antelope Road	Engineering	Senior Construction Inspector and Engineering Manager	On-going	No	No	15 lot subdivision located on Antelope Road.	Final plans received on 01/23/18. Developer grading site. Water preconstruction meeting occurred on 06/25/18. 70% Complete.
PRIVATE DEVELOPMENT Citrus Place Subdivision	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	7 lot subdivision located near Wachtel Way & Talbot Way.	Received updated plans from engineer on 04/30/18. District sent back comments on 05/22/18. Awaiting a resubmittal.
PRIVATE DEVELOPMENT 7581 Sycamore Dr - Parcel Split 1 - 3	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Parcel being split into 3 for 3 home subdivision.	Engineer submitted revised plans on 03/22/18. Comments sent to engineer on 04/04/18. Resubmittal received on 05/02/18. Comments sent to engineer on 06/04/18.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT 8053 Holly Dr - Parcel Split 1 - 3	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Parcel being split into 3 for 3 home subdivision.	Final plans signed and fees received on 05/10/18. Awaiting final plans.
PRIVATE DEVELOPMENT Sunrise Blvd_5437-5439 - Sunrise Village Retail Center - parcel split	Engineering	Engineering Manager and Assistant Engineer	On-going	TBD	No	Parcel being split into 3 for individual sales that previously occurred.	Sent comments to City 09/13/17. Awaiting to determine if developer/ owner chooses to split the parcel.
PRIVATE DEVELOPMENT 7601 Sunrise Blvd The Human Bean	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development.	District signed plans on 12/21/17. Awaiting construction.
PRIVATE DEVELOPMENT 6920 Auburn Blvd Stock Ranch Plaza - Parcel 11	Engineering	Senior Construction Inspector	On-going	No	No	Commercial Development.	Received easement information on 11/30/17. Signed plans on 02/26/18. Preconstruction meeting on 04/30/18. Awaiting easements for entire Stock Ranch area.
PRIVATE DEVELOPMENT 7030 Auburn Blvd Stock Ranch - Traffic Circulation	Engineering	Senior Construction Inspector	On-going	No	No	Commercial Development.	Plans signed on 02/26/18. Fees paid on 05/22/18. 95% Complete. Awaiting easements for entire Stock Ranch area.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT 7766 Auburn Blvd Quick Slice	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development.	Sent comments to City on 11/27/17. Awaiting final plans from developer for District review.
PRIVATE DEVELOPMENT 6199 Sunrise Blvd US Bank Parcel Split	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development.	Sent Will Serve letter on 12/27/17. Awaiting to determine if developer/ owner chooses to split the parcel.
PRIVATE DEVELOPMENT 8501 Auburn Blvd Big Lots	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development.	Sent Will Serve letter on 05/23/18. Received 2nd submittal for review on 07/25/18. District sent review comments on 08/03/18. Review easements for project.
PRIVATE DEVELOPMENT 8501 Auburn Blvd Studio Movie Grill	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development.	Sent Will Serve letter on 12/28/17. Awaiting plans from developer for District review. Review easements for project.
PRIVATE DEVELOPMENT 7312 Veterans Lane	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Single Family Home on a private street.	Sent review comments on 08/03/18. Awaiting revised plans.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
COMCAST	Engineering	Assistant Engineer and GIS Specialist	On-going	No	No	Various communicatio ns boring projects throughout the service area.	District has provided water utility maps for all requested projects. Awaiting resubmittal from Comcast Engineer. Awaiting as-builts on all completed projects.
CITY OF CITRUS HEIGHTS PROJECT City Drainage Project	Engineering	Engineering Manager and Assistant Engineer	On-going	Yes, TBD	Yes	Highland Ave, Wonder St, Dana Butte Way, and Sunhill Dr Storm Drain Project.	Anticipate bid and start of construction in Summer 2018. "B" Plans sent back 08/21/17 with comments. Coordinating utility conflicts and possible easement.
CITY OF CITRUS HEIGHTS PROJECT Bonita, Old Auburn Rd, & Mariposa Ave Storm Drain Improvements	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Bonita Way, Old Auburn Road, & Mariposa Ave Storm Drain Project.	Received 30% plans at the meeting with Dokken Engineering on 05/21/18. District sent engineer data on 08/03/18.
CITY OF CITRUS HEIGHTS PROJECT Baird Way Storm Drain Improvements	Engineering	Operations and Senior Construction Inspector	On-going	Yes, TBD	Yes	Baird Way Storm Drain Project.	Construction complete by City contractor. This item is complete.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
CITY OF CITRUS HEIGHTS PROJECT Sunrise Blvd Complete Streets Phase 2A (C16-142)	Engineering	Operations and Senior Construction Inspector	On-going	Yes, TBD	Yes	Frontage improvements along west side of Sunrise from Sayonara to north and Storm Drain Improvements.	Attended preconstruction meeting on 03/14/18. Construction in progress by City contractor. CHWD 60% complete with water facility relocations. Need to coordinate valve raising with contractor.
CITY OF CITRUS HEIGHTS PROJECT Mariposa Ave - Safe Routes to School Phase III	Engineering	Engineering Manager and Assistant Engineer	On-going	Yes, TBD	Yes	Frontage improvements along west side of Mariposa Ave from Northridge to Eastgate.	Received signed Utility Agreement. Start of construction in Summer 2018. Received plans for review on 05/17/18. Pre-bid meeting on 06/05/18. District awaiting final plans.
CALIFORNIA DEPT OF TRANSPORTATION Weigh Station at I-80 & Antelope	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Weigh station and off-ramp Improvements.	Sent water facility maps and as-builts to Engineer on 11/20/17. Awaiting plans from CalTrans for District review.
Annexations	Engineering	Engineering Manager, Project Manager and Assistant Engineer	2018	Yes, TBD	Yes	Annex properties into the District to clarify and revise District boundaries.	Staff conducted an initial scoping meeting in April. Staff is now working on a draft RFP for consultant services. A follow-up meeting is scheduled for 08/08/18.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
Easements	Engineering	Engineering Manager, Project Manager and Assistant Engineer	2018	Yes, TBD	Yes	Research and review District facility locations and easements for potential additions/ revisions.	Staff conducted an initial scoping meeting in April. Staff is now working on a draft RFP for consultant services. A follow-up meeting is scheduled for 08/08/18.

Operations Department Report

Operations Manager Gordon reported as follows:

A total of 70 work orders were performed during the month of July by field operations crews, administration field crews and contractors. The results of recent bacteriological testing, a total of 90 samples, have met all California Department of Drinking Water (DDW) requirements.

2018 Water Supply – Purchased and Produced

The District's total water use during the month of July 2018 (1,737.13 acre-feet) was 24.6 percent below that of July 2013 (2,059.21 acre-feet).

Surface Water Supply Reliability

As of July 1, 2018, storage in Folsom Lake (Lake) was at 630,900 acre-feet, 65 percent of the total capacity of 977,000 acre-feet. This represents an increase in storage of 209,700 acre-feet in the past month.

The District continues to assist with preserving surface water supplies in the Lake by operating its groundwater wells. The District's groundwater production wells: Bonita, Skycrest, and Sylvan, are operational and used on a rotational or as-needed basis. Mitchell Farms, Palm, and Sunrise wells are at various stages of repair.

Water Efficiency Program Update

Water Efficiency, Safety and Meter Program activities during the month of July 2018 include:

- 12 Ultra-Low-Flush Toilet (ULFT) rebates were processed for the month of July. This compares to 12 rebates issued for the month of July 2017. The 5 year average (2013-2017) of June ULFT rebates is 17. A total of $6,450.00 in rebates were issued year to date.

- A total of 7 High Efficiency Clothes Washer (HECW) rebates have been issued during the second quarter of 2018. This compares to 3 HECW rebates issued for the second quarter of 2017. To better align with SMUD's schedule for reporting monthly numbers, staff will report HECW rebates on a quarterly basis.

- 26 water waste calls were received during the month of July. 1 reports of water waste was received through CHWD's Drought Resources web page. A total of 139 services calls were received year to date.

- A WaterSmart class was held on Saturday, July 14 from 9:00 am – 12:00 pm. The class was titled "Picking the Best WaterSmart Plants for Your Landscape & How to Maintain Them". This was the fourth class in a series of 5 classes to be held by the District this year. The next class, titled "Pruning and Maintaining Your WaterSmart Landscape" will be on Thursday September 27 from 6:00 pm – 8:30 pm. Classes are held at the Citrus Heights Community Center located at 6300 Fountain Square Dr.

- Staff began a telephone outreach campaign promoting the District's free Irrigation Efficiency Reviews. WaterWise Consulting is working with staff to contact many of CHWD's high water use customers. WaterWise has completed reaching out to CHWD's single-family customers. Due to this effort, a total of 1 Irrigation Efficiency Review was generated and completed for the month of July. This compares to 11 Irrigation Reviews completed during the same month in 2017. A total of 84 Irrigation Efficiency Reviews have been completed since the outreach campaign began in December 2017. This compares to 37 Irrigation Efficiency Reviews completed for the same time in December 2016 thru July 2017. Staff has shifted the focus of the outreach campaign to Multi-Family customers. For the customers who have completed an Irrigation Efficiency Review during this outreach campaign, staff will conduct a year over year comparison of their water usage. A presentation will be provided to the Board for a complete recap of the findings during the fourth quarter of 2018.

- Staff completed a meter testing program for all meters 3 inch and larger. The testing is part of the Water Loss Program requirement contained in SB555. The meters were tested for accuracy during high, medium and low flow conditions. The testing program was completed on July 17th. Staff is currently analyzing the test results and determining a repair/replacement schedule for failing meters.

- On Thursday, July 12, staff completed the sixth presentation in the annual group participation safety program. The presentation topic was "Smoking Cessation". The presenters included Chris Castruita, Ricky Kelly, and Dan Hesse.

- The following table summarizes the Residential Gallons Per Capita Per Day (R-GPCD) values for CHWD to date:

MONTH	R-GPCD 2017	R-GPCD 2018	% CHANGE
January	75	77	+3%
February	72	85	+18%
March	80	79	-.01%
April	87	100	+13%
May	166	156	-.06%
June	209	213	-.02%
July	241	253	+.05%

- Since 2013, RWA has been providing the District with a recap of the region's individual Agency R-GPCD for the current month/year, including a year to date comparison for 2013. RWA has reformatted the monthly update and will no longer be providing the regional water savings comparison.

Discussion and Possible Action to Authorize Administration Services and Water Efficiency Staff to Attend Conferences and Trainings

Staff requested that the Board consider authorizing Administrative Services and Water Efficiency staff to attend Conferences and Trainings.

The District has set a goal for staff to remain current in their subject-matter field of expertise (i.e., finance/accounting/information technology and water efficiency, respectively), and in general, in professional areas involving technical issues, applicable policies, laws and practices, leadership/organizational skills, and to build and maintain professional networks. At the same time, it has set a goal for management to offer opportunities that will grow and develop employees as they aspire to move up the professional ladder, which also aids in succession planning.

Per District Policy 2060, "Educational and Training Functions," (see Attachment 1), any conference attendance occurring outside the West Coast (California, Nevada, Oregon or Washington) requires Board approval, and any "actual and necessary expenses while in attendance at [these] functions" outside the West Coast "shall require formal approval of the Board of Directors." The Board has the authority to delegate the expense reimbursement authority to the General Manager, should the Board wish to do so, and that authorization is included in the recommended action below.

Funding has been included in the 2018 Operating Budget for two such training opportunities:

1. For two Administrative Services Department staff members, the Principal IT Analyst and the Management Services Specialist assigned to Accounts Receivables/Customer Service, to attend the annual Cogsdale Conference from Oct. 31 to Nov. 2, 2018 in Chicago, Illinois. The conference provides training on the District's finance, accounting, and customer service software system.
2. For two Water Efficiency Division staff members, the Senior Water Efficiency Specialist and Water Efficiency Technician, to attend the annual Meter School training from Nov. 6-8, 2018 in Tallasee, Alabama. The training provides training on the selection, installation, repair, and troubleshooting of District water meters and meter reading systems.

Estimated conference expenses (per attendee) include:

Category:	**Cogsdale Conference**	**Meter School**
Registration Fee	$900	$295
Airfare	$600	$510
Hotel	$750	$390
Non-Airfare Transportation	$80	$300
Meals*	$160	$250
Total	**$2,490**	**$1,745**

*Some, but not all, meals will be included in the conference. For those meals that are not, there will be an additional reimbursable cost. Per District Policy 2060, meals that are expensed are reimbursed at: Breakfast: $20/day; Lunch: $25/day; Dinner: $45/day.

Total expenses per attendee are estimated to be below $2,500/attendee for the Cogsdale Conference, and below $1,800 for the Meter School. Funding is available in the 2018 Continued Education Budget for these requested trainings.

Key Cogsdale Conference breakout sessions include: Customer Service Management (CSM) Road Map , CSM New Features, Great Plains (GP)- What's New, Backflow Management, Month End/Year End Processes, CSM Tips and Tricks, GP – Tips and Tricks, API's, Budget Billing, Collections – Reducing Your Workload, Customer Portals, Customer Communications – Keeping your Customers Informed, Auditing, Bill Template.

Neptune's Meter School is specifically designed to train utility personnel and provide them with the skills to: Size and select meters properly for the application, install meters correctly, repair and test meters as needed, troubleshoot meter and radio endpoints in the field, download and review data logging information to address consumption anomalies. Participation in the 2018 N_GAGE Meter School will provide for 12 (twelve) CEUs. Neptune offers this training program to ensure that water revenue is maximized.

Discussion and Possible Action to Approve Proposal for IT Infrastructure Upgrade

Staff requested that the Board consider approving a proposal for IT Infrastructure upgrade.

The District has long maintained the standard of updating the network server infrastructure every 5 years. The last server infrastructure update was performed in 2013. The next refresh is due this year, 2018. While computer hardware could be pushed to a longer life, the current servers are being replaced for the following:

- The operating system is 10 years old and will be unsupported by Microsoft in 2020.
- Risk of hardware failure begins to increase substantially after 5 years.
- New operating systems require current hardware to operate.
- Our systems require a more current database management system to allow continued upgrades.

The 2018 Strategic Plan and subsequent 2018 budget includes funding for the infrastructure update.

In 2016 the District issued an RFP for IT Support Services. Part of the scope of this RFP was for the selected vendor to provide "advanced planning, implementation and customization where needed and applicable, hardware and software acquisition/disposition and, full range engineering services for network infrastructure". J4 Systems was the selected vendor from this RFP and has been providing services for the District. As such, this current proposal was sole sourced from J4 Systems in accordance to District Policy 6500.16 for Single Source Purchases. As the District's competitively selected IT support services vendor, J4 Systems has extensive knowledge of the District's network and systems, which provides savings in future maintenance and support activities.

District staff has reviewed the proposal and has validated the major hardware items pricing from publicly available vendors to determine fair value of the equipment purchases. In total, the cost of the major items in the proposal are less than the price the District could obtain itself from publicly available sites.

The proposal cost is broken down as follows:

Total of Recommended Products (Hardware/Software)	$42,128.75
Labor Cost for Scope of Work (Services)	$35,660.00
Contingency	$ 7,778.00
TOTAL	$85,566.75

Funds have been budgeted and are available to fund this acquisition through project C17-004A.

Discussion and Possible Action to Approve a Letter Opposing State of California Senate Bill 998

Staff requested that the Board consider approving a Letter opposing State of California Senate Bill 998.

State of California (State) Senate Bill (SB) 998, authored by State Senator Bill Dodd of Napa, proposes to change existing water service shut-off policy. The bill would institute a statewide policy that prevents service shut-offs for a minimum of 60 days for delinquent customers; institutes a cap on fees to reconnect service; and extends the authority of the State Water Resources Control Board and Attorney General to enforce provisions of the bill. In the process, the bill would supersede the Citrus Heights Water District's (CHWD's) current shut-off procedures and reduce the ability of the District to recover costs associated with the physical disconnection and reconnection of water service on delinquent accounts.

In other words, the legislation would result in new unfunded mandates and a loss in local control. Under current CHWD policy, customers who fail to pay their bills and any associated late charges are issued a Notice of Intent to Terminate Water Service (NOIT) at least 30 days after the issuance of the regular bill. The NOIT notifies the customer that they have three (3) business days to make payment or face termination of service. Following the termination of service, a disconnect/reconnect service charge of $104 is placed on the account in order to recover costs associated with processing the termination on the utility billing system, and having two CHWD staff members physically disconnect and reconnect water service at the location of the delinquent account. SB 998 would restrict CHWD

from charging this reconnection fee, and instead require that the service fee be set at a maximum of $50. By disallowing CHWD from charging the delinquent customer the full cost of disconnection and reconnection, it would have the unintended effect of shifting those unrecovered costs onto other customers.

The Association of California Water Agencies (ACWA) strongly opposes the proposed new regulations. ACWA encourages member agencies to notify their local state representatives of similar positions of opposition.

Should the Board authorize the General Manager to issue the letter in opposition to SB 998, staff stated they would distribute the letter to the Chair of the Assembly Appropriations Committee, Assembly Member Lorena Gonzalez Fletcher of San Diego, who at that time was reviewing the bill in advance of making a determination as to whether to submit it to the Assembly floor for a vote. In addition, staff would circulate the letter to the State representatives who represent the CHWD service territory.

ACTION: Director Dains moved and Director Sheehan seconded a motion to accept the Consent Calendar.

The motion carried 3-0 with all Directors voting yes.

PRESENTATIONS:

None.

STUDY SESSIONS:

Other Post-Employment Benefits Trust Presentation

Senior Accountant Preciado asked the Board to consider a presentation on the California Public Employers' Retirement System (CalPERS) concerning the Other Post-Employment Benefit (OPEB) Trust, known as the California Employers' Retiree Benefit Trust Fund (CERBT). Senior Accountant Preciado stated that this trust is being considered as an option for the accelerated payoff of the District's OPEB unfunded actuarial liability (UAL), as authorized by the Board in the 2018 Adopted Budget.

He introduced Matt Goss of CalPERS, who discussed the benefits of this program as part of the implementation of the Governmental Accounting Standards Board (GASB) Statement Number 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*.

Board Member Riehle asked if anyone has reached out to other agencies to see if CalPERS staff provide good customer service. Senior Accountant Preciado stated that he had spoken to professional contacts who had only positive feedback. Board Member Riehle asked if staff had reached out to other local water agencies to see if any have contracted with CalPERS. Senior Accountant Preciado stated that he has not, but can reach out to them in the near future.

The Board directed staff via consensus direction to provide this additional information and return at the September Board meeting with a request to prefund Other Post-Employment Benefits through the CalPERS CERBT.

Meter Replacement Study Update

Operations Manager Gordon and Water Efficiency Supervisor Meurer provided an overview of the Request for Proposal (RFP) for the planning study for the Meter Replacement Program, a regional effort being made by a consortium of agencies including CHWD. The RFP is scheduled to be released in late August. Staff described the requested Scope of Services, the Consultant Selection Process, and Schedule in the RFP.

Board Member Riehle asked if the consortium of water agencies intends to issue a press release about the RFP being released and describing the achievement of the consortium. Board Member Sheehan suggested the consortium might consider following through on Board Member Riehle's suggestion once the contract has been awarded to a firm. Board Member Riehle agreed with Board Member Sheehan's suggestion, and General Manager Straus stated that he would inquire with the other consortium member about this at his next opportunity.

Local resident and customer David Wheaton suggested that CHWD consider adding a provision to the RFP disallowing potential respondents from contacting any consortium agency staff member or elected official about the procurement other than the official contacts for the RFP process. He stated that this can prove to be a particular concern in larger communities where vendors are sometimes known for trying to partially circumvent the procurement process in order to obtain a contract with these more political communities. He stated that such a provision would help to protect the integrity of the process. The Board agreed by consensus that staff should endeavor to add such a clause to the RFP prior to issuance.

BUSINESS:

Discussion and Possible Action to Approve the 2019 Strategic Plan

Management Services Supervisor Castruita requested that the Board consider approving the 2019 Strategic Plan. This is the third year that CHWD has engaged in a Strategic Planning process to help shape the development of its annual budget. The goal of Strategic Planning is to bring the Board of Directors and key District staff together to identify and prioritize the District's key policy, program and project issues, and to identify what items, given limited resources (i.e., funding, time and staffing resources) the District should be working on over and above daily operations in the coming year.

The Strategic Planning process includes three major components: 1) Education/Issues Briefing; 2) Team Building; 3) Work Program Development.

The ***Education/Issues Briefing Component*** consisted of a 2018 Strategic Plan Update and Key Issues Briefing by CHWD staff at the May 16, 2018 Regular Board meeting.

The ***Team Building*** and ***Work Program Development*** components took place on July 17, 2018, in a

session attended by the Board of Directors and key District staff, facilitated by Laura Mason-Smith.

Management Services Supervisor Castruita stated that District leadership staff made initial assignments as to who will serve as the Executive responsible for the project, the Project Lead, and who will serve on the Project Team to accomplish each objective. District leadership staff then reviewed the draft Strategic Plan, highlighting several key projects under each of the five goals slated for 2019. Staff expects to update the Board of Directors quarterly or more often as requested.

ACTION: Director Dains moved and Director Sheehan seconded a motion to approve the 2019 Strategic Plan.

The motion carried 3-0 with all Directors voting yes.

CONSULTANTS' AND LEGAL COUNSEL'S REPORTS:

None.

DIRECTORS' AND REPRESENTATIVES' REPORTS:

Regional Water Authority (Dains)
No report.

Sacramento Groundwater Authority (Sheehan)
Board Member Sheehan stated that at the most recent meeting Rob Swartz provided an update on the GSP development, and stated that she wants the plan to be prescriptive as to how the costs will be allocated so that CHWD has certainty as to how it will be billed in future years.

General Manager Straus stated that SGA will be holding their 20 year anniversary since formation on Thursday, October 18 at 11:30 a.m. at the Northridge Country Club. Management Services Supervisor Castruita to confirm details with the Board and to follow up with RWA Administrative Assistant Cecilia Partridge to finalized details.

San Juan Water District (All)
No report.

Association of California Water Agencies (ACWA) (Dains)
General Manager Straus informed the Board that ACWA's Fall Conference will be on November 27-30 in San Diego. Board Member Riehle stated that he was interested in attending the event, and Management Services Supervisor Castruita to confirm details of the trip.

ACWA Joint Powers Insurance Authority (JPIA) (Dains/Castruita)
No report.

City of Citrus Heights (Pieri)
Engineering Manager Pieri stated that the city recently hired a new Assistant Engineer.

Chamber of Commerce Government Issues Committee (Gordon/Meurer)

Management Services Supervisor Castruita informed the Board that he attended the August meeting, and informed the Committee of the recent water conservation legislation passed by the State of California. Staff has developed a one-page handout, which was sent to the Chamber for distribution to members of the public.

Board Member Riehle stated that he will be moderating the Chamber's Citrus Heights City Council Candidates Forum on August 29 at the Citrus Heights Community Center.

RWA Lobbying Program Update (Gordon/Meurer)

Operations Manager Gordon reported that the State's Budget Trailer Bill may be amended for final vote. ACWA hasbeen reaching out to agencies, monitoring the situation, and will notify immediately if they need member agencies to assist with outreach to local legislators.

General Manager Straus informed the Board that RWA will be reopening the recruitment for the position of Legislative Affairs Manager, which was previously held by Adam Robin.

Customer Advisory Committee (Riehle/Pieri)

Engineering Manager Pieri reported that the next Customer Advisory Committee meeting will take place on Tuesday, August 28. In advance of the meeting, staff will meet with Chair Jenna Moser and Vice Chair David Wheaton to review the draft agenda. Chair Jenna Moser and staff will then provide the 30% completion update on the Project 2030 Water Main Replacement Study at the September 19 Board Meeting.

Other Reports

Operations Manager Gordon provided the Board with a brief update on the procurement of potential wells sites.

MANAGEMENT SERVICES REPORT:

None.

CORRESPONDENCE:

None.

FUTURE CHWD BOARD OF DIRECTORS MEETING DATES:

Dates and locations of upcoming Regular Meetings of the Board of Directors were noted for the calendar.

ADJOURNMENT:

There being no other business to come before the Board, the meeting was adjourned at 8:22 pm.

APPROVED:

_____	_____
Christopher Castruita	RAYMOND A. RIEHLE, President
Deputy Secretary	Board of Directors
Citrus Heights Water District	Citrus Heights Water District

CITRUS HEIGHTS WATER DISTRICT
BOARD OF DIRECTORS REGULAR MEETING MINUTES
SEPTEMBER 5, 2018

The Special Meeting of the Board of Directors was called to order at 6:07 p.m. by President Riehle and roll was called. Present were:

Raymond A. Riehle, President
Caryl F. Sheehan, Vice President
Allen B. Dains, Director

Absent:
None.

Staff:
Hilary Straus, General Manager
Susan Sohal, Administrative Services Manager
Chris Castruita, Management Services Supervisor/Chief Board Clerk
David Gordon, Operations Manager
Missy Pieri, Engineering Manager/District Engineer
Rex Meurer, Water Efficiency Supervisor
Alberto Preciado, Senior Accountant

VISITORS:

David Wheaton.

PLEDGE OF ALLEGIANCE:

Board President Riehle led the Pledge of Allegiance.

PUBLIC COMMENT:

None.

CONSENT CALENDAR:

None.

PRESENTATIONS:

None.

STUDY SESSION:

General Manager Straus gave a brief presentation on the coordination of Water Supply Management with surrounding agencies.

BUSINESS:

2019 Budget Workshop

Administrative Services Manager Sohal provided the Board with background concerning the proposed 2019 Budget and Rate Model. She stated that following the Strategic Planning Session on July 17, 2018, staff updated the Financial Model and prepared the proposed 2019 Operating & Maintenance and Capital Improvements. A PowerPoint presentation was used to guide the discussion, highlighting key programs and projects planned for 2019 and sought direction on the budget and rates for 2019.

After further discussion, the Board directed staff to return with a budget reflecting no more than a five percent (5%) rate adjustment for further consideration at the September 19 Board Meeting.

CONSULTANTS' AND LEGAL COUNSEL'S REPORTS:

None.

DIRECTOR'S AND REPRESENTATIVES REPORTS:

None.

MANAGEMENT SERVICES REPORT:

None.

CORRESPONDENCE:

None.

CLOSED SESSION:

None.

FUTURE CHWD BOARD OF DIRECTORS MEETING DATES:

Dates and locations of upcoming Regular Meetings of the Board of Directors were noted for the calendar.

ADJOURNMENT:

There being no other business to come before the Board, the meeting was adjourned at 8:09 p.m.

APPROVED:

_____	_____
CHRISTOPHER CASTRUITA Deputy Secretary Citrus Heights Water District	RAYMOND A. RIEHLE, President Board of Directors Citrus Heights Water District

CITRUS HEIGHTS WATER DISTRICT
AUGUST 2018
2018 REVENUE ANALYSIS

Outstanding Recievables

Aged Trial Balance					
Total	Current	31-90	91-150	>150	Unapplied Current
1,308,134	1,106,570	70,077	3,138	208,841	(80,493)

General Ledger Balance	Total
Outstanding A/R	1,382,498
Outstanding Liens	-
Unclaimed Funds	(8,621)
Outstanding Grants	1,247
Less Unapplied Payments	(81,396)
Total	$ 1,293,728

ASSESSOR/COLLECTOR'S ROLL ADJUSTMENTS FOR
August 31, 2018

Board Of Directors
Citrus Heights Water District

Assessor/Collector Roll Adjustment August-18			
		Dollar	Count
DEFAULT			
One-Time Courtesy	$	52.36	10
InvoiceCloud Error	$	6.47	1
DEFAULT Total	**$**	**58.83**	**11**
DISCONNECT CHG			
FedEx Error	$	312.00	3
DISCONNECT CHG Total	**$**	**312.00**	**3**
3-DAY DOOR HANG			
FedEx Error	$	69.00	3
3-DAY DOOR HANG Total	**$**	**69.00**	**3**
Grand Total	**$**	**439.83**	**17**

Reason For Cancellation	Charge Type	Amount
FedEx Error	3-DAY DOOR HANG	23.00
FedEx Error	3-DAY DOOR HANG	23.00
FedEx Error	DISCONNECT CHG	104.00
FedEx Error	DISCONNECT CHG	104.00
FedEx Error	3-DAY DOOR HANG	23.00
FedEx Error	DISCONNECT CHG	104.00
InvoiceCloud Error	DEFAULT	6.47
One-Time Courtesy	DEFAULT	4.79
One-Time Courtesy	DEFAULT	5.81
One-Time Courtesy	DEFAULT	5.04
One-Time Courtesy	DEFAULT	5.25
One-Time Courtesy	DEFAULT	3.10
One-Time Courtesy	DEFAULT	9.06
One-Time Courtesy	DEFAULT	4.79
One-Time Courtesy	DEFAULT	4.84
One-Time Courtesy	DEFAULT	4.43
One-Time Courtesy	DEFAULT	5.25
		$ 439.83

TREASURER'S REPORT TO THE BOARD OF DIRECTORS
CITRUS HEIGHTS WATER DISTRICT
Month of August 2018

Bank of the West			
Beginning Balance			$5,109,910
RECEIPTS:		1,525,230	
DISBURSEMENTS:			
Checks Issued / ACH Payments	1,232,660		
Payroll	393,935		
Returned Checks	13,012		
		1,639,607	(114,377)
Bank of the West			
Balance per Bank 08/31/2018			4,995,533
Outstanding Checks			(425,585)
Deposit in Transit			68,553
Balance Per Books 08/31/2018			$4,638,501

RECONCILEMENT:	
Bank of the West	$4,638,501
Local Agency Investment Fund	6,192,612
COP Reserve Account	538,476
Money Mkt Activity Account	532,955
TOTAL BALANCE	$11,902,544

CASH & INVESTMENT SUMMARY:	
Bank of the West (General Account)	$4,638,501
Local Agency Investment Fund	6,192,612
COP 2010 Reserve Account	538,476
Money Mkt Activity Account	532,955
Total	$11,902,544

INSTITUTION	MATURITY DATE	INT RATE	DEPOSIT AMOUNT	DATE OF LAST TRANSACTION
Local Agency Investment Fund	**Daily**	**1.90%**	**29,245.64**	**7/12/2018**

I certify that this report accurately reflects all pooled investments and is in compliance with applicable State of California Government Codes and is in conformity with Investment of District Funds Policy 6300. As Treasurer of the Citrus Heights Water District, I hereby certify that sufficient investment liquidity and anticipated revenue are available to meet the next six months' estimated expenditures.

SUSAN K. SOHAL
Treasurer

HILARY M. STRAUS
Secretary

Signed: 09/13/2018

TREASURER'S REPORT OF FUND BALANCES
August 31, 2018

Fund Name	Beginning Balance 01/01/2018	Year to Date Transfers In / Collections	Year to Date Transfers Out	Current Month Transfers In / Collections	Current Month Transfers Out	Ending Balance 08/31/2018	2018 Target Balance per Policy
Operating Fund	$ 2,346,551	$ 7,824,989	$ (8,153,101)	$ 1,525,230	$ (1,639,607)	$ 1,904,062	$ 2,334,017
Operating Reserve	$ 4,258,065	-	-	-	-	$ 4,258,065	N/A
Rate Stabilization Fund	$ 834,000	-	-	-	-	$ 834,000	$ 1,000,000
Capital Improvement Reserve	$ 2,674,821	-	-	-	-	$ 2,674,821	$ 2,681,248
Restricted for Debt Service	$ 536,963	-	-	-	-	$ 536,963	N/A
Water Supply Reserve	$ 200,000	-	-	-	-	$ 200,000	N/A
Water Efficiency Reserve	$ 150,000	-	-	-	-	$ 150,000	$ 200,000
Water Meter Replacement Reserve	$ 1,025,000	-	-	-	-	$ 1,025,000	N/A
Fleet Equipment Reserve	$ 350,069	-	-	-	-	$ 350,069	$ 318,559
Employment-Related Benefits Reserve	$ 223,228	-	-	-	-	$ 223,228	$ 1,079,527
	$ 12,598,697	**$ 7,824,989**	**$ (8,153,101)**	**$ 1,525,230**	**$ (1,639,607)**	**$ 12,156,208**	**$ 7,613,351**

SUSAN K. SOHAL, Treasurer

TREASURER'S REPORT OF FUND BALANCES
August 31, 2018

Fund Transfers Summary:

The Operating Fund Transferred:	$	1,525,230	from funds collected in August 2018 per Treasurer's Report
	$	(1,639,607)	disbursements made in August 2018 per Treasurer's Report
	$	(114,377)	

Citrus Heights Water District
Budget Performance Report
As of 8/31/2018

	August Actual	Year-to-Date Actual	Year-to-Date Budget	YTD Variance Amount	YTD Variance Percent	Annual Budget
Revenues						
Metered Service Charges	$944,167.77	$6,141,370.43	$5,613,192.00	$528,178.43	9.41%	$8,419,792.00
Metered Water Deliveries	830,913.79	2,823,628.67	4,057,947.00	(1,234,318.33)	-30.42%	6,532,500.00
Non-Metered Service Charges	13,945.79	67,695.83	93,336.00	(25,640.17)	-27.47%	140,000.00
Penalties	5,243.34	41,182.24	93,179.00	(51,996.76)	-55.80%	150,000.00
Interest	2,878.49	70,283.97	6,664.00	63,619.97	954.68%	10,000.00
Backflow Fees	5,867.49	34,080.94	77,336.00	(43,255.06)	-55.93%	116,000.00
Water Service Install & S&R	20,598.76	50,395.08	18,200.00	32,195.08	176.90%	27,300.00
Grant Funds		3,525.00		3,525.00	0.00%	
Miscellaneous *	10,239.46	119,707.33	86,664.00	33,043.33	38.13%	130,000.00
Cost Reimbursements	111.06	1,237.74		1,237.74	0.00%	
Income - Wheeling Water		4,410.02	1,677.00	2,733.02	162.97%	2,700.00
Income - Connection Fees	6,776.00	27,104.00		27,104.00	0.00%	
Total Revenue	1,840,741.95	9,384,621.25	10,048,195.00	(663,573.75)	-6.60%	15,528,292.00
*includes Assessments, New Account, Back Charges & other Miscellaneous Revenue Sources						
Operating Expenses						
Cost of Water						
Purchased Water		1,913,266.95	2,056,870.72	(143,603.77)	-6.98%	3,085,306.08
Ground Water	94,735.14	159,111.25	235,433.52	(76,322.27)	-32.42%	341,195.95
	94,735.14	2,072,378.20	2,292,304.24	(219,926.04)	1.44%	3,426,502.03
Labor & Benefits						
Labor Regular	220,928.81	2,038,765.49	1,795,001.72	243,763.77	13.58%	2,693,210.08
Labor Taxes	12,539.01	154,669.03	165,543.36	(10,874.33)	-6.57%	248,315.04
Labor Workers Comp	250.43	22,032.14	42,000.00	(19,967.86)	-47.54%	63,000.00
Labor External	12,039.75	16,135.57	60,466.72	(44,331.15)	-73.31%	90,700.08
Benefits Med/Den/Vis	42,888.05	333,237.13	317,029.92	16,207.21	5.11%	475,544.88
Benefits LTD/Life/EAP	6,567.77	30,990.31	23,579.36	7,410.95	31.43%	35,369.04
Benefits CalPers	38,201.61	168,135.88	519,160.48	(351,024.60)	-67.61%	778,740.72
Benefits Other	2,913.29	17,884.45	20,000.00	(2,115.55)	-10.58%	30,000.00
Benefit Retiree Expenses	3,539.30	28,369.40	33,688.64	(5,319.24)	-15.79%	50,532.96
Benefit Unemployment	74.81	5,103.27	5,600.00	(496.73)	-8.87%	8,400.00
Benefit GASB 68	49,965.00	432,323.48		432,323.48	0.00%	
Capitalized Labor & Benefit Contra	(42,842.75)	(318,959.56)		(318,959.56)	0.00%	
	347,065.08	2,928,686.59	2,982,070.20	(53,383.61)	-1.79%	4,473,812.80
General & Administrative						
Fees & Charges	10,869.05	74,110.57	66,282.95	7,827.62	11.81%	102,409.59
Regulatory Compliance/Permits	3,303.60	23,035.80	83,343.36	(60,307.56)	-72.36%	125,015.04
District Events & Recognition	5,051.99	20,699.29	17,886.72	2,812.57	15.72%	26,830.08
Maintenance/Licensing	2,066.66	37,109.00	100,548.88	(63,439.88)	-63.09%	150,823.32
Equipment Maintenance	7,757.04	49,213.45	46,666.64	2,546.81	5.46%	69,999.96

Professional Development	5,691.56	40,274.16	60,203.50	(19,929.34)	-33.10%	94,533.50
Department Admin	44,937.69	73,397.34	36,416.56	36,980.78	101.55%	54,624.84
Dues & Subscriptions	261.99	64,054.29	95,419.36	(31,365.07)	-32.87%	143,129.04
Fuel & Oil	5,741.85	35,665.79	34,000.00	1,665.79	4.90%	51,000.00
General Supplies	1,418.15	22,897.92	24,733.36	(1,835.44)	-7.42%	37,100.04
Insurance - Auto/Prop/Liab		21,532.16	56,666.64	(35,134.48)	-62.00%	84,999.96
Leasing/Equipment Rental	1,658.14	13,023.57	20,254.64	(7,231.07)	-35.70%	30,381.96
Parts & Materials	30,603.79	221,067.57	36,666.72	184,400.85	502.91%	55,000.08
Postage/Shipping/Freight	11,479.84	83,912.73	82,314.05	1,598.68	1.94%	123,294.74
Rebates & Incentives	1,200.00	8,000.00	13,120.00	(5,120.00)	-39.02%	19,680.00
Telecom/Network	4,799.04	23,568.26	27,533.36	(3,965.10)	-14.40%	41,300.04
Tools & Equipment	1,447.43	33,738.32	41,133.36	(7,395.04)	-17.98%	61,700.04
Utilities	510.46	3,590.67	21,533.36	(17,942.69)	-83.33%	32,300.04
Write-Off Bad Debt Exp			3,333.36	(3,333.36)	-100.00%	5,000.04
Capitalized G&A Contra	(21,433.17)	(201,846.54)		(201,846.54)	0.00%	
Capitalized Equipment Contra	(38,756.64)	(225,671.03)		(225,671.03)	0.00%	
	78,608.47	421,373.32	868,056.82	(446,683.50)	-51.46%	1,309,122.31
Professional & Contract Services						
Support Services	83,007.69	555,946.84	1,151,783.36	(595,836.52)	-51.73%	1,727,675.04
Legal Services	16,932.21	101,726.25	217,333.36	(115,607.11)	-53.19%	326,000.04
Printing Services	2,733.26	5,792.01	26,800.00	(21,007.99)	-78.39%	38,515.00
	102,673.16	663,465.10	1,395,916.72	(732,451.62)	-52.47%	2,092,190.08
Reserves & Debt Services						
Interest Expense		66,278.37	490,624.00	(424,345.63)	-86.49%	735,936.00
Depreciation		3.72		3.72	0.00%	
Net Increase(Descrease) in Value of Investments		(11,671.29)		(11,671.29)	0.00%	
		54,610.80	490,624.00	(436,013.20)	-88.87%	735,936.00
Total Operating Expenses	623,081.85	6,140,514.01	8,028,971.98	(1,888,457.97)	-23.52%	12,037,563.22
Net Income / (Expense)	1,217,660.10	3,244,107.24	2,019,223.02	1,224,884.22	60.66%	3,490,728.78

Citrus Heights Water District
Capital Projects Summary
Fiscal Period End as of 8/2018

Project Number	Project Name	BUDGET			COMMITMENTS	AMOUNTS PAID			PROJECTION
		Expenditures to 12/2017	Remaining Budget	2018 Budget	Open Commitments	Month to Date	Year to Date	Project to Date	2019 Forecast
C15-102	Corporation Yard Improvements	$1,593,598	$1,038,727	$0	$0	$0	$701,790	$2,295,388	
C15-133	Higland Ave and Rosa Vista	$35,334	$361,153	$0	$0	$1,934	$404,844	$440,177	
C16-131	Wind Way and Longwood Way	$7,785	$319,373	$305,154	$0	$295	$13,101	$20,886	
C16-134	Auburn Blvd-Rusch Park Placer	$0	$166,357	$157,880	$0	$0	$609	$609	
C16-142	Sunrise Bl Streetscape Ph 2	$450	$49,550	$0	$0	$9,807	$40,344	$40,794	
C18-101	Stock Ranch Res. Svc Replcmnts	$0	$662,653	$607,432	$0	$0	$0	$0	
Construction in Progress		**$1,637,167**	**$2,597,813**	**$1,070,466**	**$0**	**$12,036**	**$1,160,688**	**$2,797,855**	
C18-010	Water Main Replacements	$0	$64,888	$59,897	$0	$0	$5,352	$5,352	
C18-011	Water Valve Replacements	$0	$144,200	$135,428	$0	$2,566	$12,845	$12,845	
C18-012	Water Service Connections	$0	$850,000	$823,750	$0	$75,572	$594,413	$594,413	
C18-013	Water Meter Replacements	$0	$107,000	$98,083	$0	$5,435	$40,174	$40,174	
C18-014	Fire Hydrants	$0	$154,500	$150,787	$0	$7,119	$53,167	$53,167	
Annual Infrastructure		**$0**	**$1,320,588**	**$1,267,945**	**$0**	**$90,692**	**$705,950**	**$705,950**	
C15-104B	Document Management System	$5,361	$244,639	$120,000	$0	$0	$0	$5,361	
C17-004A	Server Upgrade	$18,190	$81,810	$0	$0	$45,923	$45,923	$64,113	
C17-004B	Workstation Replacements	$1,405	$18,595	$0	$0	$0	$0	$1,405	
C18-003	Fleet/Field Operations Equip	$0	$287,500	$287,500	$0	$0	$106,036	$106,036	
C18-004	Technology Hardware/Software	$0	$35,000	$32,308	$0	$0	$11,374	$11,374	
Fleet and Equipment		**$24,956**	**$667,544**	**$439,808**	**$0**	**$45,923**	**$163,333**	**$188,288**	
C15-101	Fairway 12" & 8" Intertie	$1,217	$18,473	$0	$0	$0	$18,010	$19,227	
C15-109	Blossom Hill Way 6" & 10" Inte	$0	$22,015		$0	$0	$0	$0	
C15-110	Crestmont Ave 6" Intertie	$0	$19,980		$0	$0	$0	$0	
C15-132	Graham Cir and CIrcuit Dr	$30,268	$540,716	$524,048	$0	$15,994	$511,768	$542,036	
C17-100	24in Oak at C-Bar-C to Arcade	$0	$2,100,000	$500,000	$0	$0	$0	$0	$750,000

Citrus Heights Water District
Capital Projects Summary
Fiscal Period End as of 8/2018

Project Number	Project Name	BUDGET			COMMITMENTS	AMOUNTS PAID			PROJECTION
		Expenditures to 12/2017	Remaining Budget	2018 Budget	Open Commitments	Month to Date	Year to Date	Project to Date	2019 Forecast
C17-101	Pleasant View Dr-Oak to Poppy	$6,549	$492,682	$460,130	$0	$0	$4,455	$11,004	
C17-102	Michigan Dr - Sunrise to West	$1,289	$247,969	$231,005	$0	$0	$7,880	$9,168	
C18-102	Thunderhead Cir 8in Main Rplc	$0	$665,842	$292,049	$0	$0	$30	$30	$349,456
C18-103	Cologne Way 6in Main Replace	$0	$242,384	$116,345	$0	$0	$0	$0	$116,343
C18-104	Quiet Oak Ln 8in Main Oak S	$0	$121,011	$58,085	$0	$0	$0	$0	$58,085
C18-105	Old Auburn Rd Dafodil Wooddale	$0	$0		$0	$0	$0	$0	
Water Mains		**$39,323**	**$4,471,072**	**$2,181,662**	**$0**	**$15,994**	**$542,143**	**$581,465**	**$1,273,884**
C17-005	Facilities Improvements	$0	$34,103	$0	$0	$0	$34,103	$34,103	
C17-103	Operations Building Remodel	$19,010	$1,455,990	$1,300,000	$0	$0	$0	$19,010	
C18-005	Facilities Improvements	$0	$125,000	$87,950	$0	$0	$37,050	$37,050	
C18-040	Other City Partnerships	$0	$300,000	$275,000	$0	$0	$0	$0	
C18-041	Other Infrastructure Projects	$0	$103,000	$94,417	$0	$0	$0	$0	
Miscellaneous Projects		**$19,010**	**$2,018,093**	**$1,757,367**	**$0**	**$0**	**$71,153**	**$90,163**	
C17-020	Groundwater Well Improvements	$2,884	$162,616	$0	$0	$113,965	$192,347	$195,231	
C17-020A	Groundwater Well Rehab Sunrise	$0	$50,500	$23,146	$0	$0	$0	$0	
C17-104	Groundwater Well Property Acq	$123,943	$516,057	$0	$0	$1,140	$64,260	$188,202	
C17-104A	Groundwater Well Prop Highland	$0	$250,000	$0	$0	$7,636	$13,327	$8,065	$0
C18-020	Groundwater Well Improvements	$0	$100,000	$91,667	$0	$0	$10,376	$10,376	
C18-106	Groundwater Well #7	$0	$796,860	$382,493	$0	$0	$0	$0	$382,493
Wells		**$126,827**	**$1,876,033**	**$497,305**	**$0**	**$122,740**	**$280,309**	**$407,136**	**$382,493**
	Grand Totals:	**$1,847,282**	**$12,951,144**	**$7,214,553**	**$0**	**$287,384**	**$2,923,576**	**$4,770,859**	**$1,656,377**

AUGUST 2018 WARRANTS

CHECK	PAYEE	DESCRIPTION	AMOUNT
65985	ACWA/JPIA	Workers Comp Insurance	$21,781.71
65986	B&M Builders	Contract Services-Engineering	$20,239.38
65987	Robin Cope	Health Insurance	$422.30
65988	Cybex	Equipment Rental-Office	$158.16
65989	Ferguson Enterprises Inc #1423	Material	$9,630.00
65990	Hanlees Chrysler Dodge	Fixed Assets	$35,890.85
65991	MP Nexlevel of California, Inc	Contract Services-Miscellaneous	$8,720.78
65992	San Juan Water District	Purchased Water	$694,483.41
65993	SMUD	Utilities	$16,323.43
65994	Sonitrol	Equipment Rental-Office	$175.10
65995	AFLAC	Employee Paid Insurance	$395.99
65996	The Lincoln National Life Insurance Company	Disability & Life Insurance	$9,537.39
65997	United States Treasury	Health Insurance	$72.56
65998	Richard E Farley	Customer Refund	$140.79
65999	Raymond H Witt	Customer Refund	$93.89
66000	Robert K/Jane Daly	Customer Refund	$52.29
66001	Ronald O/Lou A Foltyn	Customer Refund	$121.24
66002	Young M/Il Hui Lee	Customer Refund	$111.47
66003	Vyacheslav Palko	Customer Refund	$36.41
66004	James K/Lou E Hocutt	Customer Refund	$146.81
66005	Lamar Elston	Customer Refund	$90.75
66006	HomePointe Property Mgmt	Customer Refund	$17.92
66007	Igor Gulegin	Customer Refund	$96.31
66008	Judy B Edgar	Customer Refund	$32.06
66009	Danny D/Melissa A Salazar	Customer Refund	$26.99
66010	GH Perkins Family Trust	Customer Refund	$94.26
66011	Keller Williams Realty	Customer Refund	$171.02
66012	Michael B Walker	Customer Refund	$68.34
66013	Brad J Squires	Customer Refund	$239.40
66014	Qualls 2006 Trust	Customer Refund	$233.97
66015	John L/Jacke Ridge	Customer Refund	$23.43
66016	Larry W/Myra Kay Sinor	Customer Refund	$156.21
66017	AP&H Inc., a CA NonProfit Corporation	Customer Refund	$88.74
66018	Namale Investors LLC	Customer Refund	$165.33
66019	Andrew Kortes	Customer Refund	$18.56
66020	Deborah L Mello	Customer Refund	$7.78
66021	Lawrence J Grace	Customer Refund	$31.94
66022	Stix Development	Customer Refund	$330.94
66023	Roman Vilde	Customer Refund	$226.77
66024	Felicia M Martinez	Customer Refund	$242.17

66025	Jessica L/Christopher J Beardslee	Customer Refund	$15.19
66026	Marla J Kuresa	Customer Refund	$25.00
66027	ABA DABA Rentals & Sales	Supplies-Field	$126.88
66028	AIA Services, LLC/NDS	Conservation-Material/Supplies	$184.48
66029	AM Conservation Group Inc	Conservation-Material/Supplies	$183.18
66030	AnswerNet	Telephone-Answering Service	$277.35
66031	AREA Restroom Solutions	Equipment Rental-Field	$118.76
66032	Astral Communications Inc	Telephone-Wireless	$274.00
66033	Brake Masters #220	Repair-Trucks	$161.49
66034	Bryce Consulting, Inc	Legal & Audit	$6,100.00
66035	BSK Associates	Water Analysis	$1,812.00
66036	Caltronics Business System	Small Office Equipment	$199.34
66037	Void	Void	$0.00
66038	City of Citrus Heights	Permit Fees	$2,762.10
66039	Consolidated	Telephone-Local/Long Distance	$1,938.76
66040	Core & Main LP	Material	$1,305.28
66041	Corelogic Information Solutions Inc	Dues & Subscriptions	$200.00
66042	Corix Water Products, Inc	Material	$1,178.79
66043	Dawson Oil Company	Gas & Oil	$629.54
66044	Dr. Well Water Well Services Inc	Wells Maintenance	$750.00
66045	Fast Action Pest Control	Contract Services-Miscellaneous	$115.00
66046	Debby Figoni	Water Conservation-Other	$1,036.00
66047	Gaynor Telesystems Incorporated	Contract Services-Other	$175.00
66048	Grainger	Small Tools	$85.21
66049	Ferguson Enterprises Inc #1423	Material	$7,851.65
66050	Integrity Administrators Inc	Health Insurance	$343.98
66051	KBA DOCUSYS	Equipment Rental-Office	$23.20
66052	KBA Docusys Inc	Equipment Rental-Office	$342.63
66053	Lowe's	Supplies-Field	$46.91
66054	Miles Treaster & Associates	Office Expense	$178.49
66055	Moonlight BPO	Contract Services-Bill Print/Mail	$7,730.25
66056	One Print Source & Graphics	Printing	$227.93
66057	Pace Supply Corp	Material	$1,527.96
66058	Protection One Alarm Monitoring	Equipment Rental-Office	$196.95
66059	Republic Services #922	Utilities	$280.85
66060	Regional Government Services	Contract Services-Other	$2,732.50
66061	River City Fire Equipment	Repair-Equipment/Hardware	$38.50
66062	RW Trucking	Contract Services-Miscellaneous	$2,252.50
66063	Les Schwab Tires	Repair-Trucks	$5,375.86
66064	Staples Advantage	Office Expense	$439.58
66065	Superior Equipment Repair	Repair-Trucks	$774.51
66066	SureWest Directories	Telephone-Local/Long Distance	$49.00
66067	State Water Resources Control Board	Dues & Subscriptions	$60.00
66068	A. Teichert & Son, Inc.	Road Base	$1,008.95

66069	Verizon Wireless	Telephone-Wireless	$1,288.40
66070	Voyager Fleet Systems Inc	Gas & Oil	$2,589.63
66071	WaterWise Consulting, Inc	Contract Services-Conservation	$200.00
66072	City of Citrus Heights	Permit Fees	$850.00
66073	City of Citrus Heights	Permit Fees	$1,125.00
66074	Moonlight BPO	Contract Services-Bill Print/Mail	$2,579.55
66075	Citrus Heights Police Department	Equipment Rental-Office	$35.00
66076	Berg Trust	Customer Refund	$42.64
66077	Steven R/Susan M Winkel	Customer Refund	$407.69
66078	Benjamin/Lauren Scott	Customer Refund	$113.12
66079	Carrington Mortgage Services LLC	Customer Refund	$18.62
66080	Adobe Systems Incorporated	Maintenance Agreement-Software	$1,845.36
66081	Alexander's Contract Services	Contract Services-Meter Read	$1,770.94
66082	Avalon Custodial Care	Janitorial	$695.00
66083	Axcient Holdings LLC	Maintenance Agreement-Software	$444.30
66084	Best Best & Krieger	Legal & Audit	$4,867.50
66085	Bryce Consulting, Inc	Legal & Audit	$6,100.00
66086	BSK Associates	Water Analysis	$322.00
66087	Corix Water Products, Inc	Material	$387.90
66088	Sacramento County Utilities	Utilities	$189.60
66089	Dawson Oil Company	Gas & Oil	$1,326.76
66090	Express Office Products Inc	Office Expense	$67.44
66091	Golden State Flow Measurement, Inc	Material	$1,600.09
66092	Ferguson Enterprises Inc #1423	Material	$1,414.92
66093	J4 Systems	Contract Services-Other	$1,160.00
66094	Kaiser Foundation Health Plan, Inc	Health Insurance	$23,567.37
66095	Liebert Cassidy Whitmore	Legal & Audit	$74.00
66096	Pacific Gas & Electric	Utilities	$8.76
66097	Regional Government Services	Contract Services-Other	$3,640.48
66098	Les Schwab Tires	Repair-Trucks	$786.99
66099	Sacramento Groundwater Authority	Dues & Subscriptions	$750.00
66100	Sierra Office and Printing	Conservation-Material/Supplies	$2,459.00
66101	Sutter Medical Foundation-Corporate	Contract Services-Other	$250.43
66102	Verizon Wireless	Telephone-Wireless	$1,399.53
66103	World Environment & Energy Inc	Contract Services-Miscellaneous	$404.68
66104	William C Smith Living Trust	Customer Refund	$121.84
66105	Evosevich Trust	Customer Refund	$225.60
66106	Carl Stillwell	Customer Refund	$202.64
66107	Falconi Family Trust	Customer Refund	$23.41
66108	Gary Hannon	Customer Refund	$73.31
66109	Parr 2006 Living Trust	Customer Refund	$184.05
66110	Janet R Gulebian	Customer Refund	$57.32
66111	Robert J/Sandra L Wyatt	Customer Refund	$35.25
66112	Ardell D/Margaret Hurst	Customer Refund	$100.02

66113	Marcus P/Amy M Adcock	Customer Refund	$25.17
66114	George Austin Revocable Trust	Customer Refund	$76.49
66115	Born Trust	Customer Refund	$14.05
66116	Housing Group Fund, LLC	Customer Refund	$57.38
66117	Cheyenne Gonzales	Customer Refund	$57.23
66118	Frederick M/Carolyn Cardinal	Customer Refund	$100.00
66119	Timothy/Debra/Adam B Holcomb	Customer Refund	$210.22
66120	Lynn Rose/Vincent Lanuza	Customer Refund	$57.51
66121	Lawrence J Moulton	Customer Refund	$124.57
66122	Elvira L Pye	Customer Refund	$83.61
66123	Alexander's Contract Services	Contract Services-Meter Read	$5,116.46
66124	CA-NV AWWA	Dues & Subscriptions	$80.00
66125	Bart/Riebes Auto Parts	Repair-Trucks	$124.40
66126	Best Best & Krieger	Legal & Audit	$7,920.00
66127	Brake Masters #220	Repair-Trucks	$115.20
66128	City of Citrus Heights	Permit Fees	$334.20
66129	Earl E or Sallie J Corley	Toilet Rebate Program	$75.00
66130	Robert Dullanty	Toilet Rebate Program	$75.00
66131	Express Office Products Inc	Office Expense	$128.03
66132	Horacio Freitas	Material	$1,300.00
66133	J4 Systems	Contract Services-Other	$7,132.00
66134	Nancy Malinowski-Griffith	Toilet Rebate Program	$75.00
66135	Anita Martin	Toilet Rebate Program	$75.00
66136	One Print Source & Graphics	Printing	$46.33
66137	Valeriy Pulber	Toilet Rebate Program	$150.00
66138	Red Wing Shoe Store	Small Tools	$444.70
66139	The Lincoln National Life Insurance Company	Disability & Life Insurance	$7,577.42
66140	Titan Workforce LLC	Contract Services-Temporary Labor	$4,675.86
66141	Frank Wang	Toilet Rebate Program	$150.00
66142	Warren Consulting Engineers Inc	Contract Services-Engineering	$4,350.00
TOTAL			$978,589.37

ACH	8/23/18 PAYDAY	Deferred Compensation	$25.00
ACH	8/6/18 PAYDAY VALIC	Deferred Compensation	$2,904.50
ACH	8/6/18 PAYDAY VOYA	Deferred Compensation	$25.00
ACH	GASB 68 8/20/18	PERS	$49,965.00
ACH	GASB 68 FEES	PERS	$1,050.00
ACH	JULY 2018	Bank Fee	$1,992.44
ACH	JULY 2018 BOW	Bank Fee	$1,567.35
ACH	JULY 2018 FD	Bank Fee	$119.98
ACH	JULY 2018 PH	Bank Fee	$117.98
ACH	JULY 2018 WB	Bank Fee	$87.98
ACH	PAYCHEX 8/10/18	Contract Services-Other	$430.50

ACH	PERS 7/12/18 PAYDAY	PERS	$18,823.54
ACH	PERS 7/25/18 PAYDAY	PERS	$18,586.86
ACH	PERS 8/23/18 PAYDAY	PERS	$19,303.77
ACH	PERS 8/8/18 PAYDAY	PERS	$18,965.45
ACH	SEPT 2018	Health Insurance	$13,885.21
ACH	VALIC 8/23/18 PAYDAY	Deferred Compensation	$2,904.50
ACH	VANCO JULY 2018	Contract Service-Other	$0.84
ACH	1168-2018-7 INVOICE CLOUD	Bank Fee	$4,176.75
TOTAL			$154,932.65
GRAND TOTAL			$1,133,522.02

September Payments Approved at September Board Meeting

ACH 2035-004 LUND	LUND CONSTRUCTION	Contract Services-Engineering	$9,880.38
ACH 38415 HARRIS	HARRIS & ASSOCIATES	Contract Services-Engineering	$15,904.93
ACH 38696 HARRIS	HARRIS & ASSOCIATES	Contract Services-Engineering	$37,436.80
ACH AUGUST 2018	US BANK I.M.P.A.C. GOVERNMENT SERVICES	See September Agenda Item CC-8	$11,123.19
ACH CORIX	CORIX WATER PRODUCTS	Material	$8,869.78
66197	CIRCLEPOINT	Contract Services- Conservation	$13,645.59
66198	J4 SYSTEMS	Contract Services-Other	$38,790.57
66199	KIRBY'S PUMP AND MECHANICAL	Wells Maintenance	$113,964.75
66200	SMUD	Utilities	$43,827.22
			$293,443.21

US BANK - CAL-Card Distributions
August 2018

Name	Dues & Subscriptions	Office Misc. - District Event	Supplies	Postage	Office - Expense	Office - Miscellaneous	Meeting Accommodations	Repair - Truck	Continued Education	Maint. Agrmt. - Software	Small Office Equipment	Permit Fees	Tools	Office Misc. - Other	Telephone	Total Bill
Cutler			$ 59.15													$ 59.15
Dietrich						$ 158.39										$ 158.39
Gordon							$ 19.97	$ 103.98								$ 123.95
Henry							$ 997.61		$ 1,050.00							$ 2,047.61
Ott									$ 1,855.80	$ 450.00	$ 167.30					$ 2,473.10
Sohal					$ 32.31		$ 70.97			$ 249.68		$ 20.00				$ 372.96
Spiers			$ 2,090.44			$ 7.06	$ 19.92	$ 87.50								$ 2,204.92
Straus	$ 12.99						$ 44.61									$ 57.60
Shockley		$ 85.26	$ 210.54	$ 56.30	$ 269.15	$ 118.14	$ 47.26		$ 2,645.76		$ (13.27)		$ 30.15	$ 3.87	$ 172.35	$ 3,625.51
Total Bill	**$ 12.99**	**$ 85.26**	**$ 2,360.13**	**$ 56.30**	**$ 301.46**	**$ 283.59**	**$ 1,200.34**	**$ 191.48**	**$ 5,551.56**	**$ 699.68**	**$ 154.03**	**$ 20.00**	**$ 30.15**	**$ 3.87**	**$ 172.35**	**$ 11,123.19**

Citrus Heights Water District

2018 Director Training Courses/Seminars/Conferences

as of 9/13/2018

Date	Days	Topic	Organizing Agency	Location	Attendee	Total Expenses	Registration	Hotel	Air/Travel	Car rental	Meals	Parking/Taxi/ phone
05/8/18-05/11/18	4	ACWA 2018 Spring Conference	ACWA	Sacramento, CA	Ray Riehle	699.00	699.00					
05/8/18-05/11/18	4	ACWA 2018 Spring Conference	ACWA	Sacramento, CA	Al Dains	699.00	699.00					
05/8/18-05/11/18	4	ACWA 2018 Spring Conference	ACWA	Sacramento, CA	Caryl Sheehan	699.00	699.00					
11/27-11/29/18	3	ACWA 2018 Fall Conference	ACWA	San Diego, CA	Ray Riehle	858.96	699.00		159.96			
					Grand Total	2,955.96						

Citrus Heights Water District

2018 Staff Training Courses/Seminars/Conferences

as of 9/13/2018

Date	Days	Topic	Organizing Agency	Location	Attendee	Total Expenses	Registration	Hotel	Air/Travel	Car rental	Meals	Parking/Taxi/ phone
1/8-1/12/18	4	Cappo Conference	Cappo	Palm Springs	Beth Shockley	835.45		428.18		261.45	105.82	40.00
5/8-5/11/18	4	CityWorks Conference	City Works	Salt Lake City	Tim Cutler	721.76		468.09	198.96		54.71	
2/20-2/23/18	3	CSMFO	CSMFO	Riverside, CA	Alberto Preciado	1,528.16	370.00	441.87	282.96		55.47	377.86
2/25-2/28/18	3	LCW Annual Conference	LCW	San Francisco	Hilary Straus	1,175.68	525.00	650.68				
2/25-2/28/18	3	LCW Annual Conference	LCW	San Francisco	Susan Sohal	525.00	525.00					
1/29-2/1/18	4	Esri Conference 2018	ESRI	San Diego, CA	Borey Swing	1,320.30		942.16		49.45	278.69	50.00
1/29-2/1/18	4	Esri Conference 2018	ESRI	San Diego, CA	Tamar Dawson	1,224.60		942.16		23.25	259.19	
5/8-5/11/18	4	ACWA Spring Conference	ACWA	Sacramento, CA	David Gordon	699.00	699.00					
5/8-5/11/18	4	ACWA Spring Conference	ACWA	Sacramento, CA	Hilary Straus	699.00	699.00					
5/8-5/11/19	5	ACWA Spring Conference	ACWA	Sacramento, CA	Missy Pieri	699.00	699.00					
7/8/7/12/18	4	Esri User Conference	Esri	San Diego, CA	Borey Swing	1,696.98		1169.09	218.96		197.55	111.38
6/11-6/14/18	3	AWWA Annual Conference	AWWA	Las Vegas, NV	Kelly Drake	1,759.82	980.00	201.82	326.96	28.90	222.14	
6/10-6/14/18	4	AWWA Annual Conference	AWWA	Las Vegas, NV	Tamar Dawson	2,548.78	1090.00	898.00	314.96	15.45	230.37	
6/10-6/14/18	4	AWWA Annual Conference	AWWA	Las Vegas, NV	Rex Meurer	2,111.96	910.00	898.00	303.96			
6/10-6/14/18	4	AWWA Annual Conference	AWWA	Las Vegas, NV	Missy Pieri	2,610.59	1090.00	898.00	314.96		192.63	115.00
10/17-10/19/18	3	Cal/Osha Summit 2018	Cal/Osha	San Diego, CA	Kelly Drake	1,920.46	980.00	673.50	266.96			
4/12-4/13/18	2	Capio Conference	Capio	Santa Rosa, CA	Madeline Henry	380.86	325.00	27.93		27.93		
4/12-4/13/18	2	Capio Conference	Capio	Santa Rosa, CA	Chris Castruita	380.86	325.00	27.93		27.93		
10/2-10/5/18	4	Watersmart Innovations	Watersmart Inn	Las Vegas, NV	Rex Meurer	740.96	445.00		295.96			
10/21-10/24/18	4	CalPers Educational Forum	CalPers	Indian Wells, Ca	Chris Castruita	349.00	349.00					
10/21-10/24/18	4	CalPers Educational Forum	CalPers	Indian Wells, Ca	Alberto Preciado	349.00	349.00					
11/27-11/29/18	3	ACWA Fall Conference	ACWA	San Diego, CA	Hilary Straus	850.96	699.00		151.96			
11/27-11/29/19	3	ACWA Fall Conference	ACWA	San Diego, CA	Susan Sohal	850.96	699.00		151.96			
10/22-10/24/18	3	CSDA Board Secretary Conference	CSDA	Lake Tahoe, CA	Madeline Henry	1,323.92	800.00	523.92				
11/6-11/7/18	2	Neptune Gage Meter School	Neptune	Tallassee, Ala	Kelly Drake	295.00	295.00					
11/6-11/7/18	2	Neptune Gage Meter School	Neptune	Tallassee, Ala	Brady Chambers	295.00	295.00					
10/30-11/2/18	3	Harris Customer Training conference	Harris Computer	Chicago, IL	Jeff Ott	927.90	927.90					
10/30-11/2/18	3	Harris Customer Training conference	Harris Computer	Chicago, IL	Dana Mellado	1,217.86	927.90		289.96			
11/27-11/29/19	3	ACWA 2018 Fall Conference	ACWA	San Diego, CA	David Wheaton	826.96	699.00		127.96			
					Grand Total	**30,865.78**						

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT : EMPLOYEE RECOGNITION
STATUS : Information Item
REPORT DATE : September 12, 2018
PREPARED BY : Christopher Castruita, Management Services Supervisor/Chief Board Clerk

The following District employees were recognized for perfect attendance during July 2018, and outstanding customer service and quality of work during the month of August 2018.

Administrative Services & Water Efficiency Department

Name	Attendance	Customer Service	Work Quality
Chris Castruita	Yes		Reworked the budget process Power Point slides for presentation at the Sept 5 Meeting
Brady Chambers	Yes		8-10-18 - Worked on a Friday to conduct a water efficiency review with Almaden Place Townhomes.
Kelly Drake	Yes		8-9-10 - Presented a Safety Presentation at the monthly Safety Meeting.
Madeline Henry	Yes		8-1-18 – Madeline caught an error on a factsheet and fixed prior to distribution to the public. 8-8-18 - Madeline caught an error on a FaceBook post and corrected prior to distribution to the public.
Mersadez Hogan			

Name	Attendance	Customer Service	Work Quality
Dana Mellado	Yes	Worked with customer agitated with delinquent account. Dana was extremely patient with the customer, explained to him the account situation, and came up with a plan to bring his account current.	
Rex Meurer	Yes		
Jeff Ott	Yes		
Alberto Preciado	Yes		Presentation at the August Board Meeting
Desiree Smith	Yes		Assisted in reconciling errors in the imported payments that would have caused a customer late charges.
Beth Shockley			Assisted in researching information used for water audit calculations.

Engineering Department

Name	Attendance	Customer Service	Work Quality
Tamar Dawson	Yes		8/3/18 - Worked off-hours to complete plan review of several private development projects.
Paul Dietrich	Yes	Has spent numerous extra hours working on the Asset Inventory.	
Borey Swing	Yes		
Neil Tamagni	Yes		

Operations Department

Name	Attendance	Customer Service	Work Quality
James Buford			
Tim Cutler	Yes		
James Ferro	Yes	Customer on Bellbrook Ct. expressed their gratitude for the work performed by the crew while replacing a water service in a small court in front of their house. Customer stated that the crew was very professional and left the job site very clean.	8-30-18 – Assisted in the emergency water service replacement on Glenn Avenue.
Jarrett Flink		Customer on Patti Jo Drive called to complement the crew for a great job in replacing her landscape after finishing 3 water service a 1 blow off replacement in the same excavation.	8-30-18 – Assisted in the emergency water service replacement on Glenn Avenue.
Gil Garcia		Customer on Patti Jo Drive called to complement the crew for a great job in replacing her landscape after finishing 3 water service a 1 blow off replacement in the same excavation.	Assisted with Meter Testing Program.
Brian Hensley	Yes		
Daniel Hesse		Customer on Bellbrook Ct. expressed their gratitude for the work performed by the crew while replacing a water service in a small court in front of their house. Customer stated that the crew was very professional and left the job site very clean.	8-30-18 – Assisted in the emergency water service replacement on Glenn Avenue.

Rick Jimenez	Yes	1) Customer on Chipmunk Way came into the office to compliment the group for excellent customer service. 2) Customer on Hera Way called to complement the crew for explaining the entire process for replacing a water service.	
Ricky Kelley		Customer on Bellbrook Ct. expressed their gratitude for the work performed by the crew while replacing a water service in a small court in front of their house. Customer stated that the crew was very professional and left the job site very clean.	8-30-18 – Assisted in the emergency water service replacement on Glenn Avenue.
Mike Mariedth	Yes	1) Customer on Chipmunk Way came into the office to compliment the group for excellent customer service. 2) Customer on Hera Way called to complement the crew for explaining the entire process for replacing a water service.	
Chris Nichols	Yes		Assisted with CHWD's groundwater transfer by coming in after hours to perform the well monitoring requirements (e.g., measurements).
Ryon Ridner		Customer on Patti Jo Drive called to complement the crew for a great job in replacing her landscape after finishing 3 water service a 1 blow off replacement in the same excavation.	
Nick Spiers	Yes		

John Spinella	Yes		
Jason Tupper			Assisted with CHWD's groundwater transfer by coming in after hours to perform the well monitoring requirements (e.g., measurements).

AGENDA ITEM: CC-12

CITRUS HEIGHTS WATER DISTRICT
DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT : LONG RANGE AGENDA
STATUS : Consent/Information Item
REPORT DATE : September 5, 2018
PREPARED BY : Madeline Henry, Management Services Specialist/Deputy Board Clerk
Christopher Castruita, Management Services Supervisor/Chief Board Clerk

OBJECTIVE:
Listed below is the current Long Range Agenda.

Legend	
S	Study Session
CC	Consent Calendar
P	Presentation
B	Business
PH	Public Hearing
CL	Closed Session

CITRUS HEIGHTS WATER DISTRICT LONG RANGE AGENDA

MEETING DATE	MEETING TYPE	ITEM DESCRIPTION	ASSIGNED	AGENDA TYPE	AGENDA ITEM
October 17, 2018					
October 17, 2018		Accept Easement for 7115 Greenback Lane	**Pieri**	**CC**	A
October 17, 2018		Accept Easements for Rosa Vista Lane	**Pieri**	**CC**	A
October 17, 2018		Approve an On-Call Pavement Restoration Agreement	**Gordon/Cutler**	**CC**	A
October 17, 2018		Water Meter Replacement Reserve Policy	**Sohal/Preciado**	**CC**	A
October 17, 2018		2018 Strategic Plan Update	**Castruita/Henry**	**B**	A
November 14, 2018					
November 14, 2018		2019 Misc. Charges and Fees - Proposed	**Sohal**	**S**	I/D
November 14, 2018		Cost-of-Living Adjustment to Salary Schedule, Retiree Insurance Benefits, and Directors' Compensation	**Castruita/Henry**	**B**	A
November 14, 2018		Results of District Elections	**Castruita**	**B**	A
November 14, 2018		Irrigation Efficiency Reviews Outreach Program	**Meurer**	**S**	I/D
November 14, 2018		Anticipated Litigation	**Pieri/Nelson**	**CL**	A
November 14, 2018		Transfer/Exchange of Real Property	**Pieri/Nelson**	**CL**	A
December 5, 2018					
December 5, 2018	**Special Board Meeting**	2019 Operating and Capital Budgets	**Straus/Sohal/Pieri/Gordon**	**PH**	A
December 5, 2018	**Special Board Meeting**	2019 Water Rates, Charges & Fees	**Straus/Sohal**	**PH**	A
December 5, 2018	**Special Board Meeting**	2019 Capacity Fees	**Straus/Sohal**	**PH**	A
December 19, 2018					
December 19, 2018		Recognition of Al Dains for Service to CHWD	**Castruita**	**P**	I/D
December 19, 2018		Approval of Land Exchange Agreement	**Pieri/Nelson**	**B**	A
December 19, 2018		Seating of Newly Elected Board Member	**Castruita**	**B**	A
December 19, 2018		Selection of President and Vice President	**Castruita**	**B**	A
December 19, 2018		Selection of District Officers	**Castruita**	**B**	A

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT : ENGINEERING DEPARTMENT REPORT
STATUS : Information Item
REPORT DATE : September 1, 2018
PREPARED BY : Missy Pieri, Engineering Manager/District Engineer

Significant assignments and activities for the Engineering Department are summarized below. I will be available at the meeting to answer questions and/or provide additional details.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PROJECT 2030 Water Main Replacement Project	Engineering	Engineering Manager and Project Manager	On-going	Yes, 09/19/18 (30% Completion Update)	Yes	2017-2018 Masterplan for replacement of mains installed in 1960-1985.	Asset Inventory and water demand projections in progress. CAC Workshop #2 was held on 08/28/18. 30% Presentation to the Board at the September Board Meeting.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
CAPITAL IMPROVEMENT PROJECT Corporation Yard / Facilities Master Plan Buildout	Engineering	Engineering Manager and Project Manager	On-going	Yes, TBD	Yes	2017-18 Masterplan for office space requirements through 2040.	Staff continues to review Space Needs Assessment completed by consultant. Additional meetings scheduled with the goal of presenting to the Board in Q4 2018.
CAPITAL IMPROVEMENT PROJECT Highland Ave & Rosa Vista Ln 8" Water Mains	Engineering	Senior Construction Inspector and Project Manager	On-going	Yes, 06/20/18 (Notice of Completion) 10/17/18 (Easements)	Yes	2017 design and construction.	Award of Contract occurred at the 01/17/18 Board Meeting. Notice of Completion approved at 06/20/18 Board Meeting. Easements being prepared by District. Anticipate bringing to the Board at the October Board Meeting.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
CAPITAL IMPROVEMENT PROJECT Graham Cir and Circuit Dr 8" Water Mains	Engineering	Senior Construction Inspector and Project Manager	On-going	Yes, 04/18/18 (Award of Contract) Yes, 09/19/18 (Notice of Completion)	Yes	2017 design, 2018 construction.	Contract signed and work began on 05/21/18. 100% Complete. Notice of Completion will be brought to the Board at the September Board Meeting.
CAPITAL IMPROVEMENT PROJECT Wind Way and Longwood Way 8" Water Mains	Engineering	Project Manager and Assistant Engineer	On-going	Yes, TBD	Yes	2017 design, 2018 construction.	Received response from Division of Drinking Water on 07/30/18. Awaiting response from City of Citrus Heights. Finalizing plans.
CAPITAL IMPROVEMENT PROJECT Pleasant View Drive 8" Water Main	Engineering	Project Manager and Assistant Engineer	On-going	Yes, TBD	Yes	2017 design, 2018 construction.	Plans sent to Engineer on 05/01/18. Potholing to be scheduled for September 2018.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
CAPITAL IMPROVEMENT PROJECT Michigan Drive 8" & 6" Water Mains	Engineering	Project Manager and Assistant Engineer	On-going	Yes, TBD	Yes	2017 design, 2018 construction.	Plans sent to Engineer on 05/02/18. Potholing completed. Preparing 90% plans. Staff to verify easements.
CAPITAL IMPROVEMENT PROJECT 6230 Sylvan Road East Side Wall	Engineering	Project Manager and Assistant Engineer	On-going	Yes, TBD	No	Wall along the east side of District property.	We anticipate this project will be included in the 2019 Capital Improvement Program. Staff to begin communication with SJUSD during 2018.
PRIVATE DEVELOPMENT Northridge Grove - 5555 Mariposa Ave 47 Condominiums	Engineering	Senior Construction Inspector and Engineering Manager	On-going	Yes, TBD	No	Private development.	District met on 03/01/18. District sent cost-sharing agreement for system improvements made in conjunction with the project on 05/23/18. District to respond.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT Dignity Health Building - 7115 Greenback Ln	Engineering	Engineering Manager and Senior Construction Inspector	On-going	Yes, TBD	No	Medical office building by developer.	Project complete. Perform project closeout. District provided comments to the draft easement received from the City on 08/01/18. Awaiting response from the City.
PRIVATE DEVELOPMENT 3 lot Residential Subdivision - 5648-5696 San Juan Ave	Engineering	Senior Construction Inspector	On-going	No	No	3 lot subdivision.	Preconstruction meeting occurred on 03/12/18. Construction in progress. 75% Complete.
PRIVATE DEVELOPMENT Mitchell Farms - 7925 Arcadia Drive	Engineering	Engineering Manager and Assistant Engineer	On-going	Yes, TBD	No	200-300 unit development by Watt Communities.	District submitted Conditions of Approval for the project on 05/07/18. Engineer preparing Improvement Plans for proposed land exchange.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT Mariposa Creek Subdivision - Antelope Road	Engineering	Senior Construction Inspector and Engineering Manager	On-going	No	No	15 lot subdivision located on Antelope Road.	Final plans received on 01/23/18. Developer grading site. Water preconstruction meeting occurred on 06/25/18. 75% Complete.
PRIVATE DEVELOPMENT Citrus Place Subdivision	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	7 lot subdivision located near Wachtel Way & Talbot Way.	Received updated plans from engineer on 04/30/18. District sent back comments on 05/22/18. Awaiting a resubmittal.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT 7581 Sycamore Dr - Parcel Split 1 - 3	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Parcel being split into 3 for 3 home subdivision.	Engineer submitted revised plans on 03/22/18. Comments sent to engineer on 04/04/18. Resubmittal received on 05/02/18. Comments sent to engineer on 06/04/18.
PRIVATE DEVELOPMENT 8053 Holly Dr - Parcel Split 1 - 3	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Parcel being split into 3 for 3 home subdivision.	Final plans signed and fees received on 05/10/18. Awaiting final plans.
PRIVATE DEVELOPMENT 7601 Sunrise Blvd The Human Bean	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development.	District signed plans on 12/21/17. Awaiting construction.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT 6920 Auburn Blvd Stock Ranch Plaza - Parcel 11	Engineering	Senior Construction Inspector	On-going	No	No	Commercial Development.	Received easement information on 11/30/17. Signed plans on 02/26/18. Preconstruction meeting on 04/30/18. Awaiting easements for entire Stock Ranch area.
PRIVATE DEVELOPMENT 7030 Auburn Blvd Stock Ranch - Traffic Circulation	Engineering	Senior Construction Inspector	On-going	No	No	Commercial Development.	Plans signed on 02/26/18. Fees paid on 05/22/18. 95% Complete. Awaiting easements for entire Stock Ranch area.
PRIVATE DEVELOPMENT 7766 Auburn Blvd Quick Slice	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development.	Sent comments to City on 11/27/17. Awaiting final plans from developer for District review.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT 6199 Sunrise Blvd US Bank Parcel Split	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development.	Sent Will Serve letter on 12/27/17. Awaiting to determine if developer/owner chooses to split the parcel.
PRIVATE DEVELOPMENT 8501 Auburn Blvd Big Lots	Engineering	Senior Construction Inspector and Engineering Manager	On-going	No	No	Commercial Development.	Plans signed on 08/23/18. Reviewing material submittals. Awaiting construction. Review easements for project.
PRIVATE DEVELOPMENT 8501 Auburn Blvd Studio Movie Grill	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Commercial Development. Potential parcel split from one parcel to four parcels.	Sent Will Serve letter on 12/28/17. Awaiting plans from developer for District review. Review easements for project.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
PRIVATE DEVELOPMENT 7312 Veterans Lane	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Single Family Home on a private street.	Sent review comments on 08/03/18. Awaiting revised plans and payment from customer.
PRIVATE DEVELOPMENT 103 Lazy Oak	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Single Family Home	Awaiting payment from customer.
COMCAST	Engineering	Assistant Engineer and GIS Specialist	On-going	No	No	Various communications boring projects throughout the service area.	District has provided water utility maps for all requested projects. Awaiting resubmittal from Comcast Engineer. Awaiting as-builts on all completed projects.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
CITY OF CITRUS HEIGHTS PROJECT City Drainage Project	Engineering	Engineering Manager and Assistant Engineer	On-going	Yes, TBD	Yes	Highland Ave, Wonder St, Dana Butte Way, and Sunhill Dr Storm Drain Project.	Anticipate bid and start of construction in Summer 2018. "B" Plans sent back 08/21/17 with comments. Coordinating utility conflicts and possible easement.
CITY OF CITRUS HEIGHTS PROJECT Bonita, Old Auburn Rd, & Mariposa Ave Storm Drain Improvements	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Bonita Way, Old Auburn Road, & Mariposa Ave Storm Drain Project.	Received 30% plans at the meeting with Dokken Engineering on 05/21/18. District sent engineer data on 08/03/18.
CITY OF CITRUS HEIGHTS PROJECT Baird Way Storm Drain Improvements	Engineering	Operations and Senior Construction Inspector	On-going	Yes, TBD	Yes	Baird Way Storm Drain Project.	Construction complete by City contractor. This item is complete. Awaiting as-builts from the City.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
CITY OF CITRUS HEIGHTS PROJECT Sunrise Blvd Complete Streets Phase 2A (C16-142)	Engineering	Operations and Senior Construction Inspector	On-going	Yes, TBD	Yes	Frontage improvements along west side of Sunrise from Sayonara to north and Storm Drain Improvements.	Attended preconstruction meeting on 03/14/18. Construction in progress by City contractor. CHWD 70% complete with water facility relocations. Need to coordinate valve raising with contractor.
CITY OF CITRUS HEIGHTS PROJECT Mariposa Ave - Safe Routes to School Phase III	Engineering	Engineering Manager and Assistant Engineer	On-going	Yes, TBD	Yes	Frontage improvements along west side of Mariposa Ave from Northridge to Eastgate.	Received signed Utility Agreement. Start of construction in Summer 2018. Received plans for review on 05/17/18. Pre-bid meeting on 06/05/18. District awaiting final plans.
CALIFORNIA DEPT OF TRANSPORTATION Weigh Station at I-80 & Antelope	Engineering	Engineering Manager and Assistant Engineer	On-going	No	No	Weigh station and off-ramp Improvements.	Sent water facility maps and as-builts to Engineer on 11/20/17. Awaiting plans from CalTrans for District review.

Items of Interest	Department	Project Team	Date	To Board? If so, Date	Strategic Planning Item	Item Description	Update from Last Report/ Current Status
Annexations	Engineering	Engineering Manager, Project Manager and Assistant Engineer	2018	Yes, TBD	Yes	Annex properties into the District to clarify and revise District boundaries.	Staff conducted an initial scoping meeting in April. Staff is now working on a draft RFP for consultant services. A follow-up meeting is scheduled for 10/24/18.
Easements	Engineering	Engineering Manager, Project Manager and Assistant Engineer	2018	Yes, TBD	Yes	Research and review District facility locations and easements for potential additions/revisions.	Staff conducted an initial scoping meeting in April. Staff is now working on a draft RFP for consultant services. A follow-up meeting is scheduled for 09/24/18.

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT : OPERATIONS DEPARTMENT REPORT
STATUS : Information Item
REPORT DATE : September 6, 2018
PREPARED BY : David M. Gordon, Operations Manager
Tim Cutler, Water Distribution Supervisor

Facilities Maintenance

	Completed WO's	
	Current Mth	**Year to Date**
Backflow Maintenance	0	0
Blow Off Maintenance	0	1
Hydrant Maintenance	45	196
Leak Investigation	0	2
Mainline Repair/Maintenance	3	5
Meter Box Maintenance	5	34
Meter Register Replacement	16	111
Meter Repair/ Test/Maintenance	1	24
Pot Hole Work	0	1
Water Service Repair/Locate	0	2
Valve, Mainline Maintenance	85	351
Valve Box Maintenance	1	4
TOTAL	**156**	**731**

CIP Projects

	Completed WO's	
	Current Mth	**Year to Date**
C18-010 Water Mainline	0	0
C18-011 Water Valves	1	6
C18-012 Water Services	40	224
C18-013 Water Meters	17	114
C18-014 Fire Hydrants	1	9
TOTAL	**59**	**353**

Water Quality

Water Analysis Report: Bacteriological testing has met all California Department of Public Health requirements. 72 samples were collected with no positive results.

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS

SEPTEMBER 19, 2018 MEETING

SUBJECT : 2018 WATER SUPPLY - PURCHASED & PRODUCED
STATUS : Information Item
REPORT DATE : September 7, 2018
PREPARED BY : Brian M. Hensley, Water Resources Supervisor
David M. Gordon, Operations Manager

OBJECTIVE:

Report on annual water supply including comparison with prior years.

Month	2013	2014	2015	2016	2017	2018				Year-to-Date Comparison to 2013	
	Total Water Monthly					Surface Water Purchased	Ground Water Produced	Total Water Monthly	Total Water Annual		
	acre feet					acre feet				acre feet	%
Month											
Jan	602.52	602.39	570.05	539.60	506.81	481.10	50.28	531.38	531.38	-71.14	-11.8%
Feb	606.36	450.96	511.52	484.53	443.99	477.82	47.91	525.73	1,057.11	-151.77	-12.6%
Mar	819.55	612.20	725.95	517.56	546.60	511.13	29.65	540.78	1,597.89	-430.54	-21.2%
Apr	1,029.73	737.30	761.02	677.81	575.52	628.36	17.73	646.09	2,243.98	-814.18	-26.6%
May	1,603.43	1,190.07	869.08	979.49	1,138.72	1,027.12	45.15	1,072.27	3,316.25	-1,345.34	-28.9%
Jun	1,816.73	1,548.66	1,065.10	1,343.76	1,412.94	1,356.78	30.25	1,387.03	4,703.28	-1,775.04	-27.4%
Jul	2,059.21	1,622.10	1,184.95	1,544.57	1,650.76	1,367.09	370.04	1,737.13	6,440.41	-2,097.12	-24.6%
Aug	1,924.28	1,477.49	1,188.18	1,579.80	1,570.80	977.12	606.66	1,583.78	8,024.19	-2,437.62	-23.3%
Sep	1,509.82	1,275.11	1,069.78	1,257.91	1,441.76						
Oct	1,297.42	1,030.74	918.67	840.80	1,128.97						
Nov	911.55	682.48	589.6	561.82	631.55						
Dec	700.94	563.15	519.57	518.62	574.43						
Total	14,881.54	11,792.65	9,973.47	10,846.27	11,622.85	6,826.52	1,197.67	8,024.19	8,024.19		
% of Total						85.07%	14.93%				

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT	:	WATER SUPPLY RELIABILITY
STATUS	:	Information Item
REPORT DATE	:	September 10, 2018
PREPARED BY	:	David M. Gordon, Operations Manager Brian Hensley, Water Resources Supervisor

OBJECTIVE:
Receive status report on surface water supplies available to the Citrus Heights Water District (District).

BACKGROUND AND ANALYSIS:
As of September 1, 2018, storage in Folsom Lake (Lake) was at 505,200 acre-feet, 51 percent of the total capacity of 977,000 acre-feet. This represents a decrease in storage of 125,700 acre-feet in the past month.

The District's total water use during the month of August 2018 (1,583.78 acre-feet) was 17.7 percent below that of August 2013 (1,924.28 acre-feet).

The District continues to assist with preserving surface water supplies in the Lake by operating its groundwater wells. The District's groundwater production wells: Bonita, Skycrest, and Sylvan, are operational and used on a rotational or as-needed basis. Other District groundwater production wells: Mitchell Farms, Palm, and Sunrise are at various stages of repairs.

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT : WATER EFFICIENCY & SAFETY PROGRAM UPDATE
STATUS : Information Item
REPORT DATE : September 5, 2018
PREPARED BY : Rex W. Meurer, Water Efficiency Supervisor

Water Efficiency, Safety and Meter Program updates are summarized below.

ACTIVITIES AND PROGRESS REPORT

Water Efficiency, Safety and Meter Program activities during the month of August 2018 include:

- 16 Ultra-Low-Flush Toilet (ULFT) rebates were processed for the month of August. This compares to 33 rebates issued for the month of August 2017. The 5 year average (2013-2017) of August ULFT rebates is 15. A total of $7,650.00 in rebates were issued year to date.

- A total of 7 High Efficiency Clothes Washer (HECW) rebates were issued during the second quarter of 2018. This compares to 3 HECW rebates issued for the second quarter of 2017. To better align with SMUD's schedule for reporting monthly numbers, staff is reporting HECW rebates on a quarterly basis.

- 41 service calls were received during the month of August. There were no reports of water waste received through CHWD's Drought Resources web page. A total of 180 service calls were received year to date.

- The next WaterSmart class will be on Thursday, September 27 from 6:00 pm – 8:30pm. The class is titled "Pruning and Maintaining Your WaterSmart Landscape". Classes are held at the Citrus Heights Community Center located at 6300 Fountain Square Drive. This will be the final class in a series of 5 classes held by the District this year.

- CHWD began a telephone outreach campaign promoting the District's free Irrigation Efficiency Reviews. WaterWise Consulting is working with staff to contact many of CHWD's high water use customers. WaterWise has completed reaching out to CHWD's single-family customers. Staff has shifted the focus of the outreach campaign to multi-family customers. Due to this effort, a total of 1 multi-family Irrigation Efficiency Review was generated and completed for the month of August. For the customers who have completed an Irrigation Efficiency Review during this outreach campaign, staff will conduct a year-over-year comparison of their water usage. A presentation will be provided to the Board for a complete recap of the findings during the fourth quarter of 2018. A total of 85 Irrigation Efficiency Reviews have been completed since the outreach campaign began in December 2017. This compares to 44 Irrigation Efficiency Reviews completed for the same time in December 2016 thru August 2017.

- Staff completed a meter testing program for all meters 3 inches and larger. The testing is part of the Water Loss Program requirement contained in SB555. The meters were tested for accuracy during

high, medium and low flow conditions. The testing program was completed on July 17. 80 meters fit within the testing parameters, and through the process of elimination, 67 meters were identified for testing. During testing, staff encountered issues at several sites that prohibited testing. A total of fifty-two 3 inch and larger meters were tested. Of the meters tested, 31 are within California standards (reference AWWA M6 Manual), 6 were very close to standards and 15 tested below standard and need to be repaired or replaced. Staff is currently analyzing the test results and determining a repair/replacement schedule for failing meters. The remaining 15 untested meters are being assessed for needed improvements to allow for future testing.

- On Thursday, August 9, staff completed the seventh presentation in the annual group participation safety program. The presentation topic was "CHPD's Problem Oriented Policing (POP) Unit". The presenters included Missy Pieri, John Spinella and Kelly Drake.

- The following table summarizes the Residential Gallons Per Capita Per Day (R-GPCD) values for CHWD to date:

Month	R-GPCD 2017	R-GPCD 2018	% CHANGE
January	75	77	+3%
February	72	85	+18%
March	80	79	-.01%
April	87	100	+13%
May	166	156	-.06%
June	209	213	-.02%
July	241	253	+.05%
August	229	231	+.01%

- Since 2013, RWA has been providing the District with a summary of the region's individual Agency R-GPCD for the current month/year, including a year to date comparison for 2013. RWA has reformatted the monthly update and will no longer be providing the regional water savings comparison.

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT : DISCUSSION AND POSSIBLE ACTION TO CONSIDER ACCEPTANCE OF THE GRAHAM CIRCLE AND CIRCUIT DRIVE WATER MAIN REPLACEMENT PROJECT
STATUS : Action Item
REPORT DATE : August 30, 2018
PREPARED BY : Missy Pieri, Engineering Manager/District Engineer

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OBJECTIVE:
Consider adoption of Resolution 14-2018 accepting the Graham Circle and Circuit Drive Water Main Replacement Project, and authorize execution and recording of a Notice of Completion for the Project.

BACKGROUND AND ANALYSIS:
At the April 18, 2018 Board Meeting, a contract was approved with Lund Construction, Inc. for installing and connecting approximately 776 linear feet of 8-inch water main, 1,152 linear feet of 6-inch water main, five (5) 6-inch gate valves, four (4) steamer fire hydrants, one (1) 1-inch air/vacuum valve, two (2) 1-inch metered water services, and twenty five (25) 1-inch water services with curb stops along Graham Circle and Circuit Drive in the City of Citrus Heights.

The original construction contract amount was $497,499.50 with a contingency fund in the amount of $49,750.00 (10.0%). The final amount paid to the contractor is $510,759.10 for material, labor and equipment. The final construction cost from the original bid amount includes variations between the bid item estimates and the actual totals measured, including different pipe material installed and additional paving. The variations total an additional cost of $13,259.60 or 26.7% of the contingency fund.

The requested action is to approve the accompanying Notice of Completion (Attachment 1) and Resolution accepting the Graham Circle and Circuit Drive Water Main Replacement Project (Attachment 2) to complete this Capital Project.

RECOMMENDATION:
Adopt Resolution 14-2018 accepting the Graham Circle and Circuit Drive Water Main Replacement Project, and authorize the execution and recording of a Notice of Completion for the Project.

ATTACHMENTS:
1. Notice of Completion for Graham Circle and Circuit Drive Water Main Replacement Project
2. Resolution of the Board of Directors Accepting Graham Circle and Circuit Drive Water Main Replacement Project (Resolution 14-2018)

ACTION:

Moved by Director _____, Seconded by Director _____, Carried _____

ATTACHMENT 1

Notice of Completion for
Graham Circle and Circuit Drive
Water Main Replacement Project

RECORDED AT THE REQUEST OF
OWNER AND RETURN TO:

CITRUS HEIGHTS WATER DISTRICT
P.O. BOX 286
CITRUS HEIGHTS, CA 95611-0286

NO FEE FOR RECORDING
(Government Code Section 6103) Space above for Recorders use only

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NOTICE OF COMPLETION FOR
GRAHAM CIRCLE AND CIRCUIT DRIVE WATER MAIN REPLACEMENT PROJECT

1. *Project Name:* Graham Circle and Circuit Drive Water Main Replacement Project C15-132

2. *Prime Contractor:* Lund Construction Company of North Highlands, California

3. *Date of Contract:* May 16, 2018

4. *Date of Final Inspection and Completion:* August 13, 2018

5. *Site Locations:* Within Graham Circle, a public road in the City of Citrus Heights, California, from Circuit Drive (West) to Circuit Drive (East). Within Circuit Drive, a public road in the City of Citrus Heights, California, from 80 feet east of Graham Circle (East) extending easterly and northerly approximately 730 feet to Mariposa Avenue.

6. *Description of Work or Materials Furnished:* The work performed consisted, in general, of installing potable water mains, water valves, a fire hydrants, water services and related appurtenances including excavation, trench backfill and associated surface restorations and all other work described pursuant to the contract plans and specifications on file with Citrus Heights Water District.

7. *Owner's Property Interest in Site is:* vendee under contract

8. *Owner:* Citrus Heights Water District

9. *Signature for Owner:* _____
Hilary M. Straus, General Manager/Secretary
Citrus Heights Water District

VERIFICATION

I hereby verify, under the penalty of perjury, that Hilary M. Straus signed the foregoing Notice of Completion and that the facts and contents therein are true and correct to the best of my knowledge.

DATE: September 19, 2018 _____
Christopher Castruita, Management Services
Supervisor/Chief Board Clerk
Citrus Heights Water District

ATTACHMENT 2

Resolution of the Board of Directors
Accepting
Graham Circle and Circuit Drive
Water Main Replacement Project
Resolution 14-2018

CITRUS HEIGHTS WATER DISTRICT
RESOLUTION NO. 14-2018

RESOLUTION OF THE BOARD OF DIRECTORS
ACCEPTING
GRAHAM CIRCLE AND CIRCUIT DRIVE
WATER MAIN REPLACEMENT PROJECT

WHEREAS, on April 18, 2018 the Board of Directors of the Citrus Heights Water District authorized the award of a contract to Lund Construction, Inc. for the Graham Circle and Circuit Drive Water Main Replacement Project; and

WHEREAS, on May 16, 2018 the contract was fully executed between the District and Lund Construction, Inc.; and

WHEREAS, Lund Construction, Inc. has completed the work for the Graham Circle and Circuit Drive Water Main Replacement Project in accordance with the plans, specifications and contract documents prepared by the District pursuant to a final inspection on August 13, 2018.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of Citrus Heights Water District that the Graham Circle and Circuit Drive Water Main Replacement Project is accepted as complete.

BE IT FURTHER RESOLVED that the District Secretary is authorized to execute a Notice of Completion for the Graham Circle and Circuit Drive Water Main Replacement Project and to have said Notice recorded with the Office of the Recorder of Sacramento County.

PASSED AND ADOPTED by the Board of Directors of the CITRUS HEIGHTS WATER DISTRICT this 19th day of September 2018 by the following vote, to wit:

AYES: Directors:
NOES: Directors:
ABSTAIN: Directors:
ABSENT: Directors:

_____
RAYMOND RIEHLE, President
Board of Directors
Citrus Heights Water District

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of Resolution 14-2018 adopted by the Board of Directors of Citrus Heights Water District at its regular meeting held September 19, 2018.

_____

Christopher Castruita, Chief Board Clerk
Citrus Heights Water District

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT : DISCUSSION AND POSSIBLE ACTION TO APPROVE THE AMERICAN RIVER BASIN INTEGRATED REGIONAL WATER MANAGEMENT PLAN
STATUS : Action Item
REPORT DATE : September 12, 2018
PREPARED BY : David M. Gordon, Operations Manager

OBJECTIVE:
Consider approval of Resolution 15-2018 for the approval of the American River Basin Integrated Regional Water Management Plan.

BACKGROUND AND ANALYSIS:
On July 12, 2018, the Regional Water Authority (RWA) Board, acting as the authorized Regional Water Management Group for the American River Basin (ARB), adopted a comprehensive update to the ARB Integrated Regional Water Management Plan (IRWMP). The update was prepared in response to new IRWMP guidelines released by the California Department of Water Resources (DWR) associated with Integrated Regional Water Management (IRWM) grant funds authorized through Proposition 1, which passed in 2014. The updated IRWMP is required for eligibility to pursue grant funds through Proposition 1. DWR expects to release a draft grant application package in October for public comment.

The ARB IRWMP was submitted to DWR and is currently under review. One of the key eligibility requirements for any project proponent interested in pursuing IRWM grant funding is that the proponent also adopt the ARB IRWMP. This applies to all agencies, even members of RWA who adopted the 2013 version of the ARB IRWMP.

Citrus Heights Water District (District) has submitted multiple grant applications to DWR through the IRWMP that aligns with IRWMP's vision, principles, goals and objectives. Adoption of this Resolution is critical to the success of potentially receiving grant funds. Adoption of the ARB IRWMP does not assume responsibility for the plan's implementation, but rather affirms the District's commitment.

District-submitted grant applications (pending approval) include:

1. 42 Inch Transmission Water Main Creek Crossing
2. Carriage/Lauppe Transmission Main Project
3. Ella Way Groundwater Production Well Project
4. Highland Avenue Groundwater Production Well Project
5. Groundwater Production #9 Well Project

RECOMMENDATION:
Adopt Resolution 15-2018 American River Basin Integrated Regional Water Management Plan.

ATTACHMENTS:

1. Resolution of the Board of Directors Adopting American River Basin Integrated Regional Water Management Plan (Resolution 15-2018)
2. American River Basin Integrated Regional Water Management Plan – 2018 Update

ACTION:

Moved by Director _____, Seconded by Director _____, Carried _____

ATTACHMENT 1

Resolution of the Board of Directors Adopting American River Basin Integrated Regional Water Management Plan (Resolution 15-2018)

CITRUS HEIGHTS WATER DISTRICT
RESOLUTION NO. 15-2018

RESOLUTION OF THE BOARD OF DIRECTORS
ADOPTING
AMERICAN RIVER BASIN
INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

WHEREAS, the stakeholders of the American River Basin (ARB) support a vision of responsibly managing water resources for the lasting health of the region's community, economy, and environment;

WHEREAS, the stakeholders of the American River Basin recognize the development and implementation of an Integrated Regional Water Management Plan (IRWMP) will support realization of this vision;

WHEREAS, Regional Water Authority (RWA) was designated in November 2009 by the California Department of Water Resources (DWR) as the Regional Water Management Group (RWMG) authorized to prepare and implement an IRWMP within the ARB planning area;

WHEREAS, since November 2009, RWA has collaborated extensively with regional stakeholders to develop a vision, principles, goals, and objectives to support the ARB IRWMP;

WHEREAS, the ARB IRWMP is not a legally binding document on the stakeholders adopting the plan, but rather serves as a framework for coordinated planning in the region;

WHEREAS, the ARB IRWMP is a living document, with defined processes for updating plan components;

WHEREAS, RWA, serving as the RWMG, adopted an update to the ARB IRWMP at a public meeting held on July 12, 2018.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of Citrus Heights Water District hereby adopts the ARB IRWMP (Exhibit A) that provides a broadly supported vision, principles, goals, and objectives to help ensure sustainable water resources in the region.

BE IT FURTHER RESOLVED that Citrus Heights Water District will strive to ensure that projects it submits into the ARB IRWMP have considered opportunities for achieving integrated benefits. Furthermore, Citrus Heights Water District will update information on any of its projects included in the ARB IRWMP on at least an annual basis.

PASSED AND ADOPTED by the Board of Directors of the CITRUS HEIGHTS WATER DISTRICT this 19th day of September 2018 by the following vote, to wit:

AYES: Directors:
NOES: Directors:
ABSTAIN: Directors:
ABSENT: Directors:

RAYMOND RIEHLE, President
Board of Directors
Citrus Heights Water District

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of Resolution 15-2018 adopted by the Board of Directors of Citrus Heights Water District at its regular meeting held September 19, 2018.

CHRISTOPHER CASTRUITA,
Chief Board Clerk
Citrus Heights Water District

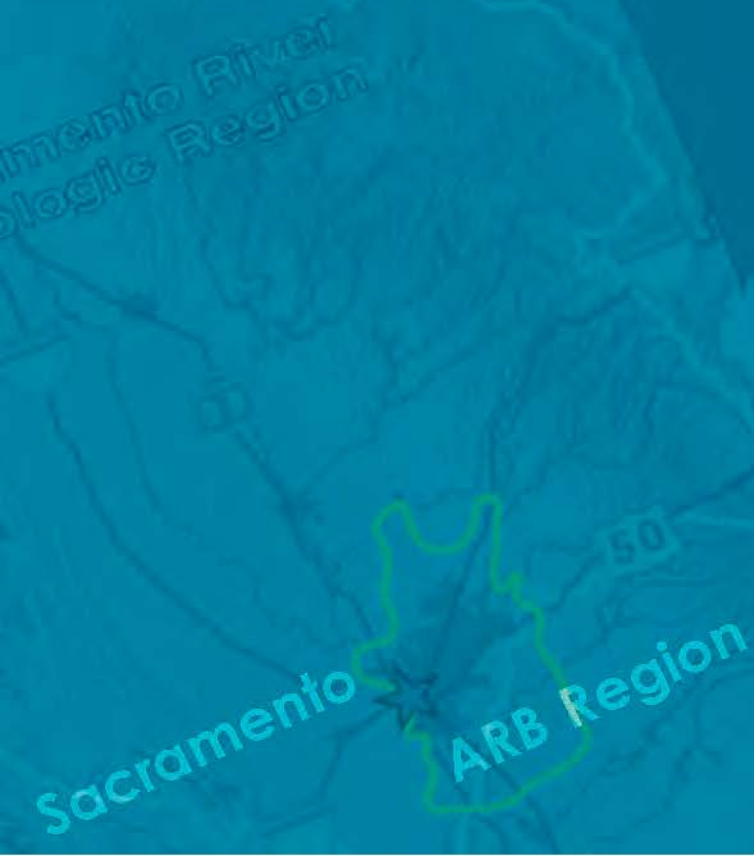
ATTACHMENT 2

American River Basin
Integrated Regional Water Management Plan
2018 Update

OVERVIEW OF THE

American River Basin Integrated Regional Water Management Plan

2018 UPDATE



Introduction

The 2018 **American River Basin (ARB) Integrated Regional Water Management Plan (IRWMP)** Update was prepared by the Regional Water Authority (RWA) with significant input from stakeholders in the ARB Region (Region). This overview document summarizes the content of the 2018 ARB IRWMP Update and highlights significant changes from the 2013 Update.

Successful implementation of the ARB IRWMP will help achieve the Region's water resources vision of providing for the lasting health of our community, economy, and environment. The strong foundation created by the ARB IRWMP will continue to guide water resources management efforts to both our present and our future benefit.

History of Regional Planning in the Greater Sacramento Area

The greater Sacramento area has been active in integrated water planning and implementation for over two decades. In 1993, a diverse group of stakeholders began a seven year facilitated effort to develop regional solutions to meet municipal, agricultural, and environmental water needs. More than 40 signatories signed the Water Forum Agreement (WFA) in 2000, which includes the coequal objectives of: (1) providing water reliability for planned development to the year 2030, and (2) protecting and preserving the lower American River. The WFA remains the foundation of regional integrated planning to this day.

In 2001, water suppliers in the Sacramento area formed RWA as a joint powers authority in part to help implement elements of the WFA. RWA developed the first ARB IRWMP in 2006 and completed the first ARB IRWMP update in 2013.

2018 ARB IRWMP Update

Integrated Regional Water Management (IRWM) is an effective way to address complex water resources challenges. IRWM is driven by stakeholders that identify major water and related resource management issues and their proposed solutions. It maximizes economic and societal benefits in an equitable manner, while maintaining the ecosystem critical to water resource sustainability.

The 2018 ARB IRWMP is a comprehensive update of the 2013 IRWMP. It builds upon the IRWMP "Framework" and tools developed as part of the 2006 and 2013 IRWMPs, as well as local and regional planning efforts. This includes the North American Basin Regional Drought Contingency Plan, Regional Water Reliability Plan, Sacramento and San Joaquin Rivers Basin Study, and local climate action and sustainability plans. The 2018 ARB IRWMP Update also addresses the 2016 IRWMP Standards, highlights regional accomplishments in IRWM planning, and identifies actions to adapt to and mitigate the impacts of climate change. Significant events and regional accomplishment from the 2013 to the 2018 ARB IRWMP Update are summarized on the following page.

History of Events from the 2013 to 2018 ARB IRWMP Updates

2014
Drought State of Emergency declared.

- Sustainable Groundwater Management Act passes.
- Prop 1 Water Bond (AB 1471) passes, authorizing $7.55 billion in funds for supply and watershed protection projects, with $510 million dedicated for integrated regional water management planning.
- Senate Bill 985 passes, requiring agencies to develop stormwater resource plans to receive Prop 1 funds.
- RWA receives $9.8 million Prop 84 grant award on behalf of local agencies and organization to implement 17 projects addressing drought resiliency/adaptation.

2015

- Water right curtailments throughout California.
- Mandatory 25% statewide reduction in water use are enacted.
- PCWA receives $200,000 Reclamation WaterSMART grant on behalf of local agencies to develop North American Basin RDCP.
- RWA receives $1.7 million Prop 84 grant award on behalf of local agencies and organizations to implement four priority projects in 2013 ARB IRWMP Update.
- Water levels in Folsom Reservoir reach a record low of 135,000 acre-feet, threatening water supplies and ecosystems of the American River Basin and system-wide.

2016

- Sacramento and San Joaquin Rivers Basin Study is completed by Reclamation with partners.
- Governor issues Executive Order B-37-16, directing the establishment of long-term conservation standards.
- North American Basin Drought Planning Task Force is formed through RWA.
- Region receives $650,000 WaterSMART grant award to develop American River Basin Study as local follow-up to the Sacramento and San Joaquin Rivers Basin Study.

2017
Drought State of Emergency lifted.

- Sacramento River Funding Area receives $3.7 million Prop 1 grant award to ensure DAC involvement in IRWM planning efforts.
- RWA receives $250,000 Prop 1 planning grant award on behalf of local agencies and organizations to update 2013 ARB IRWMP.
- RWA holds initial stakeholder meetings to commence comprehensive ARB 2018 IRWMP Update.
- GSAs are formed.
- El Dorado County Water Agency receives $400,000 Reclamation WaterSMART grant award on behalf of local agencies and organization to develop ARB Water Marketing Strategy.
- North American Basin RDCP is completed.

2018

- Local flooding in parts of the Region. Sacramento Weir opened for first time in over a decade.
- Local groundwater management authorities receive $3 million in funding for development of groundwater sustainability plans for the North American, South American, and Cosumnes Subbasins.
- Prop 68 passes, authorizing $1.19 billion in funding for water infrastructure and flooding projects.
- Regional Water Reliability Plan completed by RWA.
- ARB SWRP and West Slope SWRP are finalized and adopted.
- 2018 ARB IRWMP Update is finalized and adopted following four stakeholder workshops over two years.

LEGEND

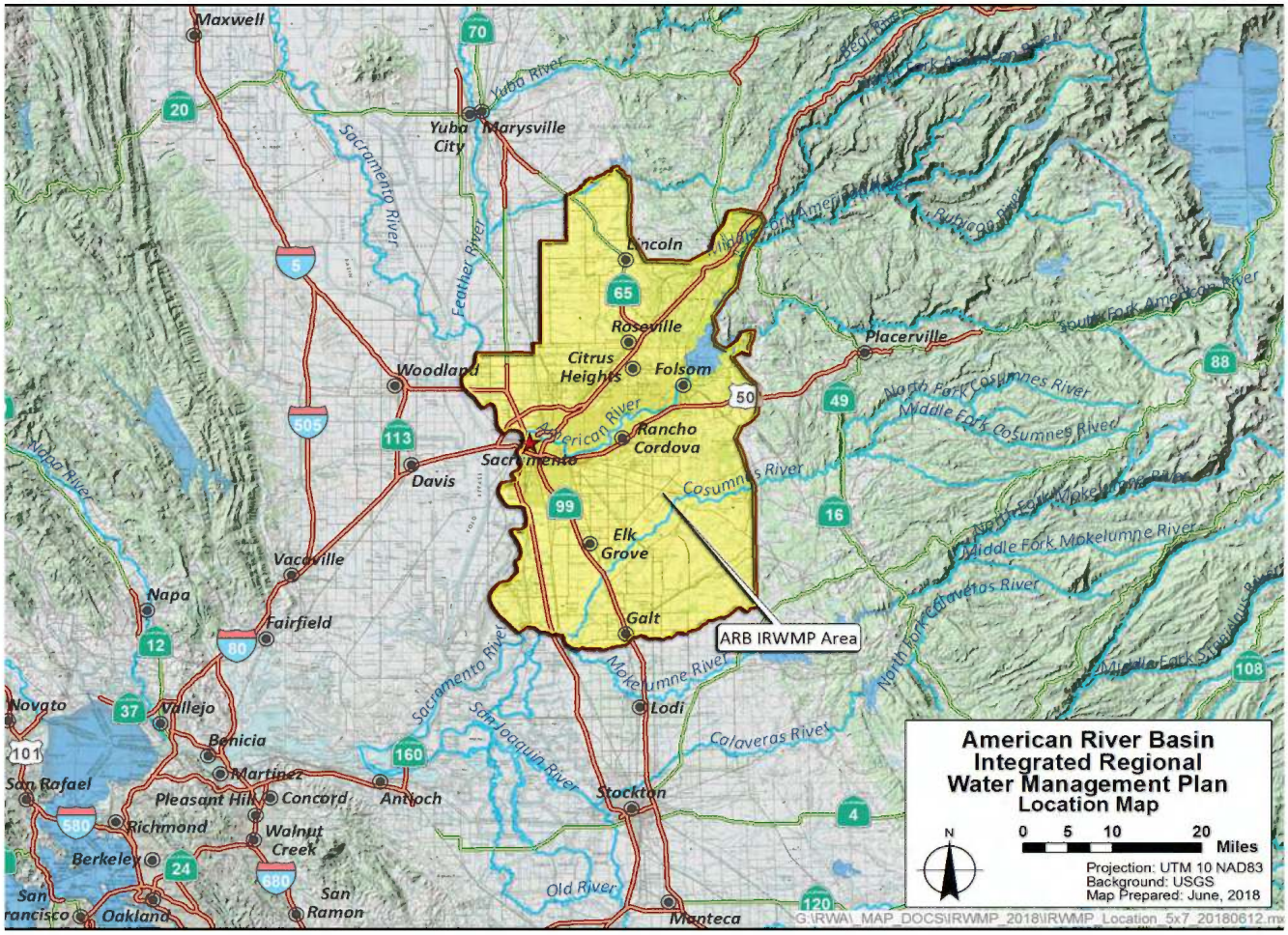
AB	Assembly Bill	Prop	Proposition
ARB	American River Basin	RDCP	Regional Drought Contingency Plan
DAC	disadvantaged community	Reclamation	U.S. Department of the Interior, Bureau of Reclamation
GSA	Groundwater Sustainability Agency	RWA	Regional Water Authority
GSP	Groundwater Sustainability Plan	SAFCA	Sacramento Area Flood Control Agency
IRWMP	Integrated Regional Water Management Plan	SWRP	Storm Water Resource Plan

ARB Region

The ARB Region encompasses the greater Sacramento area. It includes most of Sacramento County and the western portions of Placer and El Dorado counties. The Region's boundaries are shown below.

Changes from 2013 ARB IRWMP:

- Updated ARB Region boundaries to include portions of western Placer County that were previously excluded.



Water Resource Management Challenges

The Region faces many challenges to maintaining a sustainable water resources system that supports a healthy community, economy, and environment. These challenges include: increased future demand to support growth amid an uncertain climate future; decreased reliability due to failures of an aging water supply infrastructure and changes in precipitation; increased constraints on water supply due to environmental and other regulations; and degraded ecosystems.

Changes from 2013 ARB IRWMP:

- Updated description of climate change vulnerabilities and resiliency and adaptation strategies.
- Added discussion on the drought's impacts to the Region.
- Added descriptions of regional planning efforts, including groundwater sustainability plans, Storm Water Resource Plans, North American Basin Regional Drought Contingency Plan, and Regional Water Reliability Plan.

ARB IRWM Governance

Participants at 2018 ARB IRWMP Update Workshop.

While RWA has the ultimate responsibility for developing and maintaining the ARB IRWMP as the Regional Water Management Group (RWMG), the **2018 ARB IRWMP Update was developed with significant input from the ARB stakeholders**. The 2018 ARB IRWMP Update was developed over a series of four public workshops and numerous communications with stakeholders. These workshops included participation from over 30 agencies representing a broad range of interests in the Region.

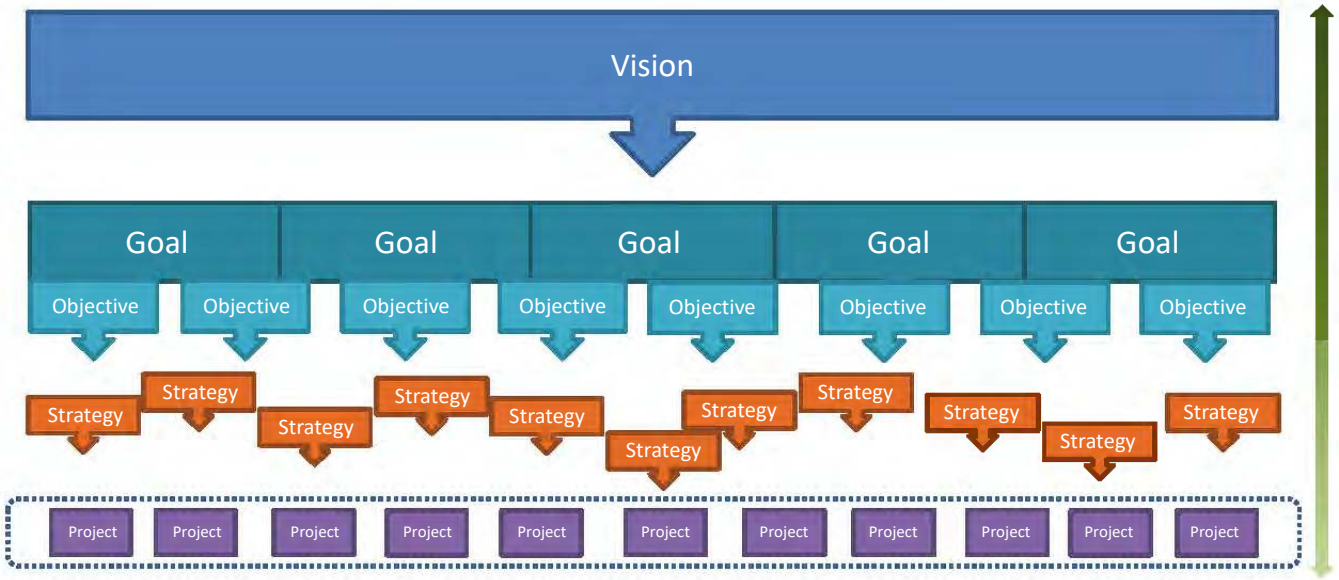
Collectively, this group of stakeholders serves as what is referred to as the Planning Forum. The Planning Forum will continue to convene during IRWMP implementation to discuss water-related issues and propose solutions. Also within the governance structure is an Advisory Committee. The Advisory Committee serves to ensure that stakeholders have an opportunity to participate in the IRWMP and makes recommendations related to the project vetting and scoring process. Individual stakeholders are responsible for implementing specific projects in the IRWMP.

Changes from 2013 ARB IRWMP:

- Updated role of Advisory Committee.

ARB IRWM Framework

The Framework serves as the heart of the ARB IRWMP. It lays out a **vision for the desired end result of the IRWM effort, guiding principles, goals, and objectives**. It also establishes a process for adding and modifying strategies and projects to help meet the goals and objectives of the IRWMP. The Framework provides for a living and adaptive IRWM process. ARB stakeholders and the RWA developed the Framework in 2013 (depicted below) and revised the goals, objectives, principles, and strategies in 2018 to reflect both accomplishments and changed conditions.



Changes from 2013 ARB IRWMP:

- Updated goals, objectives, principles, and strategies.
- Added a new principle to address the impacts of climate change and other uncertainties to the Region.
- Added a new objective to address the sustainable management of Region's groundwater resources.
- Added new strategies to address sustainable groundwater management, stormwater quality, conjunctive use, and engagement of agricultural stakeholders.
- Updated list of 'Parking Lot' strategies. Incorporated or elevated Parking Lot strategies, where feasible.
- Added a discussion describing how the IRWMP strategies address the impacts of climate change and other regional vulnerabilities.

Vision

The Region will responsibly manage water resources to provide for the lasting health of our community, economy, and environment.

Goals

To help realize the vision, the ARB stakeholders developed a series of regional goals.

1. Provide reliable and sustainable surface water and groundwater resources, sufficient to meet the existing and future needs of the Region.
2. Protect and enhance the quality of surface water and groundwater.
3. Protect and enhance the environmental resources of the watersheds within the Region.
4. Protect the people, property, and environmental resources of the Region from the impacts of flood damage.
5. Promote community stewardship of our Region's water resources.

Principles

Our principles are statements that articulate our shared values. They guide how stakeholders should view planning and implementation in the Region.

- Planning for sustainability of our water resources considers all aspects of our watershed.
- Achieving multiple benefits through further integration throughout our water resources planning.
- Employing adaptive management techniques and active monitoring to manage our water resources.
- Engaging a broader community as stewards of our water resources.
- Planning for hydrologic variability and uncertainty.

Objectives

Meeting our ARB IRWMP goals will depend on addressing 18 primary objectives developed with extensive stakeholder input.

GOAL AREA	OBJECTIVE
Water Resources	▪ Meet current and future water resources needs. ▪ Increase water use efficiency. ▪ Improve ability to reliably meet water needs during dry or emergency conditions. ▪ Increase the use of recycled water for appropriate uses. ▪ Manage the Region's groundwater basins sustainably.
Water Quality	▪ Remediate contaminated groundwater and reuse it to the extent feasible. ▪ Improve protection of beneficial uses of surface water and groundwater. ▪ Recharge and reuse stormwater and urban runoff to the extent practicable.
Environmental Resources	▪ Maintain and improve the ecosystem function of area streams and watersheds. ▪ Maintain and improve habitat of area watersheds. ▪ Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.
Flood Management	▪ Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses. ▪ Maintain and improve levees and other flood-related infrastructure to reduce flood risk. ▪ Maintain and restore/reconnect floodplains to provide flood storage and other benefits to reduce flood risk and increase groundwater recharge. ▪ Improve management of residual flood risks.
Community Stewardship	▪ Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources. ▪ Improve integration of water resources planning with land-use planning. ▪ Increase sharing of information, studies, and reports to further advance integrated regional water management.

Strategies

Strategies are specific approaches or methods for achieving our objectives and resolving specific issues. Strategies trigger action.

In contrast to vision, goals, principles, and objectives, strategies are dynamic. Strategies state a distinct target, quantifiable if possible, and a deadline to meet that target, if possible. Multiple strategies may help achieve an objective; likewise, a single strategy may help make progress toward multiple objectives and goals. Stakeholders may propose a new strategy at any time, and new strategies can be reviewed, vetted, and added to the IRWMP on a quarterly basis.

Projects

One of RWA's roles is to prioritize and promote projects that help implement the ARB IRWMP. This requires a project review process to help determine which projects are in the regional interest to promote and implement.

The project review process was developed with stakeholder input. Projects are given scores in two primary areas:

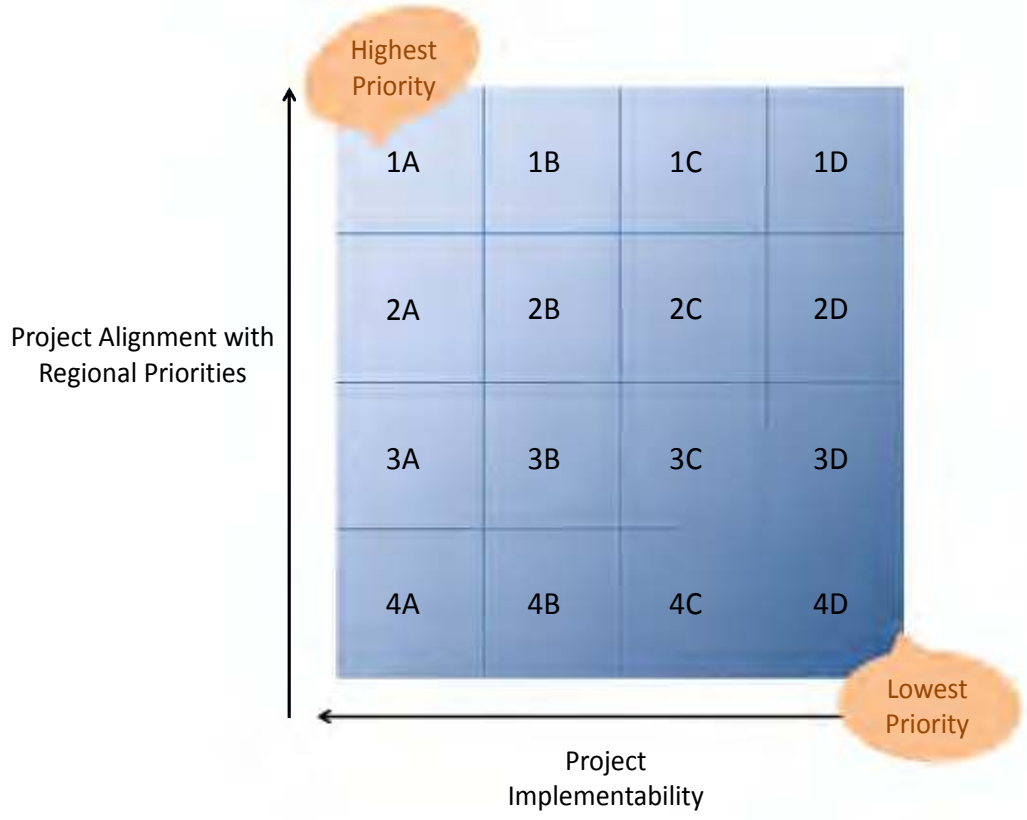
- **Project Alignment with Regional Priorities Score (rated 1 to 4)**

  This score considers how a project provides benefits to the region, as defined by (1) ARB goals and objectives, and (2) level of integration with other regional projects.

- **Project Implementability Score (A to D)**

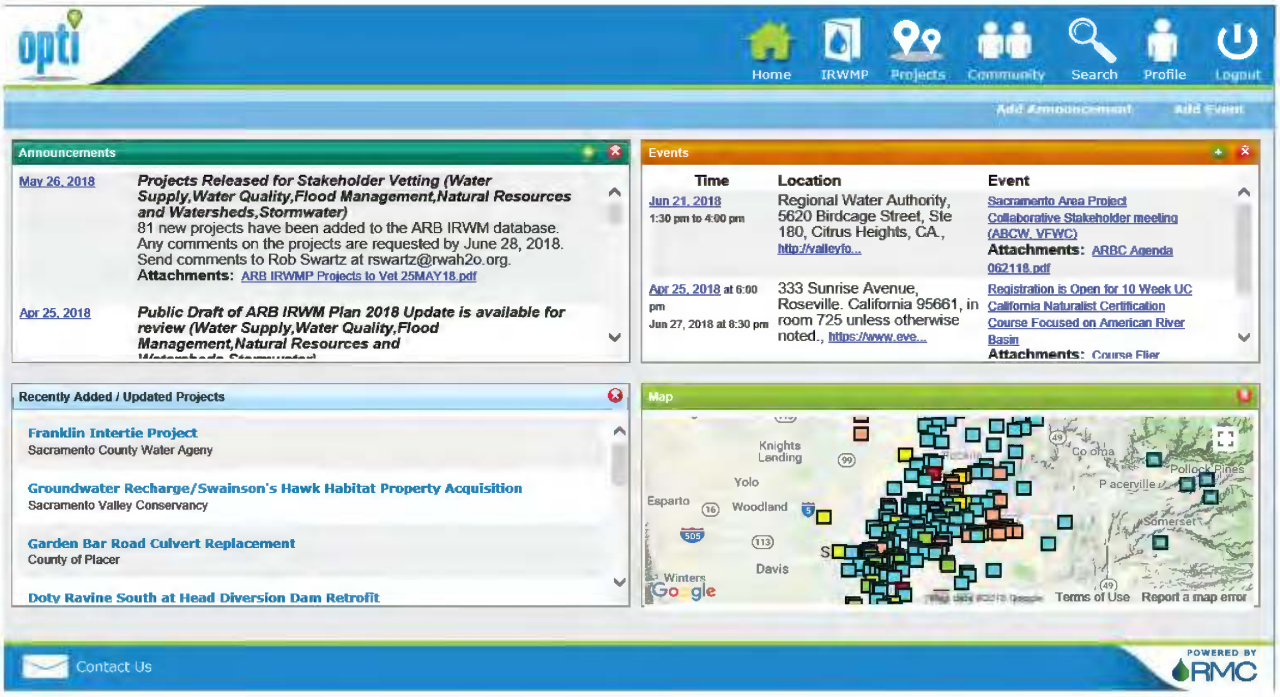
  This score considers the readiness for a project to proceed and its overall feasibility.

Based on scoring, projects are placed into one of 16 alphanumeric tiers. Projects in Tier 1A are considered the most aligned with regional priorities and most ready to proceed. Projects in Tier 4D would be least aligned to regional priorities and least ready to proceed. However, these rankings are not absolute with respect to a project's priority in the region. Project proponents may improve projects or update project information at any time to improve their ranking. Stakeholders also have an option to add a project without receiving a ranking. This encourages entering projects that might be in early development, which could expand opportunities for collaboration nearer the onset of project planning.



ARB IRWM Online Community

To help ensure an engaged stakeholder community during development and implementation of the ARB IRWMP, RWA developed Opti. Opti is an online planning community site where stakeholders can stay connected with issues related to IRWM. Community members can enter and share announcements, events, and information about IRWMP projects.



Opti promotes IRWM in the following ways:

- Opti provides a central location for sharing information (e.g., currently proposed ARB projects, upcoming meetings, water-related events, progress on IRWM).
- Using Opti fosters collaboration and builds a community.
- Opti efficiently collects and displays details of ARB project information in real time.
- Opti's map interface adds a spatial element for stakeholders to identify "where" potential partners are in the region.
- Opti is a project database that can be easily maintained and updated, ensuring a living IRWM process.
- Opti creates an opportunity for communication among project proponents for potential resource and cost sharing.

Opti is available at: http://irwm.rmcwater.com/rwa/login.php

Changes from 2013 ARB IRWMP:

- Updated Opti to collect information for Storm Water Resource Plan projects.
- Updated the Opti site.

Adaptation to Climate Change

Recent drought, floods, and wildfires have shown that climatic change will continue impact regional water supplies, water demands, water quality, and ecosystems. A climate change assessment was conducted for the Region as part of the 2013 ARB IRWMP Update and updated in 2018. The 2018 ARB IRWMP Update describes recent climate change effects, regional vulnerabilities to climate change, and climate change mitigation and adaptation actions. These regional vulnerabilities and actions will be refined as new tools are developed and new information is provided. Mitigation and adaptation actions will continue to be incorporated into IRWM projects and other water management efforts.

Changes from 2013 ARB IRWMP:

- Refined ARB climate change assessment.
- Updated description of climate change resiliency and adaptation measures.
- Incorporated information from regional and local climate change planning efforts.
- Added language describing how the IRWMP will be adaptively managed to address the impacts of climate change and other uncertainties.

ARB IRWMP Implementation

As the RWMG, RWA assumes responsibility for developing, adopting, maintaining and monitoring the ARB IRWMP. Individual stakeholders may voluntarily adopt the ARB IRWMP. Adoption is required if a stakeholder desires to participate in a regional effort to pursue IRWM-related funding for a proposed project. Adoption may also be required for stakeholders pursuing other funding opportunities on their own, but this is dependent on the specific criteria of each funding program.

The IRWMP Framework is designed to be adaptable into the future. Changes to the Framework vision, goals, objectives, and principles are not expected to occur frequently, and they would require RWMG approval. In contrast, strategies and projects are meant to be dynamic and changes would be proposed by and vetted with stakeholders. Modifications to strategies and projects do not require any formal action by the RWMG.

Changes from 2013 ARB IRWMP:

- Added language describing how the IRWMP will be adaptively managed to address the impacts of climate change and other uncertainties.
- Updated description of funding opportunities and regional successes securing plan and project financing.

Want to learn about and stay up to date on regional water management efforts?

Have projects to share?

Join the **ARB IRWM community**!

Log in at http://irwm.rmcwater.com/rwa/login.php

More information and the complete ARB IRWMP is also available at https://rwah2o.org/programs/integrated-regional-water-management/american-river-basin-irwmp-2018-update/

Stantec

Regional Water Authority
BUILDING ALLIANCES IN NORTHERN CALIFORNIA

REGIONAL WATER AUTHORITY
5620 BIRDCAGE STREET, SUITE 180
CITRUS HEIGHTS, CA 95610

AMERICAN RIVER BASIN

Integrated Regional Water Management Plan

2018 UPDATE

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Abbreviations and Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
µg/L	micrograms per liter
AB 1755	Open and Transparent Water Data Act
AB	Assembly Bill
ABCW	American Basin Council of Watershed
AC/CC	Auburn Ravine/Coon Creek
ADWF	average dry weather flow
Aerojet	Aerojet General Corporation
AF	acre-feet
AFB	air force base
AFY	acre-feet per year
ARB SWRP	American River Basin Stormwater Resource Plan
ARB	American River Basin
ARBS	American River Basin Study
ARFCD	American River Flood Control District
ASR	Aquifer Storage and Recovery
ATP	Antelope Transmission Pipeline
Auburn	City of Auburn
BMO	basin management objective
BMP	Best Management Practice
CABY	Cosumnes, American, Bear, Yuba
Cal-Am	California American Water
CALFED	CALFED Bay-Delta Program
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CASGEM	California Statewide Groundwater Elevation Monitoring
CDFW	California Department of Fish and Wildlife
CVRWQCB	Central Valley Regional Water Quality Control Board
cfs	cubic feet per second
CFW	Camp Far West
CHWD	Citrus Heights Water District
CNRA	California Natural Resources Agency
CRP	Cosumnes River Preserve
CrVI	hexavalent chromium

CSA	Central Service Area
CSSIP	Combined Sewer System Improvement Plan
CTP	Cooperative Transmission Pipeline
CUWCC	California Urban Water Conservation Council
CVFPP	Central Valley Flood Protection Plan
CVP	Central Valley Project
CVPPP	Central Valley Flood Protection Plan
CVRWQCB	Central Valle Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWC	California Water Code
CWD	Carmichael Water District
CWP	California Water Plan
DAC	disadvantaged community
DCIP	Disadvantaged Community Involvement Program
DDT	dichlorodiphenyltrichloroethane
Delta	Sacramento-San Joaquin River Delta
DMM	Demand Management Measure
DWR	California Department of Water Resources
E. coli	Escherichia coli
EBMUD	East Bay Municipal Utility District
EDU	equivalent dwelling unit
EGWD	Elk Grove Water District
EID	El Dorado Irrigation District
EJ	environmental justice
Elk Grove	City of Elk Grove
EPA	U.S. Environmental Protection Agency
ERP	ecosystem restoration plan
FCWCD	Flood Control and Water Conservation District
FEMA	Federal Emergency Management Agency
FloodSAFE	FloodSAFE California
FMS	Flow Management Standard
Folsom	City of Folsom
FOWD	Fair Oaks Water District
Framework	ARB IRWMP Framework
FRWP	Freeport Regional Water Project
FVWC	Fruitridge Vista Water Company
Galt	City of Galt
GBA	Groundwater Banking Authority
GET	groundwater extraction and treatment
GHG	greenhouse gas
gpm	gallons per minute
GSA	groundwater sustainability agency
GSP	groundwater sustainability plan
GSWC	Golden State Water Company
GWTP	groundwater treatment plant
Handbook	Climate Change Handbook for Regional Water Planning
HCD	California Department of Housing and Community Development
HCP	Habitat Conservation Plan
I-Bank	California Infrastructure and Economic Development Bank
IPCC	Intergovernmental Panel on Climate Change
IRWM	Integrated Regional Water Management

IRWMP	Integrated Regional Water Management Plan
LID	low impact development
Lincoln	City of Lincoln
M&I	municipal and industrial
MAC	Mokelumne/Amador/Calaveras
MCL	maximum contaminant level
MG	million gallons
mg/L	milligrams per liter
MGD	million gallons per day
MHI	median household income
MOU	Memorandum of Understanding
NAB RDCP	North American Basin Regional Drought Contingency Plan
NCMWC	Natomas Central Mutual Water Company
NDMA	n-nitrosodimethylamine
NID	Nevada Irrigation District
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSA	North Service Area
NSV	Northern Sacramento Valley
O&M	operation and maintenance
OHWD	Omochumne-Hartnell Water District
OVWC	Orange Vale Water Company
PCB	polychlorinated biphenyl
PCE	tetrachlorethene
PCWA	Placer County Water Agency
PDF	Portable Document Format
PG&E	Pacific Gas and Electric
Placer Legacy	Placer County/Placer Legacy Program
POU	Place of Use
PRC	Public Resources Code
Proposition 1	Water Quality, Supply, and Infrastructure Improvement Act of 2014
Proposition 84	The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006
Rancho Cordova	City of Rancho Cordova
RD	Reclamation District
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
Region	ARB Region
RFMP	Regional Flood Management Plan
RMS	resource management strategy
RLECWD	Rio Linda/Elverta Community Water District
RSAC	Rural Community Assistance Corporation
RWA	Regional Water Authority
RWMG	Regional Water Management Group
RWRP	Regional Water Reliability Plan
SacIWRM	Sacramento Area Integrated Water Resources Model
SACOG	Sacramento Area Council of Governments
Sacramento	City of Sacramento
SAFCA	Sacramento Area Flood Control Agency
SARSAS	Save Auburn Ravine Steelhead and Salmon
SASD	Sacramento Area Sewer District

SAWC	South Area Water Council
SB	Senate Bill
SCGA	Sacramento Central Groundwater Authority
SCWA	Sacramento County Water Agency
SD&FCC	storm drainage and flood control collection
SDAC	Severely Disadvantaged Communities
SDWSRF	Safe Drinking Water State Revolving Fund
SEA/EIR	Supplemental Environmental Assessment/Environmental Impact Report
SGA	Sacramento Groundwater Authority
SGMA	Sustainable Groundwater Management Act
SGMA	Sustainable Groundwater Management Act of 2014
SJWD	San Juan Water District
SMD	Sewer Maintenance District
SMUD	Sacramento Municipal Utility District
SNMP	Salt and Nutrient Management Plan
SPFC Planning Area	areas currently protected by facilities of the SPFC
SPFC	State Plan of Flood Control
SPMUD	South Placer Municipal Utilities District
SRA	Shaded Riverine Aquatic
SRCSD	Sacramento Regional County Sanitation District
SRWWTP	Sacramento Regional WWTP
SSA	South Service Area
SSCAWA	South Sacramento County Agricultural Water Authority
SSHCP	South Sacramento Habitat Conservation Plan
SSMP	Sewer System Management Plan
SSQP	Sacramento Stormwater Quality Partnership
SSWD	Sacramento Suburban Water District
State Water Board	State Water Resources Control Board
state	state of California
SWMP	stormwater management plan
SWRP	STORMWATER RESOURCE PLAN
TAF	thousand acre-feet
TDS	total dissolved solids
TMDL	total maximum daily load
TNC	The Nature Conservancy
UAIC	United Auburn Indian Community
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	ultraviolet
UWMP	urban water management plans
WD	Water District
WDCWA	Woodland-Davis Clean Water Agency
WDR	Waste Discharge Requirement
WEP	Water Use Efficiency Program
West Sacramento	City of West Sacramento
Westside-Sac	Westside-Sacramento
WET	Water Education Today
WFA	Water Forum Agreement
WIFIA	Water Infrastructure Finance and Innovation Act of 2014

WINN	Water Infrastructure Improvement for the Nation
WPC	Western Placer County Groundwater Management Plan Group
WRA	Water Resources Association
WRDA	Water Resources Development Act
WRF	Water Reclamation Facility
WRPP	Water Recycling Pilot Program
WSAFCA	West Sacramento Area Flood Control Agency
WTP	Water Treatment Plant
WWTP	wastewater treatment plant
WWTRF	Wastewater Treatment and Reclamation Facility

Section 1
Introduction

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Abbreviations and Acronyms

ARB	American River Basin
DWR	California Department of Water Resources
IRWMP	Integrated Regional Water Management Plan
NAB RDCP	North American Basin Regional Drought Contingency Plan
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RWA	Regional Water Authority
RWRP	Regional Water Reliability Plan
SWRP	Storm Water Resource Plan
WFA	Water Forum Agreement

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1. INTRODUCTION

The California Department of Water Resources (DWR) broadly defines integrated water management as "…a philosophy and practice of coordinating the management of water and related resources for the purpose of maximizing economic and societal benefits while maintaining the sustainability of vital ecosystems" (DWR 2012d). An Integrated Regional Water Management Plan (IRWMP), then, is the application of this concept within a region with a breadth and focus defined locally by stakeholders. The stakeholders identify major water and related resource management issues, develop goals and objectives for addressing these issues and, ultimately, implement projects that help meet these goals and objectives. The stakeholders would also monitor and evaluate the region's progress in meeting those goals and objectives set in their IRWMP. For over two decades, stakeholders dependent on the natural resources of the greater Sacramento region have been engaged in planning and implementing regional plans and projects to meet water supply demands and protect our environment. The 2018 American River Basin (ARB) IRWMP Update represents the latest iteration of our ongoing effort to achieve this balance between sustainable water resources and related ecosystems.

1.1. Background and Purpose

The greater Sacramento region has long recognized the need to better integrate water resources planning and development with consideration of protection of the natural environment. For decades, attempts to further develop water resources on the lower American River resulted in divisive litigation. In 1993, a diverse group of stakeholders recognized the need for regional solutions and began discussions to address long-term reliable water supplies for urban, agricultural, environmental, and recreational water needs. Following a nearly 7-year facilitated effort, the Water Forum Agreement (WFA) was signed in April 2000. The WFA serves as the foundation of regional integrated planning and has more than 40 signatories representing citizens groups, business interests, environmental groups, and public agencies. The WFA includes seven integrated management elements needed to meet the co-equal objectives of: (1) providing a reliable water supply for planned development to the year 2030, and (2) protecting and preserving the lower American River (from Folsom Dam to the confluence with the Sacramento River).

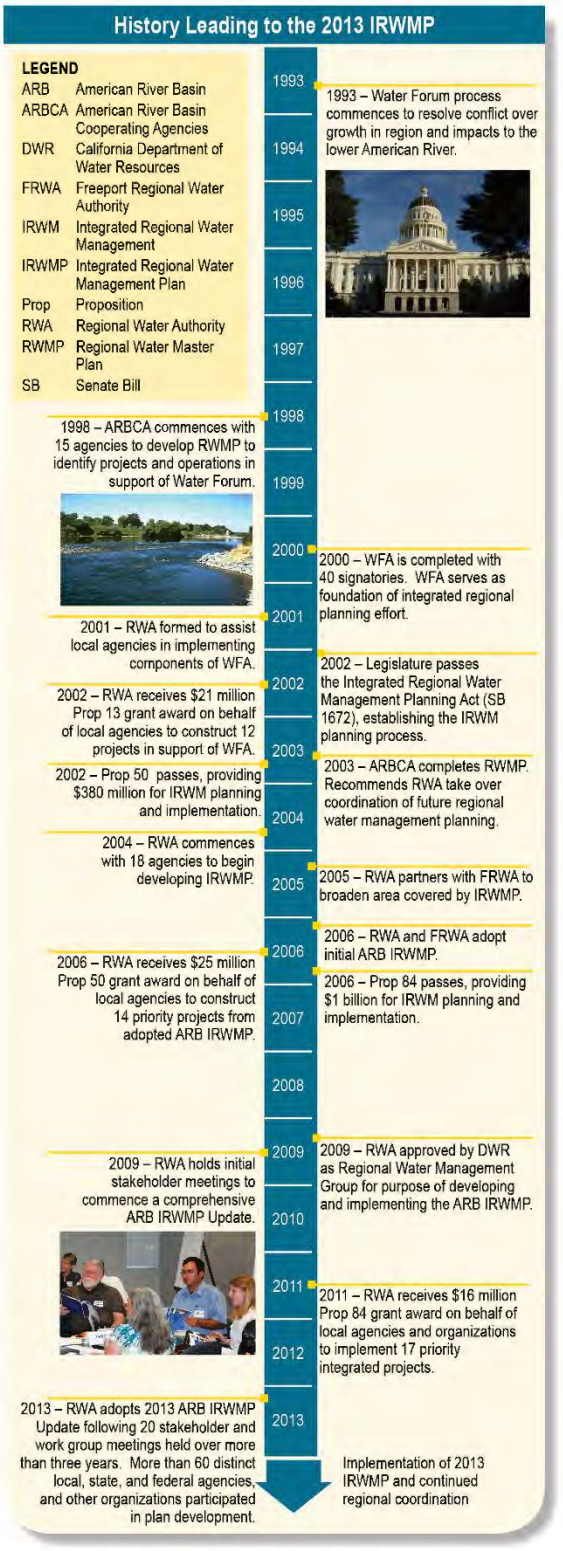

Figure 1-1. History Leading to the 2013 ARB IRWMP Update

In July 2001, water suppliers in the greater Sacramento region formed the Regional Water Authority (RWA) as a joint powers authority, in part, to help implement elements of the WFA on a regional basis. In April 2004, RWA began an effort to develop an IRWMP, which resulted in the May 2006 adoption of the first ARB IRWMP. The 2013 ARB IRWMP Update relied on extensive stakeholder input to comprehensively revise and update the previous goals and objectives and added many new stakeholder-derived considerations, such as vision and principles, to the plan. During development of the 2013 ARB IRWMP Update, the breadth of stakeholders was expanded well beyond the original WFA. **Figure 1-1** provides an overview of the events that led up to the development of the 2013 ARB IRWMP Update.

Since adoption of the 2013 ARB IRWMP Update, a number of events occurred that have underscored the need to increase the resiliency of the Region's water systems to the impacts of climate change and other uncertainties. These events are summarized in **Figure 1-2**.

2014
Drought State of Emergency declared.

- Sustainable Groundwater Management Act passes.
- Prop 1 Water Bond (AB 1471) passes, authorizing $7.55 billion in funds for supply and watershed protection projects, with $510 million dedicated for integrated regional water management planning.
- Senate Bill 985 passes, requiring agencies to develop stormwater resource plans to receive Prop 1 funds.
- RWA receives $9.8 million Prop 84 grant award on behalf of local agencies and organization to implement 17 projects

2015

- Water right curtailments throughout California.
- Mandatory 25% statewide reduction in water use are enacted.
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- Region receives $650,000 WaterSMART grant award to develop American River Basin Study as local follow-up to the Sacramento and San Joaquin Rivers Basin Study.

2017
Drought State of Emergency lifted.

- Sacramento River Funding Area receives $3.7 million Prop 1 grant award to ensure DAC involvement in IRWM planning efforts.
- RWA receives $250,000 Prop 1 planning grant award on behalf of local agencies and organizations to update 2013 ARB IRWMP.
- RWA holds initial stakeholder meetings to commence comprehensive ARB 2018 IRWMP Update.
- GSAs are formed.
- El Dorado County Water Agency receives $400,000 Reclamation WaterSMART grant award on behalf of local agencies and organization to develop ARB Water Marketing Strategy.
- North American Basin RDCP is completed.

2018

- Local flooding in parts of the Region. Sacramento Weir opened for first time in over a decade.
- Local groundwater management authorities receive $3 million in funding for development of groundwater sustainability plans for the North American, South American, and Cosumnes Subbasins.
- Prop 68 passes, authorizing $1.19 billion in funding for water infrastructure and flooding projects.
- Regional Water Reliability Plan completed by RWA.
- ARB SWRP and West Slope SWRP are finalized and adopted.
- 2018 ARB IRWMP Update is finalized and adopted following four stakeholder workshops over two years.

LEGEND

AB	Assembly Bill	Prop	Proposition
ARB	American River Basin	RDCP	Regional Drought Contingency Plan
DAC	disadvantaged community	Reclamation	U.S. Department of the Interior, Bureau of Reclamation
GSA	Groundwater Sustainability Agency	RWA	Regional Water Authority
GSP	Groundwater Sustainability Plan	SAFCA	Sacramento Area Flood Control Agency
IRWMP	Integrated Regional Water Management Plan	SWRP	Storm Water Resource Plan

Figure 1-2. Noteworthy Events from 2013 to 2018 ARB IRWMP Update

Governor Edmund G. Brown Jr. declared a Drought State of Emergency in January 2014. Over the next three years, California continued to experience record-low levels of precipitation and snowpack. Balancing urban, agricultural, industrial, and environmental water needs became increasingly challenging. Following unprecedented water conservation and winter storms, Governor Brown declared an end to the drought in April 2017. Remarkably, many parts of the Region experienced localized flooding in the winter of 2017. The drought and recent flooding illustrate the need to continue to assess the Region's vulnerabilities to hydrologic extremes and climate change and implement mitigation and adaptation measures across all water sectors.

In response, regional stakeholders accelerated a series of projects and planning efforts to (1) increase the Region's resiliency to drought and the impacts of climate change, and (2) develop opportunities to expand a regional conjunctive use program. These efforts built on over two decades of collaborative water resource management, as well as partnerships with several state and federal agencies, including DWR and the U.S. Department of the Interior, Bureau of Reclamation (Reclamation). Agencies in the Region completed the North American Basin Regional Drought Contingency Plan (NAB RDCP) in the fall of 2017. The NAB RDCP was a collaborative planning effort to explore opportunities to increase the resiliency of the Region's water resources in the face of future climate and drought conditions. The effort was partially supported by a grant from Reclamation's WaterSMART Drought Response Program. More recently, agencies have collaborated on a Regional Water Reliability Plan (RWRP) to increase the reliability of water supply for public needs. Funded by the agencies, the RWRP builds upon the NAB RDCP, but further expands the scope of identified constraints and opportunities to expand a regional conjunctive use program. The NAB RDCP and RWRP, in conjunction with local climate action and sustainability plans, provide the foundation for achieving long-term water resource reliability in the Region going forward.

The 2018 ARB IRWMP Update incorporates lessons learned during the drought and recent flooding and builds upon regional adaptation planning efforts and local climate action and sustainability plans. It also reflects significant changes in water management policy, regulation, and funding opportunities that have occurred in the last five years. For example, the Sustainable Groundwater Management Act, passed in 2014, enacted landmark reforms that could significantly alter how the Region's groundwater resources are managed. In that same year, Senate Bill 985 required agencies to develop new storm water resource plans (SWRP) to receive Proposition 1 funds for storm water projects. The ARB SWRP and West Slope SWRP were finalized in July 2018 and are incorporated into this IRWMP.

The 2018 ARB IRWMP Update was developed with significant stakeholder input. Public and stakeholder feedback was provided in four Planning Forums and multiple comment processes held over a year. This comprehensive update to the 2013 ARB IRWMP includes the following new information:

1. Updated –
    - ARB Region boundaries.
    - All basic water-related, environmental, and socioeconomic data.
    - Water quality conditions.
    - Goals, principles, objectives, and strategies for meeting water resource management needs.
    - Regional climate change vulnerabilities and adaptation measures.
    - Plan performance and monitoring to include policies and procedures for adaptive management.
    - IRWMP and project financing and implementation.
    - Projects list.
2. Coordinating with and incorporating other local and regional planning efforts, such as groundwater sustainability plans, SWRPs, and local climate action and sustainability plans.

1.2. Document Organization

The 2018 ARB IRWMP Update is organized into the following sections:

- **Section 1 – Introduction**. This section introduces the 2018 ARB IRWMP Update and details how it meets the DWR 2016 IRWMP Guidelines.
- **Section 2 – Region Description**. This section describes the Region's institutional, water resources, and environmental setting. It also describes the Region's vulnerabilities to impacts of climate change as well as the adaptation and mitigation actions to those impacts. This section concludes with a description of the technical analysis used in developing this IRWMP.
- **Section 3 – Planning Coordination and Integration**. This section describes the process by which RWA coordinates and interacts with its stakeholders, the public, and disadvantaged communities.

This section also includes the IRWMP's relation to local water and land-use planning, neighboring planning efforts, and state of California and federal agencies.

- **Section 4 – IRWMP Governance**. This section provides an overview of the Planning Forum, Advisory Committee, and RWA as the Regional Water Management Group. These elements of the governance structure evolved throughout the planning process. This section also explains the process of IRWMP adoption.

- **Section 5 – IRWMP Framework**. This section describes how the 2018 ARB IRWMP Update was developed. It details the vision, goals, principles, objectives, and strategies that guide implementation. It also describes how implementation projects were identified and prioritized, and how identified strategies will help the Region adapt to the impacts of climate change.

- **Section 6 – IRWMP Implementation**. This section describes how the 2018 ARB IRWMP Update will be implemented, including options for financing, performance monitoring, and data management. It describes the potential impacts and benefits of implementation, and how the 2018 ARB IRWMP Update will be adopted and adapted to future situations.

- **Section 7 – References**. This section lists the references used and cited throughout the IRWMP document.

1.3. IRWMP Standards

Table 1-1 lists the required components of an IRWMP (per DWR's 2016 Guidelines) and indicates the section(s) of the 2018 ARB IRWMP Update in which each component is addressed.

Table 1-1. Location of 2018 ARB IRWMP Update Components

	Description	Location in 2018 ARB IRWMP Update
A.	Governance	
1.	Description of RWMG responsible for development and implementation of the plan.	**Section 4.2.4**
2.	Description of the RWMG and individual project proponents who adopted the plan.	**Section 4.3**
3.	Description of IRWM governance structure.	**Section 4.2**
4	Description of how chosen governance addresses and ensures the following:	
4a.	Public outreach and involvement processes.	**Sections 3.1, 4.2**
4b.	Effective decision making.	**Section 4.2**
4c.	Balanced access and opportunity for participation in the IRWM process.	**Sections 3.1, 4.2**

Table 1-1. Location of 2018 ARB IRWMP Update Components (contd.)

	Description	Location in 2018 ARB IRWMP Update
4d.	Effective communication both internal and external to the IRWM region.	**Sections 3, 4**
4e.	Long-term implementation of the 2018 ARB IRWMP Update.	**Sections 4.2.3, 6.6**
4f.	Coordination with neighboring RWMG efforts and state and federal agencies.	**Sections 3.4, 3.5**
4g.	Collaborative process used to establish 2018 ARB IRWMP Update objectives.	**Sections 3.1, 5**
4h.	How interim changes and formal changes to the 2018 ARB IRWMP Update will be performed.	**Sections 5.6, 6.6**
4i.	Process for updating or amending the 2018 ARB IRWMP Update.	**Sections 5.6, 6.6**
B.	Region Description	
1.	Description of watersheds/water system.	**Sections 2.6, 2.8**
2.	Description of internal boundaries within the region.	**Section 2.2**
3.	Water supply and demand projections for a minimum 20-year planning horizon.	**Section 2.9**
4.	Current and future water quality conditions.	**Section 2.6**
5.	Description of the social and cultural makeup of the regional community and the identification of important cultural or social values.	**Section 2.5.7**
6.	Description of economic conditions and important trends within the region.	**Section 2.5**
7.	Description of major water-related objectives and conflicts.	**Sections 2.10, 5**
8.	Explanation of how the IRWM regional boundary was determined.	**Section 2.1**
9.	Identification of neighboring or overlapping IRWM regions.	**Section 2.4**
10.	Explanation of how plan will help reduce dependence on the Sacramento-San Joaquin Delta for water supply.	**Section 2.3**
11.	Description of likely climate change impacts on the region.	**Sections 2.10, Appendix C**
C.	Objectives	
1.	Description of measureable regional planning objectives that address climate change adaptation and mitigation.	**Sections 5.5, 5.6**
2.	Description of objective development process.	**Sections 3.1, 5**
3.	Objective prioritization process.	**Section 5.5**
D.	Resource Management Strategies	
1.	Description of RMS consideration process.	**Section 5.6.7**
2.	Description of how the effects of climate change on the region are factored into the RMS.	**Section 5.6.8**
3.	Description of how RMS reduce energy consumption.	**Section 5.6**
4.	Evaluation of RMS and other adaptation strategies and ability of such strategies to eliminate or minimize those vulnerabilities.	**Section 2.10.2, 5.6.8**
5.	Range of RMS considered to meet the IRWM objectives.	**Section 5.6**
6.	Description of RMSs incorporated into 2018 ARB IRWMP Update.	**Section 5.6**

Table 1-1. Location of 2018 ARB IRWMP Update Components (contd.)

	Description	Location in 2018 ARB IRWMP Update
E.	Integration	
1.	Description of stakeholder/institutional integration.	**Section 3**
2.	Description of resource integration.	**Sections 3.1, 5, 6.4**
3.	Project Implementation integration.	**Sections 3.1, 5.7, 6.5**
F.	Project Review Process	
1.	Procedures for submitting a project to the RWMG.	**Section 5.7**
2.	Procedures for review of projects considered for inclusion into the 2018 ARB IRWMP Update, including consideration of climate change mitigation and adaptation.	**Section 5.7**
3.	Description of project review factors.	**Section 5.7**
4.	Procedures for displaying the list of selected projects.	**Section 5.7**
G.	Impacts and Benefits	
1.	Discussion of potential impacts and benefits within the region from 2018 ARB IRWMP Update implementation.	**Section 6.5**
2.	Discussion of benefits and impacts between regions.	**Section 6.5**
3.	Impacts and benefits directly affecting disadvantaged communities.	**Section 6.5.4**
4.	Impacts and benefits directly affecting environmental justice concerns.	**Section 6.5.4**
5.	Impacts and benefits directly affecting Native American tribal communities.	**Section 6.5.4**
H.	Plan Performance and Monitoring	
1.	Group(s) responsible for IRWM implementation evaluation.	**Section 6.3**
2.	Frequency of evaluating project implementation performance.	**Section 6.3**
3.	Tracking via data management systems.	**Sections 6.3, 6.4**
4.	Description of process for using "lessons learned."	**Sections 6.3, 6.6**
5.	Responsibility for development of project-specific monitoring plans and activities.	**Section 6.3**
6.	Stage of project development that a project-specific monitoring plan will be prepared.	**Section 6.3**
7.	Typically required contents of a project-specific monitoring plan.	**Section 6.3**
8.	Description of policies and procedures that promote adaptive management, and process for adapting the IRWMP and projects as conditions change, new tools are developed, and new information becomes available.	**Section 6.6**
I.	Data Management	
1.	Overview of data needs.	**Section 6.4.1**
2.	Description of typical data collection techniques.	**Section 6.4.2**
3.	Description of stakeholder data contributions to regional data management systems.	**Section 6.4.2**
4.	Entity responsible for maintaining data in the Region's data management systems.	**Section 6.4.2**
5.	Description of the validation or QA/QC measures.	**Section 6.4.2**

Table 1-1. Location of 2018 ARB IRWMP Update Components (contd.)

	Description	Location in 2018 ARB IRWMP Update
6.	Explanation of how data collected for project implementation will be transferred or shared between members of the RWMG and other interested parties.	**Sections 6.4.2, 6.4.4**
7.	Explanation of how the data management system supports the RWMG's efforts to share collected data.	**Section 6.4.2**
8.	An outline of how the data saved in the data management system will be distributed and remain compatible with state databases.	**Sections 6.4.2, 6.4.4**
J.	Finance	
1.	List of known, as well as, possible funding sources, programs, and grant opportunities for the development and ongoing funding of the IRWMP.	**Sections 6.1. 6.2**
2.	List of funding mechanisms for projects that implement the IRWMP.	**Section 6.2**
3.	Explanation of the certainty and longevity of known or potential funding for the IRWMP and projects.	**Section 6.2**
4.	Explanation of how O&M costs for projects that implement the IRWMP would be covered and the certainty of O&M funding.	**Section 6.2**
K.	Technical Analysis	
1.	Description of the technical information sources and data sets used to develop the water management needs in the IRWMP.	**Section 2.11**
2.	Description of studies, models, or other technical methodologies used to analyze the technical information and data sets.	**Section 2.11**
L.	Relation to Local Water Planning	
1.	List of local water plans used in the 2018 ARB IRWMP Update.	**Sections 2.10, 3.3, 3.2, 7, Appendix C, Appendix F**
2.	Discussion of how the 2018 ARB IRWMP Update relates to planning documents and programs established by local agencies.	**Section 3.2**
3.	Description of the dynamics between the IRWMP and local planning documents.	**Section 3.2**
4.	Description of the consideration and incorporation of water management issues and climate change and adaptation and mitigation strategies from local plans into the IRWMP.	**Sections 2.10, 3.2, 3.3, 5.6.8, Appendix C**
M.	Relation to Local Land-Use Planning	
1.	Description of current relationship between local land-use planning, regional water issues, and water management objectives.	**Section 3.3**
2.	Description of future efforts to establish a proactive relationship between land use planning and water management.	**Sections 3.3, 5.5**
3.	Description of the information sharing and collaboration with regional land use planning to manage multiple water demands.	**Sections 3.3, Appendix C**
N.	Stakeholder Involvement	
1.	Description of the public process that provides outreach and an opportunity to participate in IRWMP development and implementation to the appropriate local agencies and stakeholders.	**Sections 3.1, 4.2**

Table 1-1. Location of 2018 ARB IRWMP Update Components (contd.)

	Description	Location in 2018 ARB IRWMP Update
2.	The process used to identify, inform, invite, and involve stakeholder groups in the IRWM process during development and implementation of the 2018 ARB IRWMP Update.	**Sections 3.1, 4.2**
3.	A discussion on how the RWMG will identify and involve DACs and Native American tribal communities in the IRWM planning effort.	**Sections 3.1.4, 3.1.5, Appendix E**
4.	Description of the decision making process, including IRWM committees, roles, or positions that stakeholders can occupy and how a stakeholder goes about participating in those committees, roles or positions, regardless of their ability to contribute financially to the IRWMP.	**Sections 3.1, 4.2**
5.	Discussion regarding how stakeholders are necessary to address the objectives and resource management strategies of the IRWMP.	**Sections 4.2, 5.5, 5.6**
6.	Discussion of how collaborative processes will engage a balance of interest groups in the IRWM process regardless of their ability to contribute financially to the IRWMP's development or implementation.	**Section 3.1**
O.	Coordination	
1.	Process for coordination of projects and activities with local participants and stakeholders.	**Sections 3.1, 5.7**
2.	Identification of neighboring IRWM efforts and description of coordination between efforts.	**Section 3.4**
3.	Discussion of any ongoing water management conflicts with adjacent IRWM efforts.	**Section 3.4**
4.	Discussion of state, federal, and local agencies important to the development of the IRWMP and implementation of projects.	**Sections 3.1, 3.5**
P.	Climate Change	
1.	Discussion of the IRWM region's vulnerabilities to the effects of climate change.	**Sections 2.10, Appendix C, Appendix D**
2.	Discussion of potential adaptation responses.	**Sections 2.10, 5.6.8, Appendix C**
3.	Process that considers GHG emissions when choosing between project alternatives.	**Section 5.7.2**
4.	List of prioritized vulnerabilities based on the vulnerability assessment and the IRWM's decision making process.	**Sections 2.10.1, Appendix C, Appendix D**
5.	Description of how the IRWMP considers changes to the amount, intensity, timing, quality and variability and runoff and recharge and effects of sea level rise on water supply.	**Sections 2.10, 5**
6.	Description of plan for further data gathering and analysis.	**Sections 2.10, 2.11**

Key:
ARB = American River Basin
DAC = disadvantaged community
GHG = greenhouse gas
IRWM = Integrated Regional Water Management
IRWMP = Integrated Regional Water Management Plan
NA = not applicable
O&M = operation and maintenance
QA/QC = quality assurance/quality control
RMS = resource management strategy
RWMG = Regional Water Management Group
state = state of California

Section 2
Region Description

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Abbreviations and Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
µg/L	micrograms per liter
AB	Assembly Bill
ABCW	American Basin Council of Watershed
AC/CC	Auburn Ravine/Coon Creek
ADWF	average dry weather flow
Aerojet	Aerojet General Corporation
AF	acre-feet
AFB	air force base
AFY	acre-feet per year
ARB	American River Basin
ARBS	American River Basin Study
ARFCD	American River Flood Control District
ASR	Aquifer Storage and Recovery
ATP	Antelope Transmission Pipeline
Auburn	City of Auburn
BMO	basin management objective
BMP	Best Management Practice
CABY	Cosumnes/American/Bear/Yuba
Cal-Am	California American Water
CALFED	CALFED Bay-Delta Program
CASGEM	California Statewide Groundwater Elevation Monitoring
CDFW	California Department of Fish and Wildlife
cfs	cubic feet per second
CFW	Camp Far West
CHWD	Citrus Heights Water District
CRP	Cosumnes River Preserve
CrVI	hexavalent chromium
CSA	Central Service Area
CTP	Cooperative Transmission Pipeline
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVPPP	Central Valley Flood Protection Plan
CVRWQCB	Central Valley Regional Water Quality Control Board
CWC	California Water Code
CWD	Carmichael Water District
DAC	disadvantaged community
DDT	dichlorodiphenyltrichloroethane
Delta	Sacramento-San Joaquin River Delta
DMM	Demand Management Measure
DWR	California Department of Water Resources
E. coli	Escherichia coli
EBMUD	East Bay Municipal Utility District
EGWD	Elk Grove Water District
EID	El Dorado Irrigation District
Elk Grove	City of Elk Grove
EPA	U.S. Environmental Protection Agency

ERP	ecosystem restoration plan
FCWCD	Flood Control and Water Conservation District
FEMA	Federal Emergency Management Agency
FloodSAFE	FloodSAFE California
FMS	Flow Management Standard
Folsom	City of Folsom
FOWD	Fair Oaks Water District
FRWP	Freeport Regional Water Project
FVWC	Fruitridge Vista Water Company
Galt	City of Galt
GET	groundwater extraction and treatment
GHG	greenhouse gas
gpm	gallons per minute
GSA	groundwater sustainability agency
GSP	groundwater sustainability plan
GSWC	Golden State Water Company
GWTP	groundwater treatment plant
Handbook	Climate Change Handbook for Regional Water Planning
HCP	Habitat Conservation Plan
IPCC	Intergovernmental Panel on Climate Change
IRWM	integrated regional water management
IRWMP	Integrated Regional Water Management Plan
LID	low impact development
Lincoln	City of Lincoln
M&I	municipal and industrial
MAF	million acre feet
MCL	maximum contaminant level
MG	million gallons
MGD	million gallons per day
mg/L	milligrams per liter
MHI	median household income
MOU	Memorandum of Understanding
NAB RDCP	North American Basin Regional Drought Contingency Plan
NCMWC	Natomas Central Mutual Water Company
NDMA	n-nitrosodimethylamine
NID	Nevada Irrigation District
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSA	North Service Area
OHWD	Omochumne-Hartnell Water District
OVWC	Orange Vale Water Company
PCB	polychlorinated biphenyl
PCE	tetrachlorethene
PCWA	Placer County Water Agency
PCWA Act	Placer County Water Agency Act
PG&E	Pacific Gas and Electric
Placer Legacy	Placer County/Placer Legacy Program
POU	Place of Use
Rancho Cordova	City of Rancho Cordova
RD	Reclamation District

Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RFMP	Regional Flood Management Plan
RLECWD	Rio Linda/Elverta Community Water District
Roseville	City of Roseville
RWRP	Regional Water Reliability Plan
SacIWRM	Sacramento Area Integrated Water Resources Model
SACOG	Sacramento Area Council of Governments
Sacramento	City of Sacramento
SAFCA	Sacramento Area Flood Control Agency
SAFCA Act	Sacramento Area Flood Control Agency Act of 1990
SARSAS	Save Auburn Ravine Steelhead and Salmon
SASD	Sacramento Area Sewer District
SB	Senate Bill
SCGA	Sacramento Central Groundwater Authority
SCWA	Sacramento County Water Agency
SD&FCC	storm drainage and flood control collection
SDAC	Severely Disadvantaged Communities
SGA	Sacramento Groundwater Authority
SGMA	Sustainable Groundwater Management Act
SJWD	San Juan Water District
SMD	Sewer Maintenance District
SMUD	Sacramento Municipal Utility District
SPA	Sacramento Power Authority
SPFC	State Plan of Flood Control
SPMUD	South Placer Municipal Utilities District
SRA	Shaded Riverine Aquatic
SRCSD	Sacramento Regional County Sanitation District
SRWWTP	Sacramento Regional Wastewater Treatment Plant
SSA	South Service Area
SSMP	Sewer System Management Plan
SSQP	Sacramento Stormwater Quality Partnership
SSWD	Sacramento Suburban Water District
state	state of California
State Water Board	State Water Resources Control Board
SWMP	Stormwater Management Plan
SWRP	Storm Water Resources Plan
TAF	thousand acre-feet
TDS	total dissolved solids
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	ultraviolet
UWMP	urban water management plan
WD	Water District
WEP	Water Use Efficiency Program
WFA	Water Forum Agreement
WPC	Western Placer County Groundwater Management Plan Group
WRF	Water Reclamation Facility

WROS	Water Recycling Opportunities Study
WRPP	Water Recycling Pilot Program
WTP	Water Treatment Plant
WWRP	Wastewater Reclamation Plant
WWTP	wastewater treatment plant
WWTRF	Wastewater Treatment and Reclamation Facility

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2. REGION DESCRIPTION

This section describes the area encompassed by the American River Basin (ARB) Region, internal boundaries, and adjacent areas. Subsequently, the Region's economic trends and conditions are characterized with the discussion of trends in land use, demographics, and social and cultural makeup. An explanation of the water and environmental resources setting follows, which includes general information on climate; hydrology, water quality, habitat, and management of watersheds; and hydrogeology, water quality, and management characteristics of groundwater subbasins. This discussion is followed by stormwater and flood management systems; the discussion provides both a region-wide and local perspective on stormwater and floodwater management. The explanation of the water and wastewater systems lists the major water-related infrastructure, including water treatment and wastewater treatment plants of the Region. The following subsection on water demands and supplies first explores historic and projected demands as well as current demand management measures. The water supply description characterizes the Region's surface water, groundwater, and recycled water supplies, and explains water agencies' water supply portfolios and their projected future demands. The section ends with a discussion of the Region's vulnerabilities and adaptations to climate change.

The Region description section includes updated information from numerous local planning documents developed by government and local agencies within the Region, in addition to available descriptive data, such as population and hydrologic data. Examples of these documents include, for example, urban water management plans (UWMP), water master plans, and general plans. An explanation of technical analyses conducted in support of this section can be found in **Section 2.11**, and a list of references can be found in **Section 7**.

2.1. Regional Boundary

The Region encompasses Sacramento County and the lower watershed portions of Placer and El Dorado counties. **Figure 2-1** shows the Region along with the Water Forum Agreement (WFA) planning boundary and neighboring integrated regional water management (IRWM) regions. The Region boundary builds on this WFA history and boundary. Further, by designating the more urbanized portions of the greater Sacramento area within one IRWM region, the Region maximizes opportunities to integrate water resources management within areas facing relatively common challenges. The boundaries of the Region were defined by working directly with the organizations with water management authority to identify the most appropriate planning area.

In Sacramento County, nearly the entire county is included in the Region. At the recommendation of Sacramento County, the southeastern most portion of the county (referred to commonly as the "tail") was excluded. This area was excluded because it lies exclusively within the Sacramento-San Joaquin River Delta (Delta). This area has unique management issues that are beyond the scope of the ARB Integrated Regional Water Management Plan (IRWMP).

Previously, the western boundary of the Region was limited to the service area covered by the Placer County Water Agency (PCWA). This left a small area in western Placer County that was not covered by an IRWMP. In 2018, the Region boundary was extended west up to the boundary between Placer and Sutter counties, incorporating the previously excluded western portion of Placer County. In eastern Placer County, PCWA recommended including its service area around the City of Auburn (Auburn), because of its proximity to Folsom Reservoir, the Sacramento Valley Groundwater Basin, and the Sacramento metropolitan area.

In El Dorado County, only the westernmost portion of the county is included. With the recommendation of El Dorado Irrigation District (EID), the area corresponding to the community of El Dorado Hills was included in the Region. This area was included because of its proximity to Folsom Reservoir, the Sacramento Valley Groundwater Basin, and the Sacramento metropolitan area.

2.2. Internal Boundaries

The Region includes numerous political subdivision boundaries, watershed boundaries, groundwater subbasin boundaries, groundwater sustainability agency boundaries, stormwater/floodwater management agency boundaries, water agency boundaries, and wastewater agency jurisdictional boundaries. Separate maps display each of these boundaries in the following subsections.

Table 2-1 below lists the various water management-related agencies in the Region. These agencies interact, cooperate, and occasionally have conflicting interests with one another, creating a complex water management landscape in the Region. **Table 2-1** presents organizations with at least one water management-related statutory authority and indicates the nature of that authority. Further information can be found in relevant subsections throughout **Section 2**. Most agencies and their general service areas can be located in at least one of the maps in **Figures 2-1** through **2-6**. Other nongovernmental water-related organizations exist in the Region, although they may not be listed here.

Table 2-1. Water-Related Agencies in the Region

Agency	Water-Related Activities			
	Water Supply/ Groundwater	Wastewater/ Recycled Water	Stormwater/ Flood Management	Land-Use Planning
American River Flood Control District			X	
California American Water*	X			
Carmichael Water District*	X			
Citrus Heights Water District*	X			
City of Auburn		X	X	X
City of Citrus Heights			X	X
City of Elk Grove			X	X
City of Folsom*	X	X	X	X
City of Galt	X	X	X	X
City of Lincoln*	X	X	X	X
City of Rancho Cordova			X	X
City of Rocklin			X	X
City of Roseville*	X	X	X	X
City of Sacramento*	X	X	X	X
Clay Water District	X			
Del Paso Manor Water District*	X			
El Dorado County	X		X	X
El Dorado Irrigation District*	X	X		
Elk Grove Water District*	X			
Fair Oaks Water District*	X			
Florin County Water District	X			
Freeport Regional Water Authority	X			
Fruitridge Vista Water Company*	X			
Galt Irrigation District	X			
Golden State Water Company*	X			
Natomas Central Mutual Water Company	X			
Omochumne-Hartnell Water District	X			
Orange Vale Water Company*	X			
Placer County*	X	X	X	X
Placer County Flood Control & Water Conservation District			X	
Placer County Resource Conservation District				X
Placer County Water Agency*	X			
Rancho Murieta Community Services District*	X	X	X	X
Reclamation District 1000			X	
Rio Linda/Elverta Community Water District*	X			
Sacramento Area Council of Governments				X
Sacramento Area Flood Control Agency			X	
Sacramento Area Sewer District		X		
Sacramento Central Groundwater Authority	X			

Table 2-1. Water-Related Agencies in the Region (contd.)

Agency	Water-Related Activities			
	Water Supply/ Groundwater	Wastewater / Recycled Water	Stormwater/ Flood Management	Land-Use Planning
Sacramento County			X	X
Sacramento County Water Agency*	X		X	
Sacramento Groundwater Authority	X			
Sacramento Regional County Sanitation District*		X		
Sacramento Suburban Water District*	X			
San Juan Water District*	X			
South Area Water Council	X			
South Placer Utility District		X		
South Sutter Water District	X			
Southeast Sacramento County Agricultural Water Authority	X			
Tokay Park Water District	X			
Town of Loomis			X	X

Note:
* Agency is a member or an associate member of the RWA.

2.2.1. Municipality and County Boundaries

Figure 2-1 shows county, city, and town boundaries in the Region. Counties and municipalities are often involved in providing water supply, wastewater, and stormwater management services for their citizens. In cases where these services are not provided by these entities, special service districts assume these roles. During development of the ARB IRWMP, representatives from each of the municipalities and special districts providing these services were engaged to ensure broad representation of water planning interests.

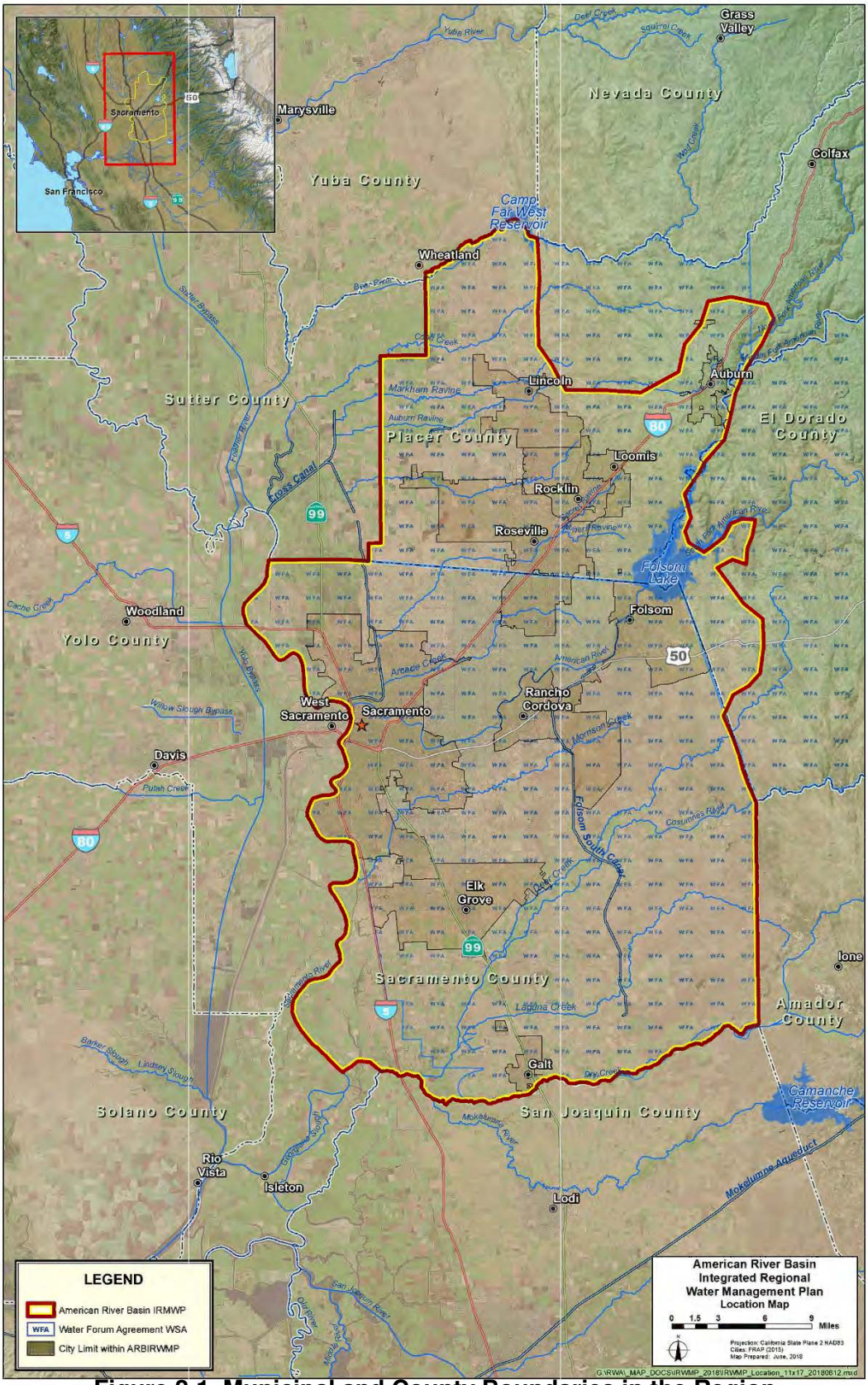


Figure 2-1. Municipal and County Boundaries in the Region

2.2.2. Watershed Boundaries and Surface Water Features

The Region lies in both the Sacramento and San Joaquin hydrologic regions and includes portions of six watersheds, as delineated by U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) datasets (see **Figure 2-2**). These watershed characteristics are described in **Section 2.6.2**. Key surface water bodies of the Region include Folsom Reservoir, the American River, the Sacramento River, and the Cosumnes River. These water bodies were integral in defining the Region, as they provide a substantial portion of the Region's water supply. These and other surface water bodies are shown in **Figure 2-2**. The portion of the Sacramento River that runs by the City of Sacramento (Sacramento) and Sacramento County acts as the western boundary of the Region. Also shown in **Figure 2-2** is the California Department of Water Resources (DWR) boundary between the Sacramento and San Joaquin hydrologic regions. The Region is part of both of these hydrologic regions, primarily because of past interaction with Sacramento County and the Water Forum.

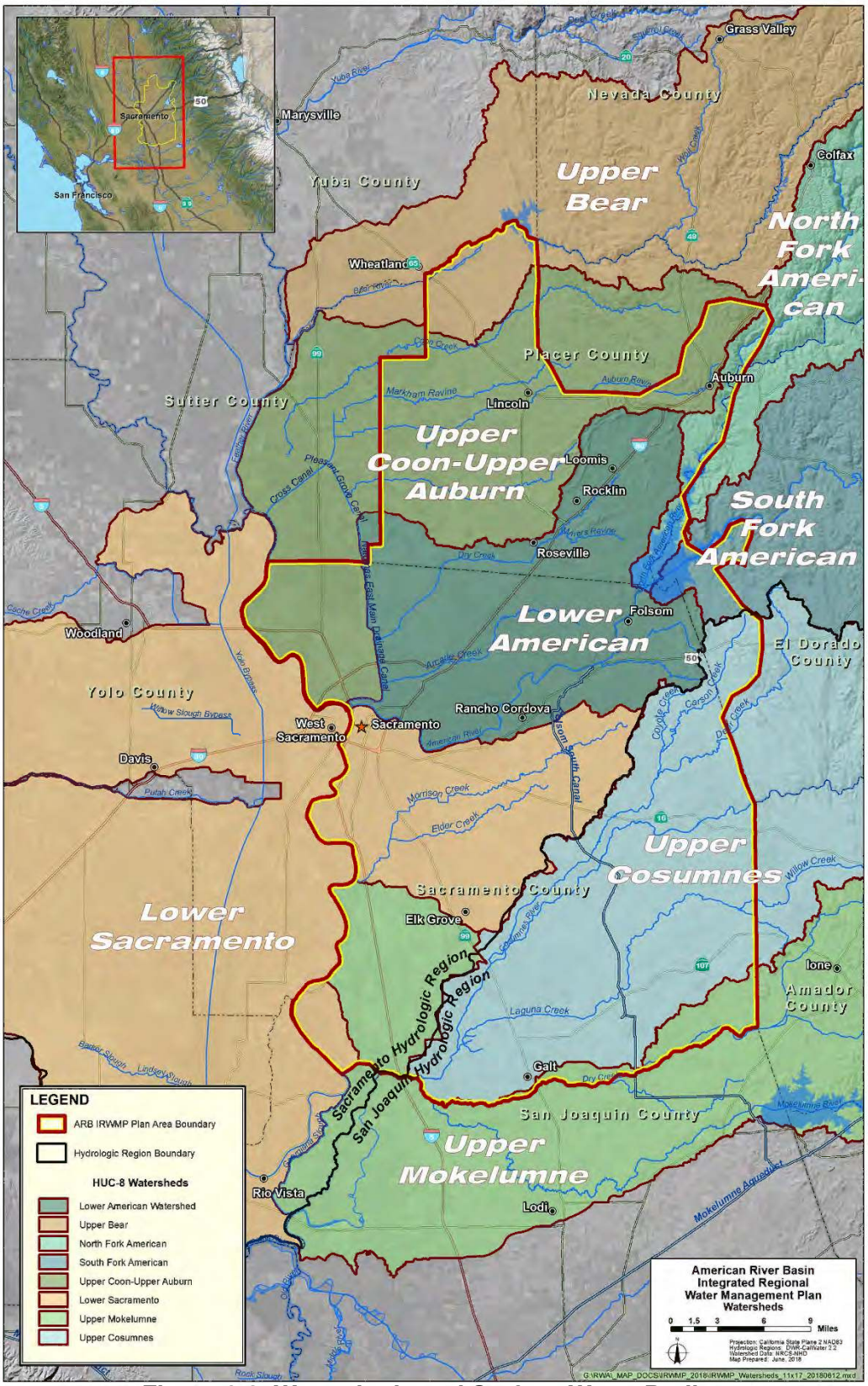


Figure 2-2. Watersheds and Surface Water Bodies

2.2.3. Groundwater Subbasin and Groundwater Sustainability Agency Boundaries

Most of the Region overlies the North American, South American, and the Cosumnes groundwater subbasins, as defined by DWR. The Sustainable Groundwater Management Act (SGMA) was adopted by California lawmakers in 2014. SGMA required, by June 30, 2017, the formation of locally-controlled groundwater sustainability agencies (GSA) in groundwater basins and subbasins (basins) designated as medium or high priority by DWR. The North American and South American subbasins are designated as high priority basins; the Cosumnes Subbasin is designated as medium priority. **Table 2-2** lists the twenty-six GSAs that have formed in the three subbasins.

Table 2-2. Groundwater Sustainability Agencies in the Region

Basin	Groundwater Sustainability Agencies
North American Subbasin	Sacramento Groundwater Authority West Placer Groundwater Sustainability Agency Sutter County** South Sutter Water District* Reclamation District 1001**
South American Subbasin	Sloughhouse Resource Conservation District #1 Sloughhouse Resource Conservation District #2 Sacramento Central Groundwater Authority #1 Sacramento Central Groundwater Authority #2 Sacramento Central Groundwater Authority #3 Omochumne-Hartnell Water District County of Sacramento Reclamation District No. 2110** Reclamation District No. 551 Reclamation District No. 755 Reclamation District No. 744 Reclamation District No. 813 Reclamation District No. 369** Franklin Drainage District
Cosumnes Subbasin	Galt Irrigation District Omochumne-Hartnell Water District Sloughhouse Resource Conservation District – Cosumnes Clay Water District Amador County Groundwater Management Authority** County of Sacramento City of Galt Groundwater Sustainability Agency

Notes:
*Partial overlap with ARB Region
**Outside of the ARB Region

Each basin must be covered by a GSA and contain a groundwater sustainability plan (GSP) or alternative to a GSP. These GSPs or alternative GSPs will assist groundwater basins in meeting sustainability goals. The primary goal is to maintain sustainable yields without causing undesirable results. Critically-overdrafted groundwater basins must be managed under a GSP by January 31, 2020. All other basins

designated as high- or medium-priority must be managed under a GSP by January 31, 2021. The North American Subbasin has created 5 GSAs. The South American and Cosumnes Subbasin are evaluating the possibility of having one GSP or multiple GSPs with multiple coordination agreements.

A portion of the North American Subbasin extends outside the Region. As described in **Section 2.1**, the Region's boundary was modified in 2018 to incorporate the western area of Placer County that overlies the North American Subbasin (see **Figure 2-3**). The portion of the North American Subbasin in Sutter County is still outside of the Region. The Region recognizes the importance of coordinating with the GSAs and land use agencies to ensure that the North American Subbasin is sustainably managed. Therefore, the remaining area of the North American Subbasin outside the Region boundary has been identified as an "IRWM Coordination Zone." GSAs throughout the North American Subbasin will work together to monitor groundwater levels, collect data, and assess the health of the Subbasin. Participating Agencies in the North American Subbasin will also consider the effect a project or program may have on the whole Subbasin and work with GSAs in the IRWM Coordination Zone to identify actions that contribute to the Subbasin's sustainability.

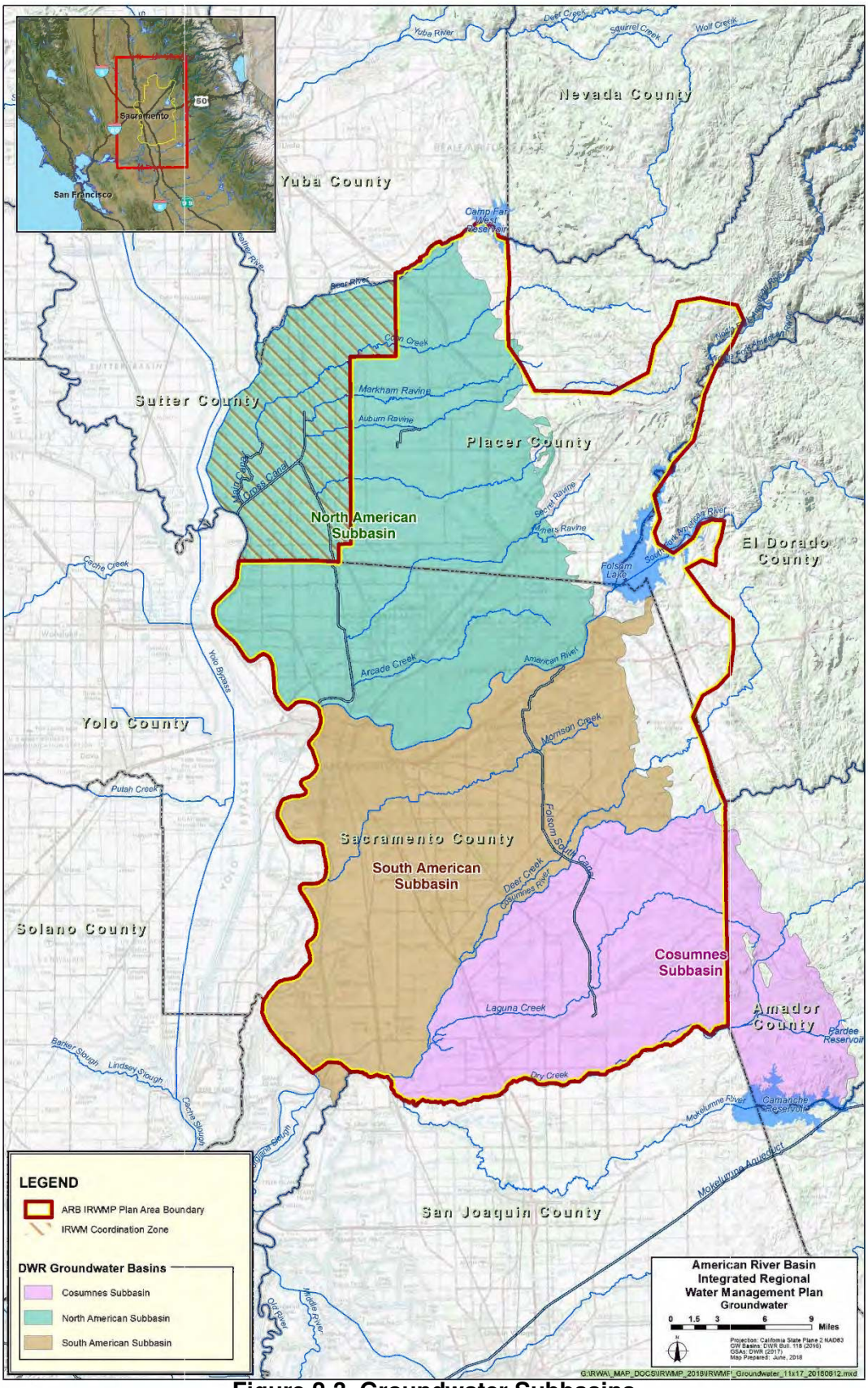


Figure 2-3. Groundwater Subbasins

2.2.4. Stormwater and Flood Management Agency Boundaries

Stormwater and flood management boundaries follow both city boundaries and flood-specific agency boundaries. Flood agencies in the Region include Reclamation District (RD) 1000, the American River Flood Control District (ARFCD), and the multiagency Sacramento Area Flood Control Agency (SAFCA). SAFCA boundaries include Sacramento and Sacramento counties, but also include agricultural areas outside of the Region boundaries such as the portion of Natomas Basin within Sutter County. Cities in the Region are responsible for their respective stormwater management systems. **Figure 2-4** shows stormwater and flood management agency jurisdictional boundaries as well as the Federal Emergency Management Agency (FEMA) 100-year floodplain.

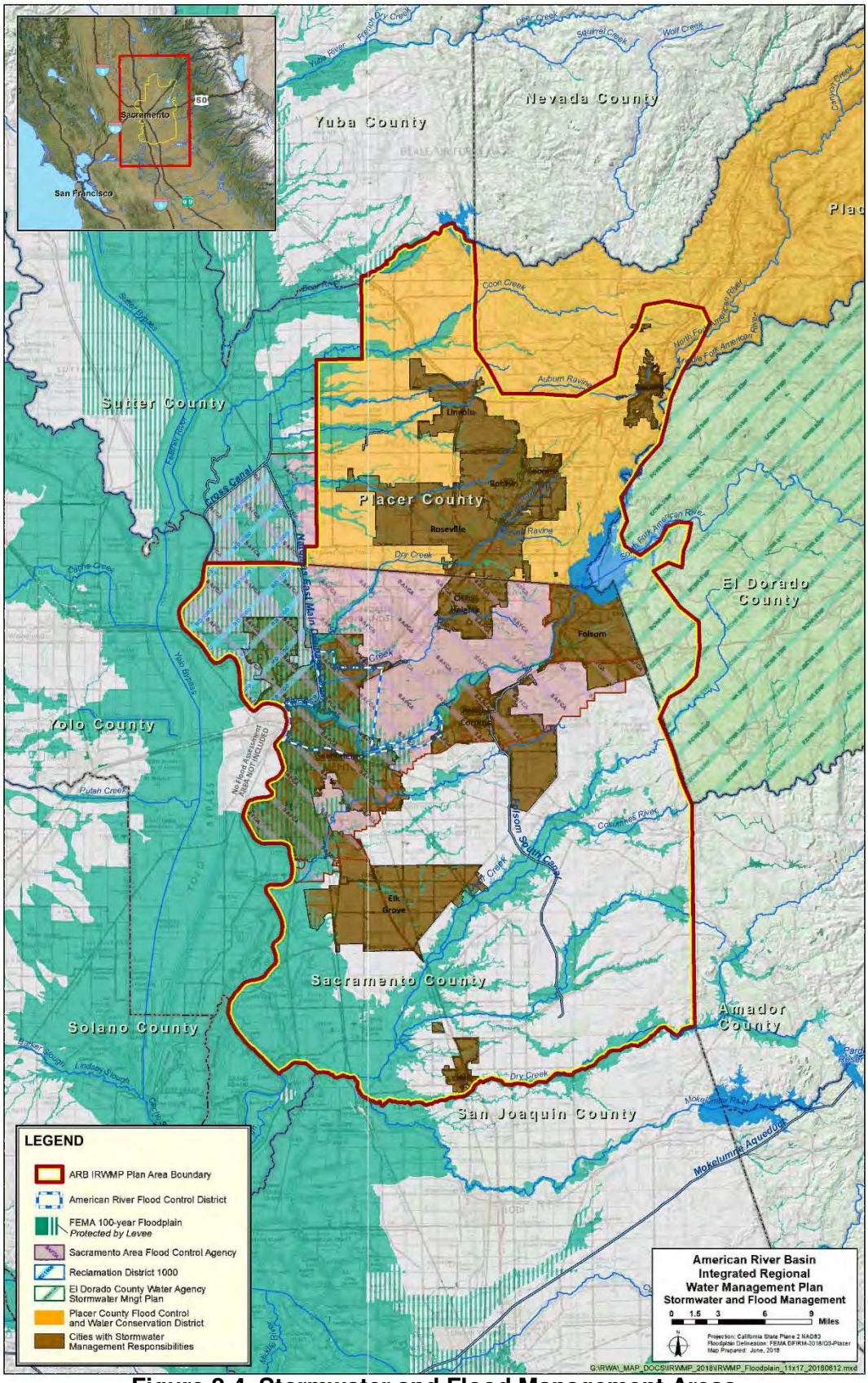


Figure 2-4. Stormwater and Flood Management Areas

2.2.5. Water Agency Boundaries

Each water agency in the Region is identified in **Figure 2-5**. As illustrated in **Figure 2-5**, there are 27 agencies with water delivery authority identified in the vicinities of Sacramento, western Placer, and El Dorado counties. One agency identified, South Sutter Water District (WD), has part of its service area included in the Region, including Camp Far West (CFW) Reservoir, owned and operated by South Sutter WD, on the northernmost Region border. Of the agencies shown on the map, 21 are primarily public water suppliers, five are primarily agricultural irrigation districts, two (PCWA and EID) supply both public supply and raw water supply for agriculture, and one (Sacramento Municipal Utility District [SMUD]) provides water for nonpotable uses at the former Rancho Seco Nuclear Generating Station. This nuclear station has been decommissioned and is now operated as a regional recreational park, including a 160-acre lake. It has also been observed that SMUD's upstream reservoirs impact flood management operations at Folsom Reservoir.

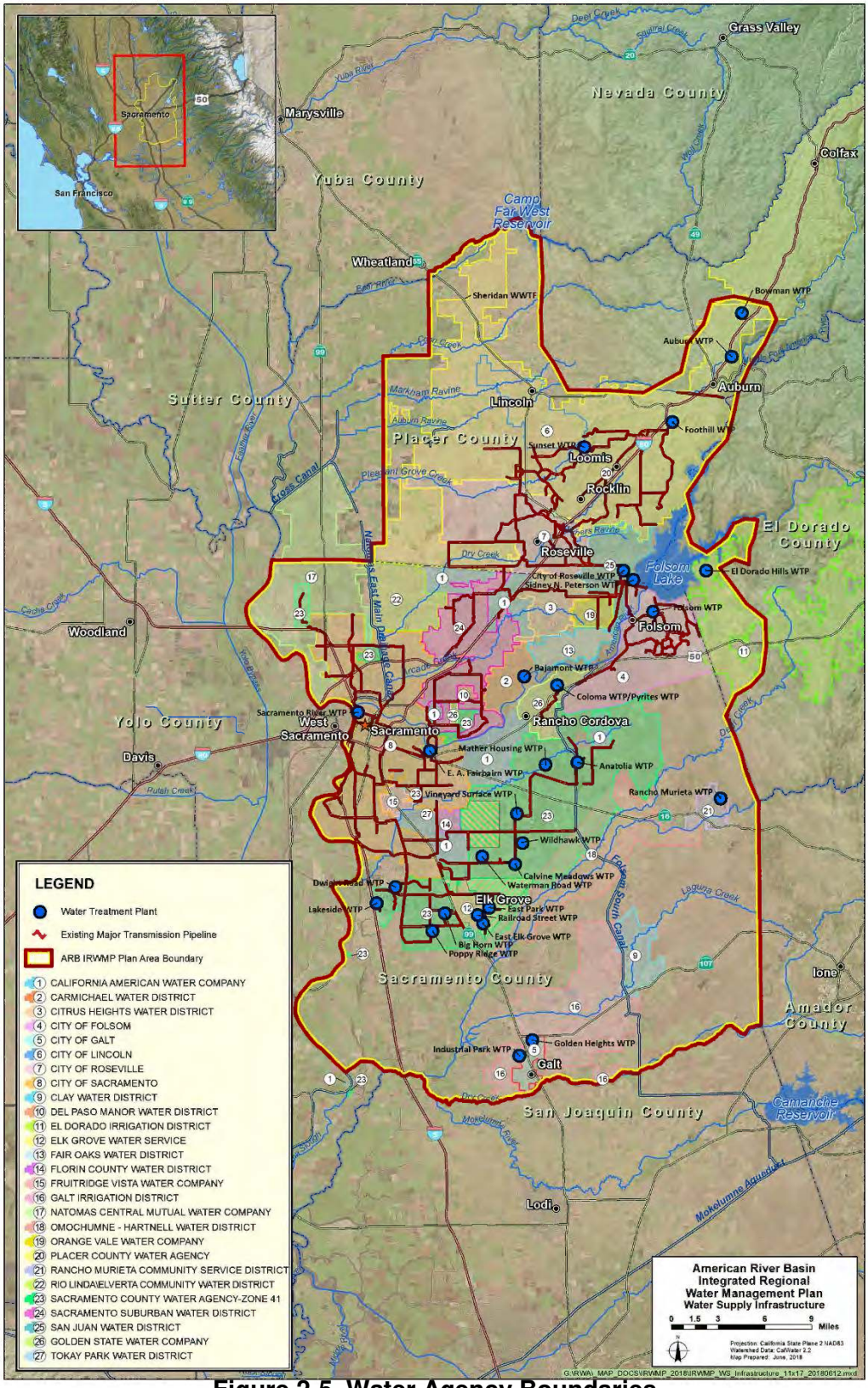


Figure 2-5. Water Agency Boundaries

2.2.6. Wastewater Agency Boundaries

Incorporated cities, the South Placer Utility District, and Placer County provide wastewater sewer systems as well as wastewater treatment plants (WWTP) in Placer County. Sacramento Regional County Sanitation District (SRCSD) collects and treats wastewater regionally, and from most of the urbanized areas in and immediately surrounding Sacramento County. El Dorado Hills in El Dorado County is served by EID and its WWTP. These boundaries are shown in **Figure 2-6**.

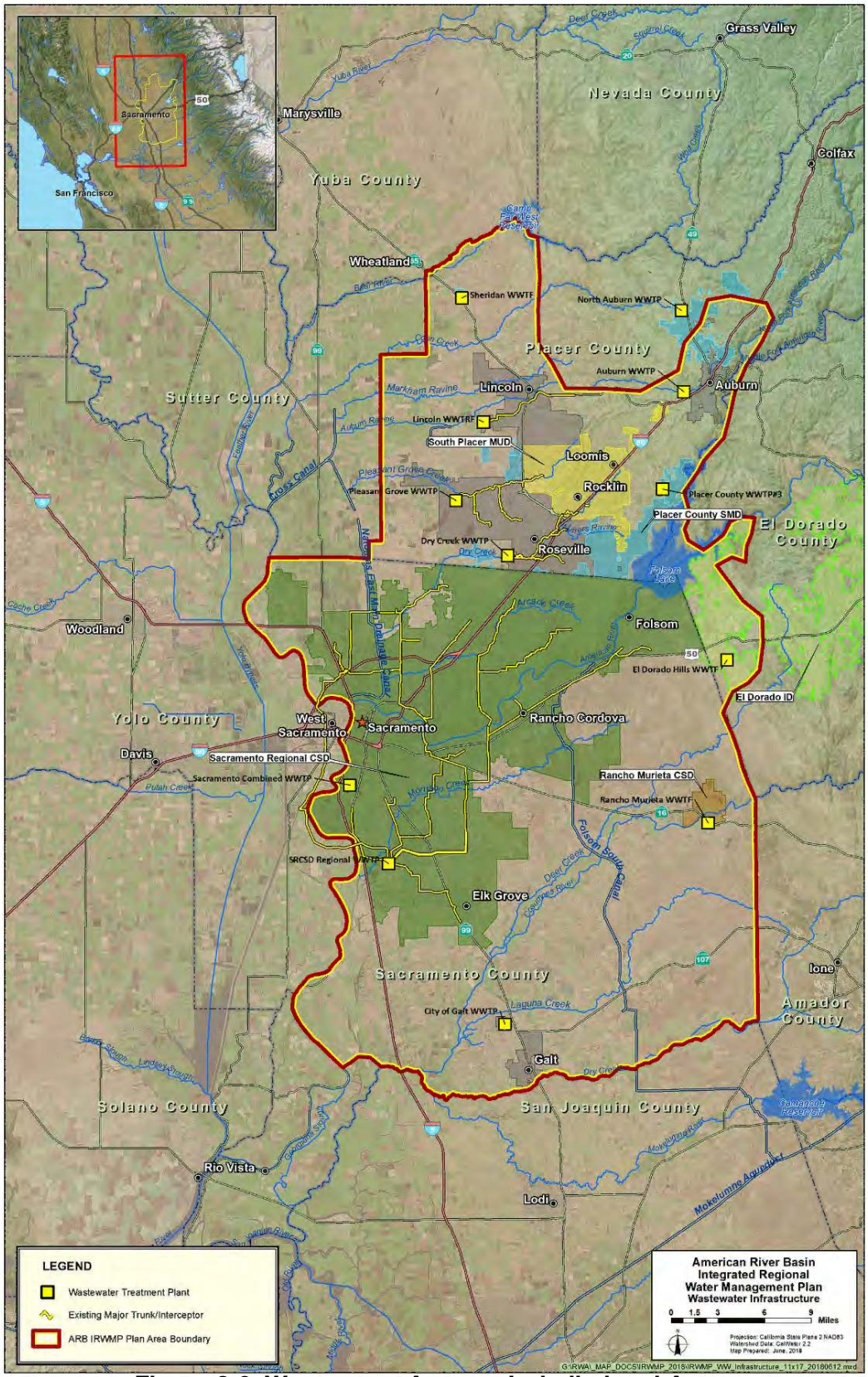


Figure 2-6. Wastewater Agency Jurisdictional Areas

2.3. Relationship to the Sacramento-San Joaquin Delta

The statutorily-defined Delta overlaps a small portion of the Region's southwestern corner, as shown in **Figure 2-7**. Of the ARB's 1,263 square-mile area, 69 square-miles are included in the legal Delta.

As the result of a legal settlement almost three decades ago regarding the potential impacts of diverting increased amounts of water from the American River at Nimbus Dam into the Folsom South Canal, an alternative diversion was constructed downstream of the confluence of the American and Sacramento rivers. That diversion, the Freeport Regional Water Project (FRWP), is located just south of the Pocket area of Sacramento, near the community of Freeport, and within the statutory Delta.

The FRWP is a joint facility owned by the Sacramento County Water Agency (SCWA) and the East Bay Municipal Utilities District (EBMUD). The project enables SCWA to implement a conjunctive use program to improve water supply reliability by serving surface water when it's available and groundwater when it's not, as well as providing a more secure drought year water supply for EBMUD.

The FRWP is protective of fish in the lower American River by allowing water to remain in the river to and beyond the confluence with the Sacramento River prior to being diverted. This project complements the other efforts of SCWA and other WFA signatories to develop a flow management standard for the lower American River and implement dry year actions, resulting in more water in the river than would otherwise be the case.

Furthermore, SCWA's conjunctive use program, in combination with active groundwater management, has increased use of recycled water, and its aggressive conservation program (defined in its Urban Water Management Plan) ensures responsible water management and reduced reliance on the Delta.

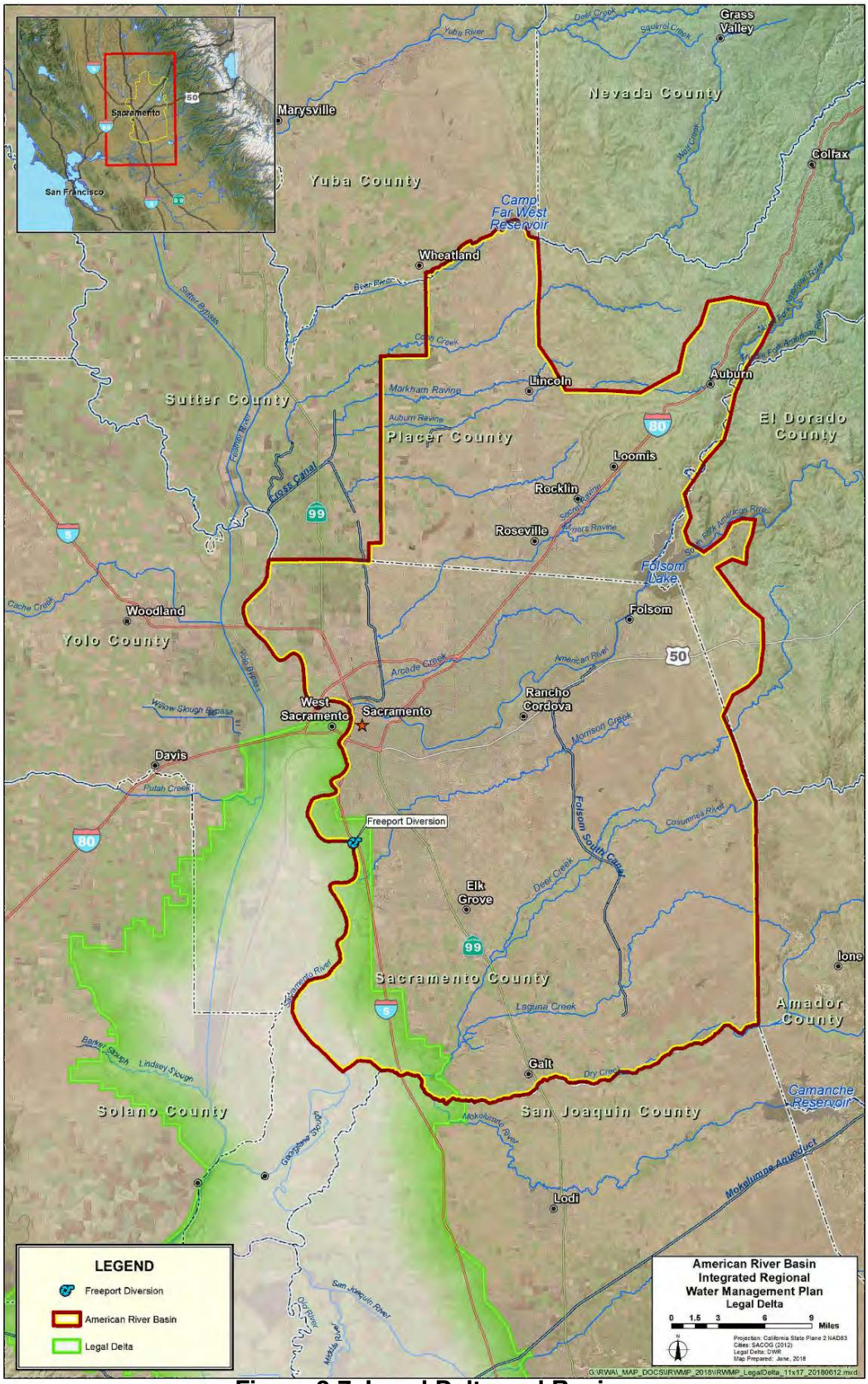


Figure 2-7. Legal Delta and Region

2.4. Adjacent Areas

The areas adjacent to the Region include Yolo, Sutter, Yuba, and San Joaquin counties. Adjacent IRWM regions include the Cosumnes/American/Bear/Yuba (CABY) Region, Westside (Yolo, Solano, Napa, Lake, Colusa) Region, North Sacramento Valley Region, Mokelumne/Amador/Calaveras Region, Yuba County Region, and Eastern San Joaquin Region. **Figure 2-8** displays the adjacent IRWM planning regions. Interregional coordination and relationships with these adjacent IRWM regions are described in **Section 3.4**.

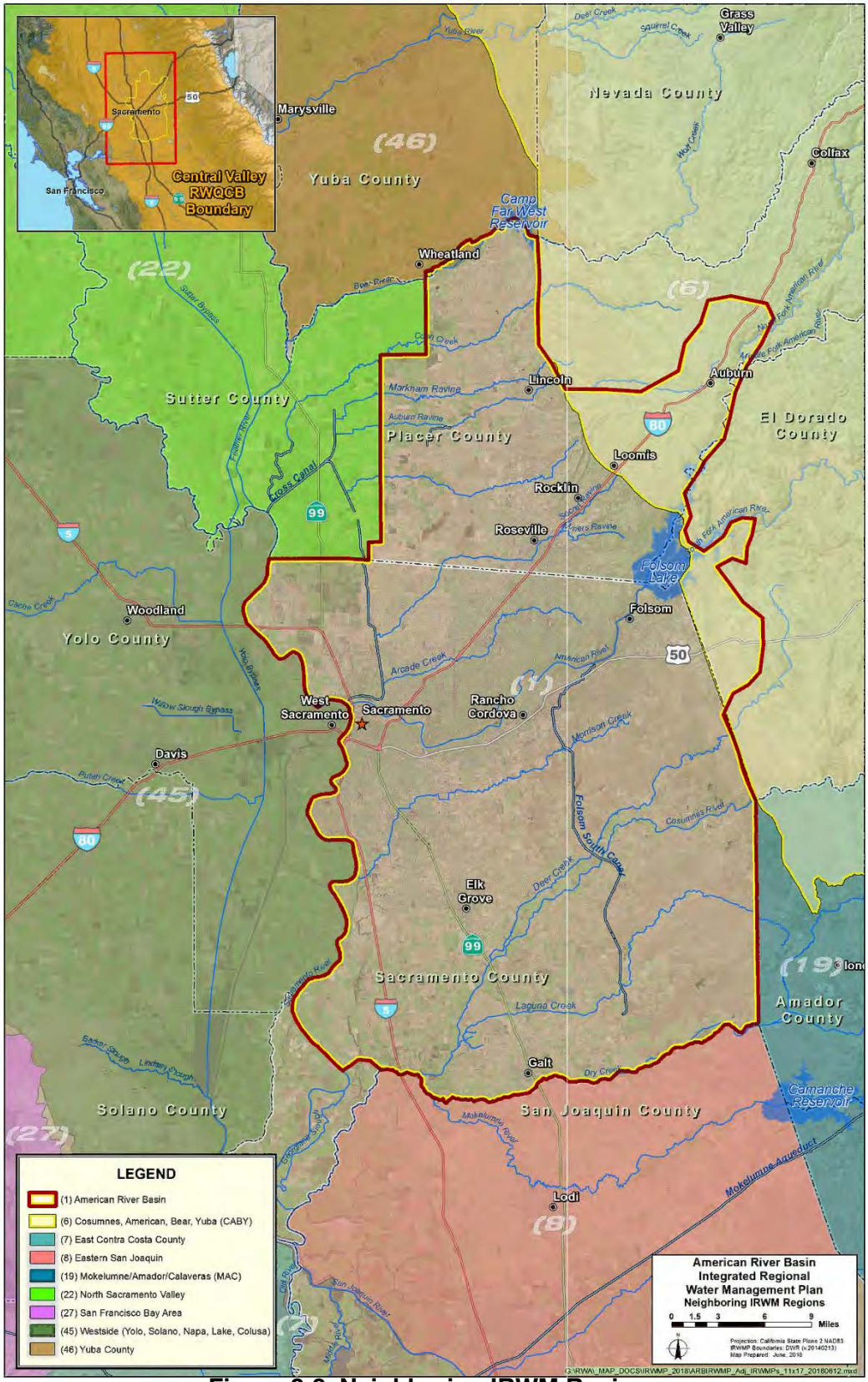


Figure 2-8. Neighboring IRWM Regions

2.5. Regional Economic Conditions and Trends

This subsection describes the economic, demographic, and development trends of the Region. These trends provide a context for and help portray and justify the water resources-specific needs and concerns, characterized in the remainder of **Section 2**.

This subsection reflects information gathered from a variety of sources and agencies. Land-use data are from the U.S. Department of Agriculture. Population and growth projection data are from Sacramento Area Council of Governments[1] (SACOG). Regional income, ethnic makeup, and disadvantaged communities (DAC) descriptions are derived from U.S. Census data. Employment data are from the California Employment Development Department, and housing and population data are from the Demographic Research Unit of the California Department of Finance, which is the official source of demographic data for State of California (state) planning and budgeting. Finally, agricultural and urban land-use and growth data are from California Department of Conservation.

The Region encompasses Sacramento County, the western portion of Placer County, and the El Dorado Hills portion of El Dorado County. There are multiple overlapping jurisdictional boundaries, primarily at the county level in the ARB. These data are included in this report when it refers to counties, unless otherwise noted. Data are disaggregated for the ARB-specific region, where possible. The higher elevation portions of Placer and El Dorado counties and other adjacent geographies are part of the CABY Region. The Region's working relationship and coordination efforts with CABY are described in **Section 3.4.2**.

2.5.1. General Land-Use Information

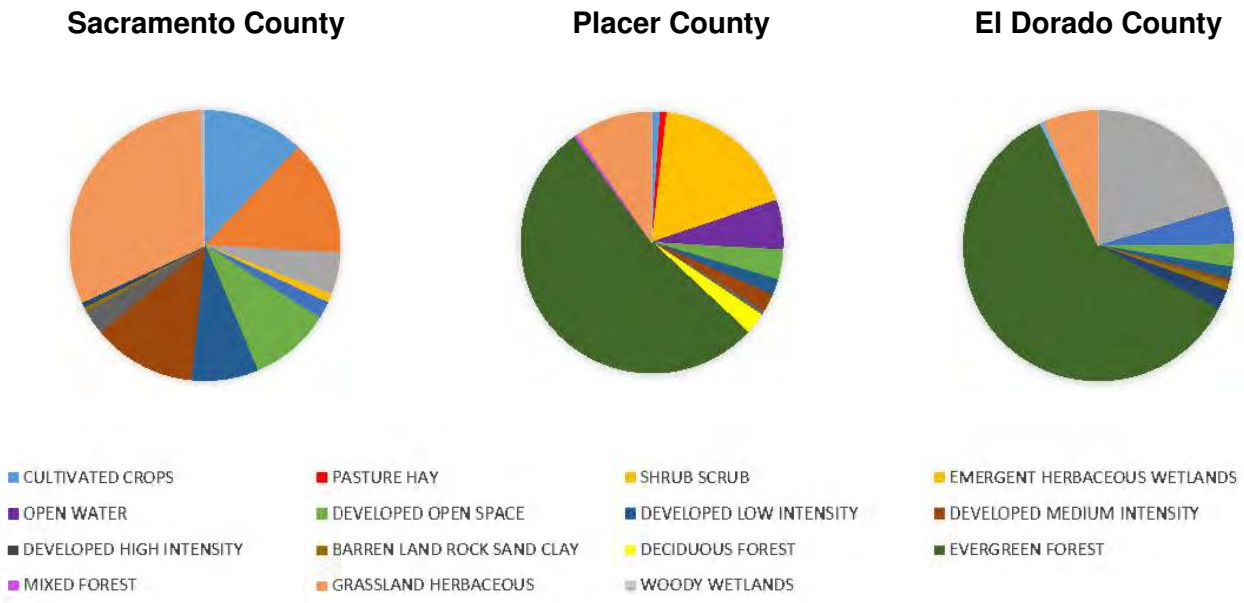
The Region has historically supported agriculture, with the City of Sacramento located at the confluence of the American and Sacramento rivers serving as the regional hub since the gold rush era and the State Capital since 1879. In the past several decades, urban and residential development have spread from the City of Sacramento proper outward—upstream and easterly, along the American River toward Folsom and El Dorado Hills; north into the Natomas Basin and western Placer County, and south along Interstate 5 and Highway 99 through the City of Elk Grove (Elk Grove) toward the City of Galt (Galt). The Region is defined in part by the extent of planned urban boundaries.

Figure 2-9 shows the pattern of urban development in the Region. The land uses in Sacramento County are a mix of urban and agriculture. While Placer and El Dorado counties have significant urban areas in the lower elevations, agricultural and forest products are the predominant land uses in the remainder of these

[1] SACOG demographic and land-use data and projections are cited in this subsection, as these are the data used by planning agencies in this region. An association of local governments, SACOG plans and funds regional transportation for the six-county Sacramento region, which includes Sacramento, Placer, El Dorado, Yuba, Sutter, and Yolo counties. SACOG data exclude the Tahoe Basin region of El Dorado and Placer counties.

counties. The total land area encompassed by Sacramento, Placer, and El Dorado counties is approximately 2.7 million acres. The Region consists of the western, downstream, and more developed half of this area, as Sacramento County accounts for approximately 629 thousand acres—a fraction of the three-county area. While data for El Dorado and Placer counties are reported, Sacramento County's land-use breakdown is the most representative overall for the Region, given overlaps and land uses.

A more detailed discussion on the trends in farmland conversion in the Region can be found in **Section 2.5.6.2**.



Data Source: 2017 Cropland Data Layer, USDA National Agricultural Statistics Service

Figure 2-9. 2017 Land Use by County

2.5.2. Population

Following World War II, the population of California increased steadily and in some cases explosively, particularly in Southern California. Similarly for the Sacramento area, the Cold War era, the Korean War, and Vietnam War brought employment opportunities in manufacturing and at nearby defense installations, attracting tens of thousands of people to the Region. The population of the Region continues to increase for many reasons, partially for economic opportunities (described in **Section 2.5.3**), available affordable housing (described in **Section 2.5.5**), quality of life, and recreational opportunities. **Table 2-3** summarizes the 2010 and 2016 population by county and highlights larger cities in the Region.

Table 2-3. 2010 and 2016 Population by Area

Area	2010 Population	2016 Population Estimates
El Dorado County	181,058	184,371
Placer County	348,432	376,203
City of Lincoln	42,819	47,268
City of Roseville	118,788	133,618
City of Rocklin	56,974	61,672
Town of Loomis	6,430	6,715
City of Auburn	13,330	14,066
Sacramento County	1,418,788	1,496,619
City of Sacramento	466,488	486,111
City of Citrus Heights	83,301	86,372
City of Elk Grove	153,015	168,118
City of Folsom	72,203	77,310
City of Rancho Cordova	64,776	72,267
Total (3-County Region)	1,948,278	2,057,193

Data Source: California Department of Finance (2018).

Based on data collected by SACOG in 2018, the Region's population is expected to continue growing significantly between 2012 and 2035. Sacramento County is expected to grow about 34 percent between 2012 and 2035, Placer County is expected to grow about 48 percent, and El Dorado County is expected to grow about 26 percent. As a whole, the three-county region (excluding the Tahoe Basin) is expected to grow about 35 percent. These overall projections apply directly to the Region. The projected increase in population demonstrates a continued and increasing need throughout the Region to examine and maintain reliable water resources, supporting infrastructure, and management systems. The SACOG growth projections are presented in **Table 2-4**.

Table 2-4. SACOG Population Projections by County

Area	2012	2020	2035
Sacramento	1,402,302	1,517,200	1,879,302
Placer	346,984	397,250	512,043
El Dorado	151,639	165,523	191,549

Data Source: SACOG 2018.

2.5.3. Employment

Employment in the Region consists primarily of service sector employment, as shown in **Tables 2-5** through **2-7**. State and federal governments are also large employers in the Sacramento area. The number employed in Sacramento County is four times that of Placer County and thirteen times of that of El Dorado County. This pattern portrays that the greater Sacramento area serves as the hub for economic opportunities.

Sacramento, Placer, and El Dorado counties have experienced economic growth during the last five years. This growth is consistent with statewide and national trends in employment statistics following the economic recession and downturn. From 2010 to 2016, all three counties experienced annual decreases in unemployment rates, with 2016 employment rates in the single digits. The total number of jobs increased by about 15 percent in the three counties since 2010. A description of employment and economic conditions of the Region is important for the public as a whole, but also for those agencies that serve them. After multiple years of increasing employment and corresponding housing demand, water-related projects in the Region have slowly increased.

Table 2-5. Sacramento County Employment Summary

Year	Total Jobs	Agriculture	Goods Production	Services	Unemployment Rate
2005	600,600	2,700	76,900	521,100	5.0%
2006	614,700	2,700	68,800	543,100	4.8%
2007	615,200	2,900	65,200	547,000	5.4%
2008	599,900	2,700	57,200	540,000	7.2%
2009	567,500	2,700	47,500	517,300	11.3%
2010	550,400	2,600	42,900	504,900	12.7%
2011	543,800	2,600	42,500	498,800	12.1%
2012	576,600	2,600	44,900	529,000	10.5%
2013	587,600	2,600	48,100	537,000	8.9%
2014	599,800	2,600	49,900	547,300	7.3%
2015	621,300	2,700	51,900	566,700	6.0%
2016	644,000	2,000	54,300	587,500	5.4%

Data Source: California Department of Employment Development 2018

Table 2-6. Placer County Employment Summary

Year	Total Jobs	Agriculture	Goods Production	Services	Unemployment Rate
2005	137,300	600	26,100	110,600	4.3%
2006	140,100	400	25,100	114,600	4.2%
2007	140,400	300	23,300	116,700	4.8%
2008	136,900	400	20,300	116,200	6.4%
2009	126,300	300	16,300	109,600	10.4%
2010	126,200	300	15,100	110,900	11.5%
2011	126,500	400	14,500	113,400	10.8%
2012	133,700	300	14,900	118,500	9.4%
2013	141,400	400	16,000	125,000	7.7%
2014	146,400	300	16,800	129,300	6.3%
2015	153,300	300	18,800	133,200	5.0%
2016	160,000	300	20,600	139,100	4.4%

Data Source: California Department of Employment Development 2018

Table 2-7. El Dorado County Employment Summary

Year	Total Jobs	Agriculture	Goods Production	Services	Unemployment Rate
2005	51,300	400	7,800	43,100	4.8%
2006	52,700	400	8,100	44,200	4.6%
2007	53,500	400	8,200	45,000	5.2%
2008	52,200	300	7,200	44,700	6.9%
2009	48,700	300	5,300	43,100	11.1%
2010	47,100	300	4,700	42,100	12.4%
2011	46,100	200	4,500	41,400	11.8%
2012	48,200	400	4,700	43,200	10.2%
2013	50,000	500	5,100	44,500	8.5%
2014	50,900	500	5,300	45,100	7.0%
2015	48,900	500	6,300	42,100	5.7%
2016	46,800	300	6,800	39,800	5.1%

Data Source: California Department of Employment Development 2018

2.5.4. Income

This subsection summarizes household income as it relates to economic conditions of the Region. Economic trends relating to household income are discussed, along with information about disadvantaged communities within the Region. Along with employment, household income is an indicator of the capacity of the local economy and local agencies to invest in necessary water resources, infrastructure, and services.

2.5.4.1. Regional Income Data

The median household income increased for all counties when compared to the median household income as reported in the 2010 U.S. Census (in 2010 dollars). **Table 2-8** shows the median household income for the three-county Region as reported in the U.S. Census 2000 report, 2010 report, and 2016 estimates.

Table 2-8. Regional Median Income Data

Year	El Dorado	Placer	Sacramento
2000 (1999 dollars)	$51,484	$57,535	$43,816
2010 (2010 dollars)	$66,129	$67,884	$52,709
2016 (2016 dollars)	$72,586	$76,926	$57,509

Source: U.S. Census Bureau 2000, 2010b, 2016c

2.5.4.2. Disadvantaged Communities

A DAC is defined as a community with an annual median household income (MHI) less than 80 percent of the statewide annual MHI. According to data from the American Community Survey for the years 2010-2014, $49,191 is 80 percent of the statewide MHI. In addition, those census geographies having an annual MHI that is less than 60 percent of the statewide annual MHI are shown as "Severely Disadvantaged Communities" (SDAC). Region census tracts are small, relatively permanent statistical subdivisions of a

given county that are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

The downloaded data are presented in **Figure 2-10** and summarized in **Table 2-9**. Census tracts do not precisely coincide with the Region boundary. The data presented in **Table 2-9** include all tracts that overlap the Region and thus slightly overestimate the total population. The data show that slightly less than 30 percent of the population lives in DACs. See **Appendix E**, for information on the demographics of DACs and how the Region involved DACs in developing this IRWMP.

Table 2-9. Disadvantaged Community Data

Total Population of Census Tracts Overlapping the Region	Total Population of DAC Census Tracts	Percentage of Population Living in DACs
1,738,876	502,938	28.9

Source: U.S. Census Bureau 2010 as presented by DWR 2013a

Key
DAC = disadvantaged community

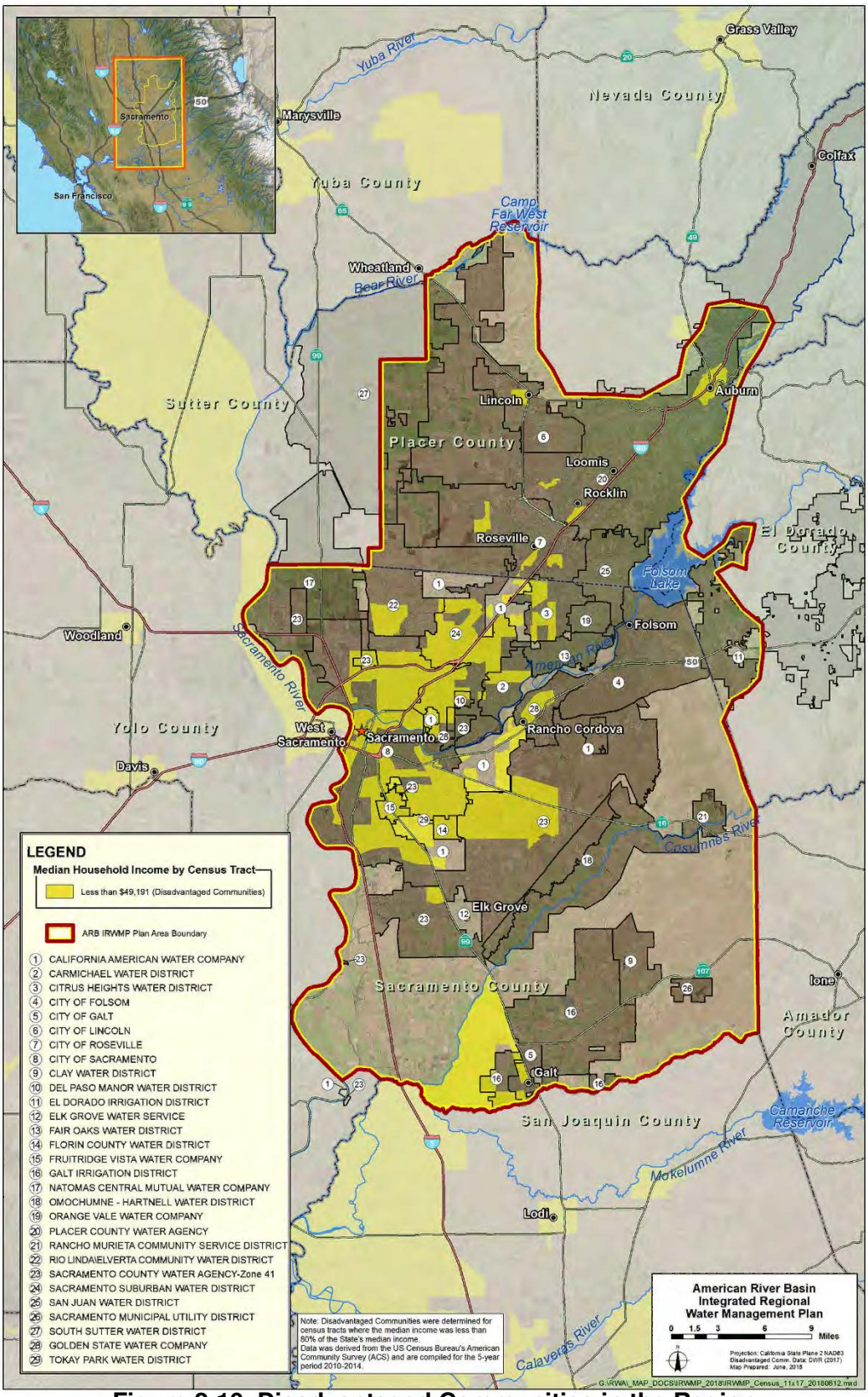


Figure 2-10. Disadvantaged Communities in the Region

2.5.5. Housing

The number of housing units has grown significantly in the Region over the last several decades with urbanization occurring in undeveloped areas that are in commuting distance to the City of Sacramento. As described previously, population growth, economic opportunities, and affordable housing interact and can complement one another. Growth in housing units has steadily increased since 2012. As shown in **Table 2-10**, housing categories showed an increase between 2012 and 2017, with the biggest increase in single family homes.

Table 2-10. Housing Units Estimates–2017

Area	Single Family	Multi-Unit 2–4	Multi-Unit 5 +	Mobile
Sacramento County	401,222	45,019	106,177	14,863
Placer County	131,146	8,421	18,652	4,270
El Dorado County	75,645	4,873	5,730	4,105
3-County Region Total	608,013	58,313	130,559	23,238
Change from 2012	***3%***	***0.3%***	***1.8%***	***0.4%***

Data Source: California Department of Finance 2018

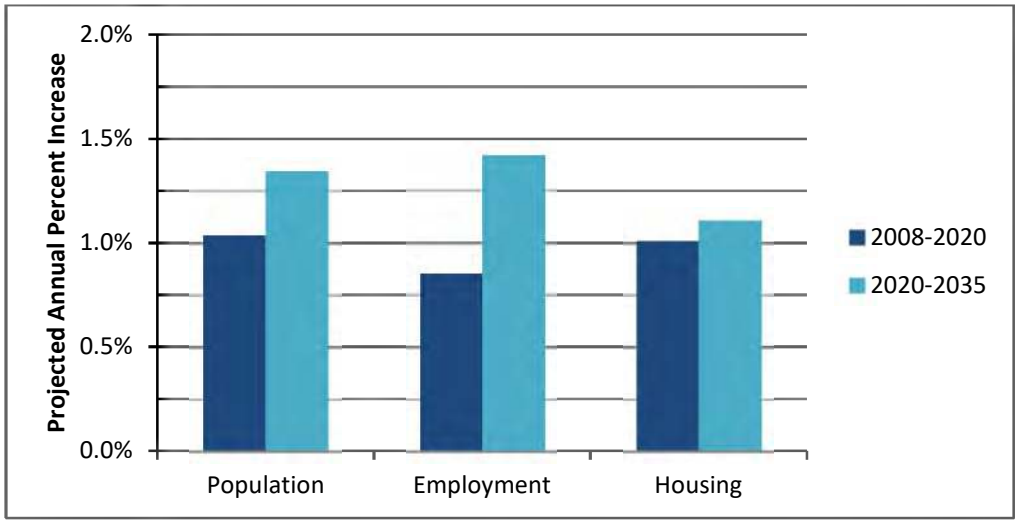
The California Association of Realtors reported that the housing market was expected to show a small increase in 2017, with a one percent increase in home sales in 2018. The organization cites supply shortages and affordability constraints as the main causes hampering marketing activity.

2.5.6. Regional Growth Trends

This subsection discusses regional growth trends that mostly affect water management. Expected population, employment, and housing growth are discussed, followed by a discussion of farmland conversion.

2.5.6.1. Population, Employment and Housing Growth Summary

According to the California Department of Finance's 2014 estimates, the population of the American River Basin portions of El Dorado, Placer, and Sacramento counties will rise to nearly 3 million – a 47 percent increase – by 2060. Population, employment, and housing all have grown and will continue to grow in the near future. **Figure 2-11** is a summary of SACOG's projection for growth trends in population, employment, and housing for the Region. Although growth trends do not reach 2 percent, which was the growth during the late 1990s and the first half of the 2000s, growth rates for both population and employment are projected to increase into 2035. Housing growth rates show a slight increase from 2020 to 2035, compared to the first 12 years (from 2008 to 2020) that were modeled. Continued growth in the Region with constrained natural resources signifies a continued need for increasingly efficient and effective water resources projects to more efficiently serve more people in larger land areas.



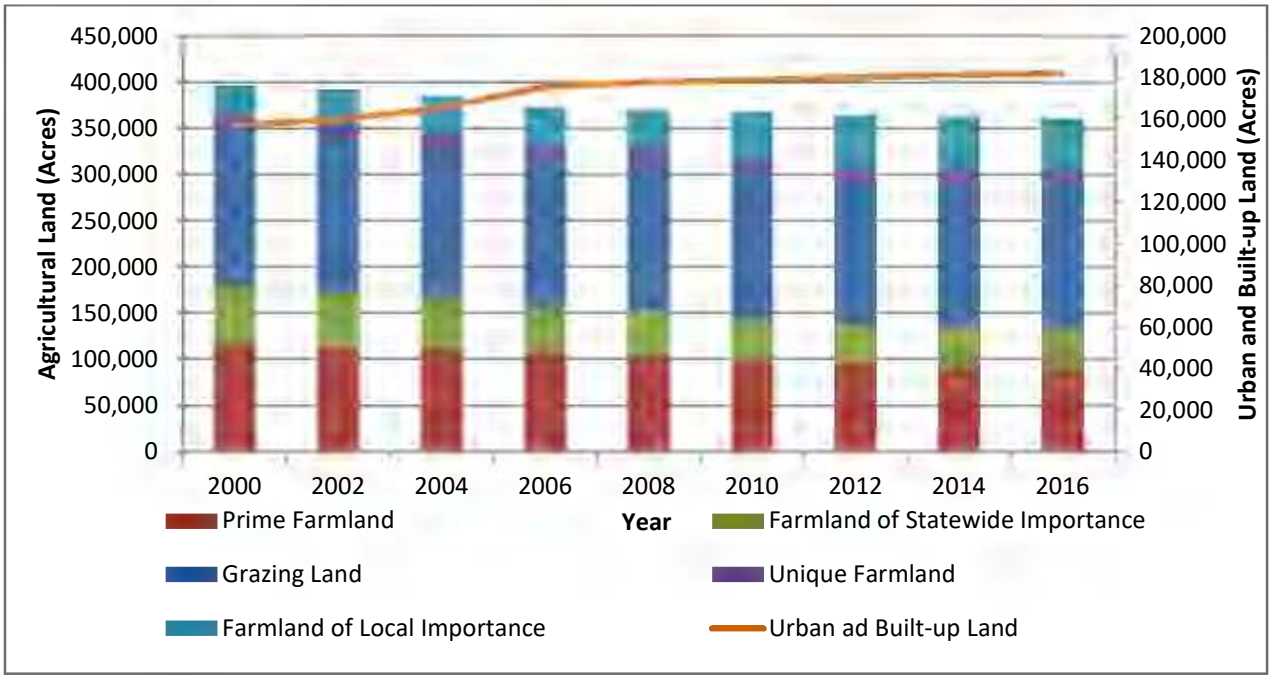
Data Source: SACOG 2012 as presented binthe 2013 ARB IRWMP

Figure 2-11. Regional Growth Trends in Population, Employment and Housing

2.5.6.2. Farmland Conversion

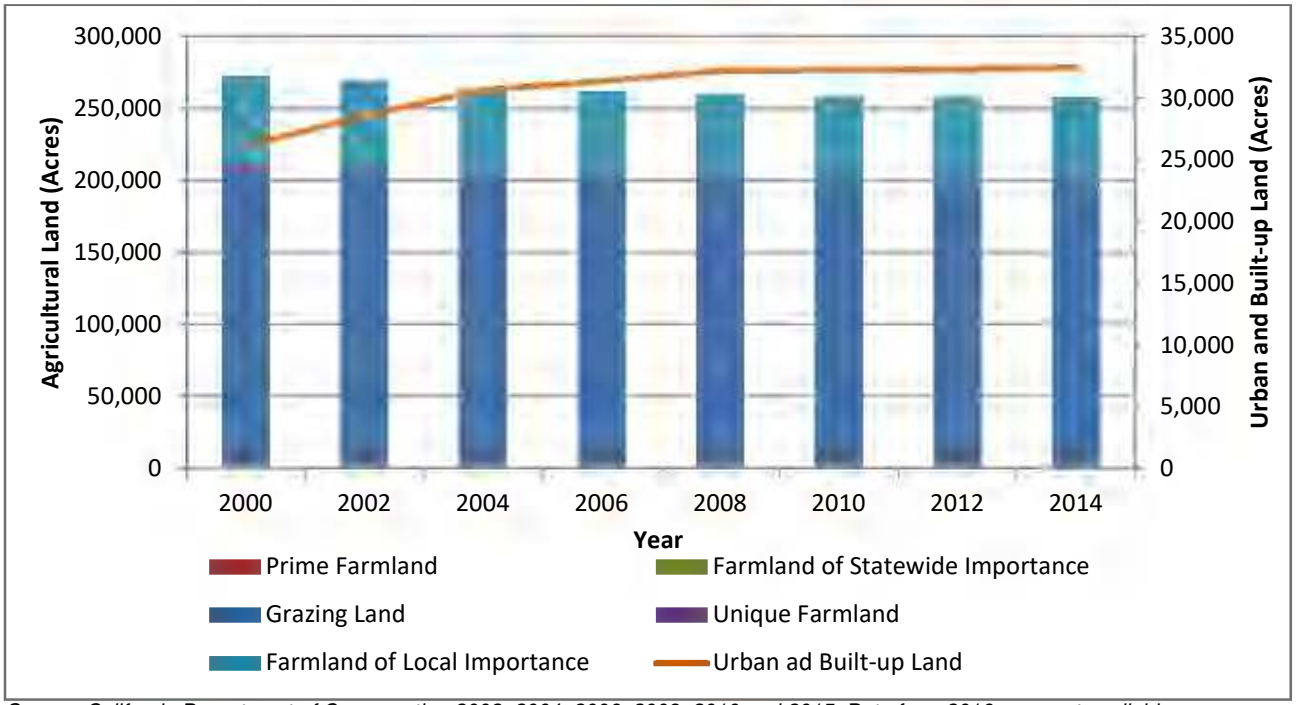
Historically, agricultural operations have been economically important to the vitality of the Region. Fertile soils and a semiarid climate allow for cultivation of a variety of crops (row crops, tree crops, irrigated grains) and raising of livestock (fowl and dairies). In 2015, the aggregated gross crop value for the counties of Sacramento, El Dorado, Placer, and Sutter was over $1.14 billion. Crops grown in the Region include wine grapes, apples, walnuts, timber, rice, and pears. In El Dorado County, commonly grown crops include wine grapes (2,420 acres in 2015), apples (852 acres), pears (107 acres) and timber (181,460 acres).

Economic markets and technological advancements have impacted agricultural markets and farming practices in the Region in recent decades. Spurred by employment and population growth, property once zoned agricultural land has been re-zoned and developed into housing, commercial, and industrial developments. **Figures 2-12** through **2-14** show total acreage for agricultural land (left ordinate) and urban and built-up land (right ordinate) in Sacramento, El Dorado, and Placer counties. Sacramento and Placer counties data are shown for every 2 years from 2000 to 2016. El Dorado County data are from 2000 to 2014 as 2016 data are still under development.



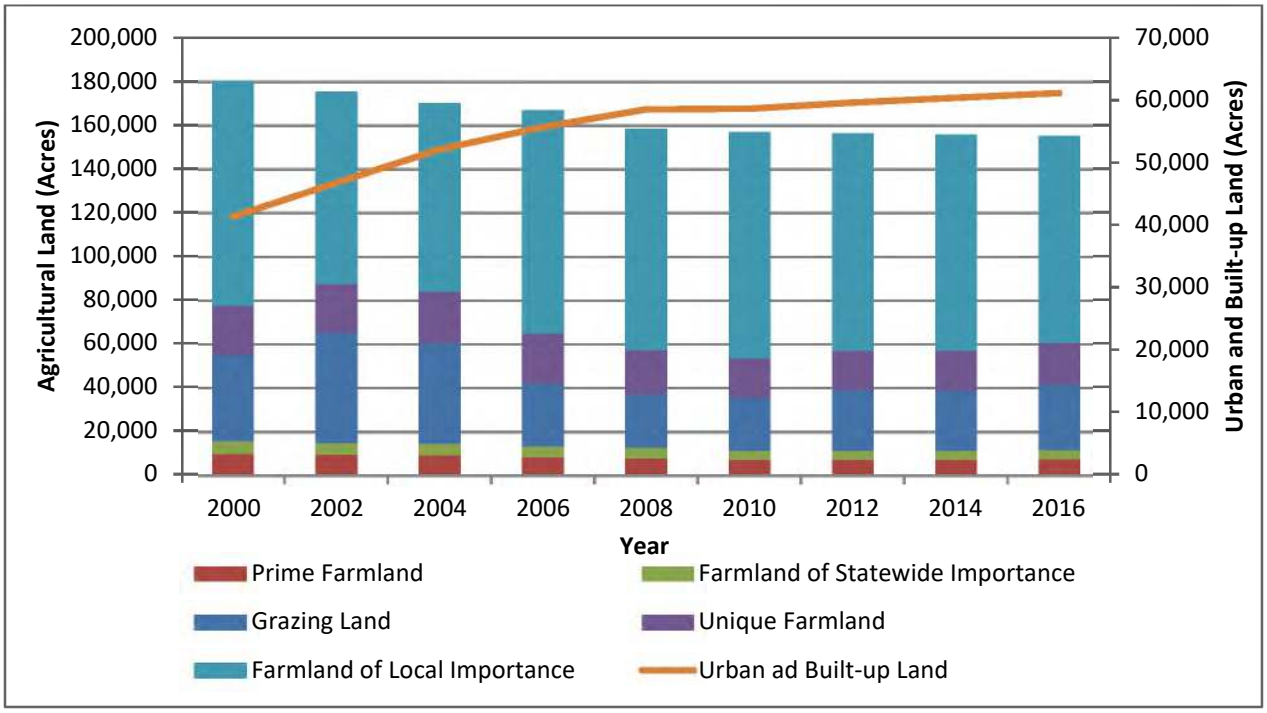
Source: California Department of Conservation 2002, 2004, 2006, 2008, 2010, 2015, and 2016.

Figure 2-12. Sacramento County Agricultural Land and Urban and Built-up Land from 2000 to 2016



Source: California Department of Conservation 2002, 2004, 2006, 2008, 2010 and 2015. Data from 2016 were not available.

Figure 2-13. El Dorado County Agricultural Land and Urban and Built-up Land from 2000 to 2014



Source: California Department of Conservation 2002, 2004, 2006, 2008, 2010, and 2016.

Figure 2-14. Placer County Agricultural Land and Urban and Built-up Land from 2000 to 2016

From 2000 to 2016, Sacramento County converted a total of approximately 35,418 acres of agricultural land. Urban and Built-Up Land increased from 2000 to 2006, but has remained steady from 2006 to 2016, likely due to the completion of already approved development. Agricultural land in Placer and El Dorado counties have also steadily decreased since 2000. Approximately 14,404 acres of agricultural land were lost in El Dorado County from 2000 to 2016, and approximately 25,098 acres of agricultural land were lost in Placer County from 2000 to 2016. From 2000-2014 in El Dorado County, approximately 6,353 acres of Urban and Built-up Land were added, whereas from 2000-2016 approximately 19,768 acres of Urban and Built-up Land were added in Placer County.

As population growth and urban development continue in the future, the density or efficiency of development (as measured by people per urban acre developed) will be a key factor identified in limiting impacts to existing agricultural land. The recent trend in all three counties is increasingly dense and efficient development relative to existing and previously urbanized lands (American Farmland Trust 2007).

2.5.7. Social and Cultural Makeup of the Regional Community

This subsection describes the social and cultural makeup of the regional community, including cultural resources, ethnic makeup of the regional community, and important cultural and social values. These values play a critical role in how the Region approaches water management issues.

2.5.7.1. Cultural Resources

Cultural resources include physical resources and intangible cultural values pertaining to paleontology, prehistoric and historic archaeology, history, and Native American ethnography. Paleontological resources include fossil animals and plants of scientific value. Archaeological resources include evidence of past human activities, both prehistoric and historic. Historic resources also include extant structures. Ethnographic resources may include natural or cultural resources, landscapes, or natural environmental features that are linked by a community, or group of communities, to the traditional practices, values, beliefs, history, and/or ethnic identity of that community or wider social group.

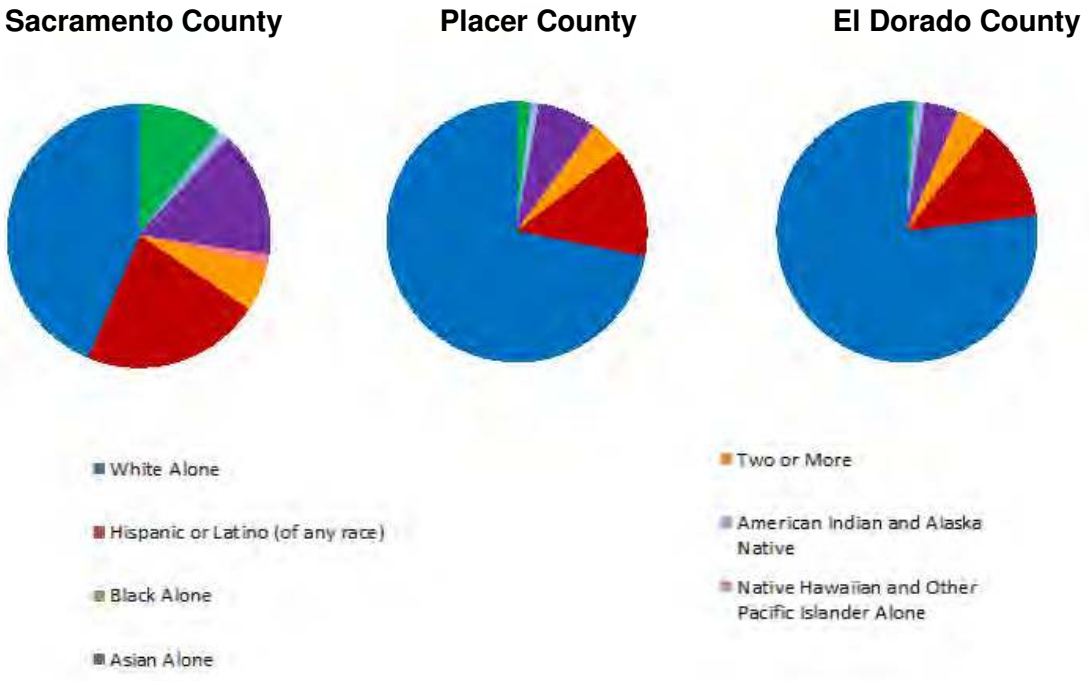
Several dozen prehistoric sites have been identified along the lower American and lower Sacramento rivers. These include village sites, bedrock milling stations, lithic scatters, and small campsites. More than a hundred prehistoric sites have been identified within the Folsom Reservoir Basin. Of particular concern are sites located in reservoir inundation areas. Such sites are subject to degradation due to reservoir siltation, erosion from fluctuating surface water elevations, and vandalism when exposed by low surface water elevations.

Historic sites along the lower American River and lower Sacramento River include placer mining districts, railroad-related structures, irrigation and hydroelectric facilities, and historic residential structures.

Ethnographic resources include historic Nisenan (southern Maidu) village sites located along the lower Sacramento and lower American rivers. Many archaeological sites in the area contain burials, and human remains are of substantial concern to contemporary Native Americans. Two-federally recognized tribes are located hin the Region. These are the United Auburn Indian Community of the Auburn Rancheria in Placer County and the Wilton Rancheria in Sacramento County according to the U.S. Department of Health and Human Services. See **Section 3.1** for details on the outreach process to Native American tribes.

2.5.7.2. Ethnic Makeup of the Regional Community

The ethnic makeup of the Region and included communities are summarized in **Figure 2-15**. Based on information from the U.S. Census for 2016, Sacramento County is one of the most diverse jurisdictions, with significant populations of white, black, Asian, and Hispanic ethnicities.



Source: U.S. Census Bureau 2016

Figure 2-15. Ethnic Makeup of the Regional Community

Multiple languages are spoken in the Region, especially in Sacramento County. English and Spanish are the prominent languages spoken in Sacramento County. While communication materials in English may be suitable for a majority of residents, alternate languages are often advisable for a large number of potential stakeholders. For instance, public health outreach materials produced by Sacramento County are translated into five languages and some Sacramento area community service providers provide language assistance for up to 10 languages.

2.5.7.3. Important Cultural and Social Values

Identifying and articulating a common understanding of the cultural and social values of the Region were important in developing and updating the IRWMP. **Section 5.4** includes a discussion on how the ARB stakeholders developed and agreed to a list of principles, which are statements that articulate shared organizational values, underlie strategic vision and mission, and serve as a basis for integrated decision making. When agencies or project proponents adopt this ARB IRWMP Update, they are committing to adhere to the spirit of these core values of the Region, as written in the "Resolution of Adoption" (**Section 4.3**). The list of adopted principles is found in **Section 5.4**.

2.6. Water and Environmental Resources Setting

This subsection describes the water and environmental resources setting of the Region. It begins with a description of climate, then characterizes the Sacramento River and the Region's six main watersheds, and

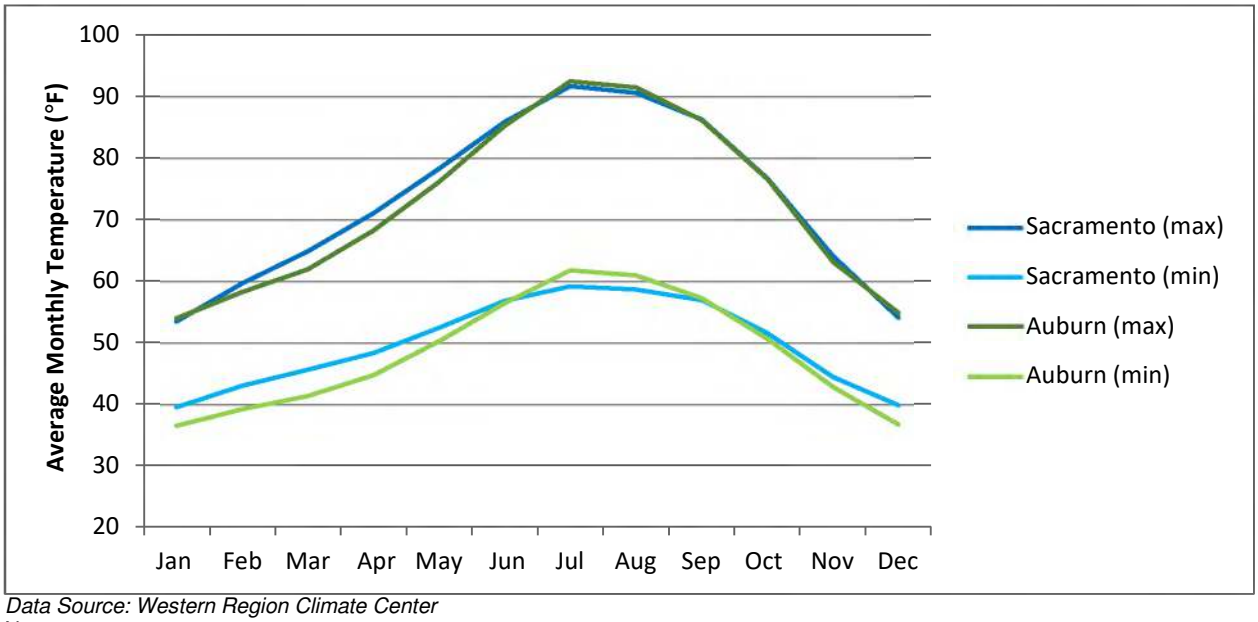
concludes with a description of the three underlying groundwater subbasins. For each watershed, the hydrology, water quality, habitat and species, and watershed management and stewardship are described. The groundwater discussion begins with the overall hydrogeology and water quality characteristics for the entire Region, and then describes each groundwater subbasin.

2.6.1. Climate

The Region has a Mediterranean climate, with hot, dry summers and cool, wet winters. In the winter, daily minimum temperatures average mid-to-upper 30 degrees Fahrenheit (°F) with daily maximum temperatures in the low-to-mid 50s (°F). On record-breaking days, daily minimum temperatures have been recorded below 20°F. In the summer, daily minimum temperatures average in the upper 50s (°F) with daily maximum temperatures in the low-to-mid 90s (°F); however, in some years daily maximum temperatures have exceeded 110°F.

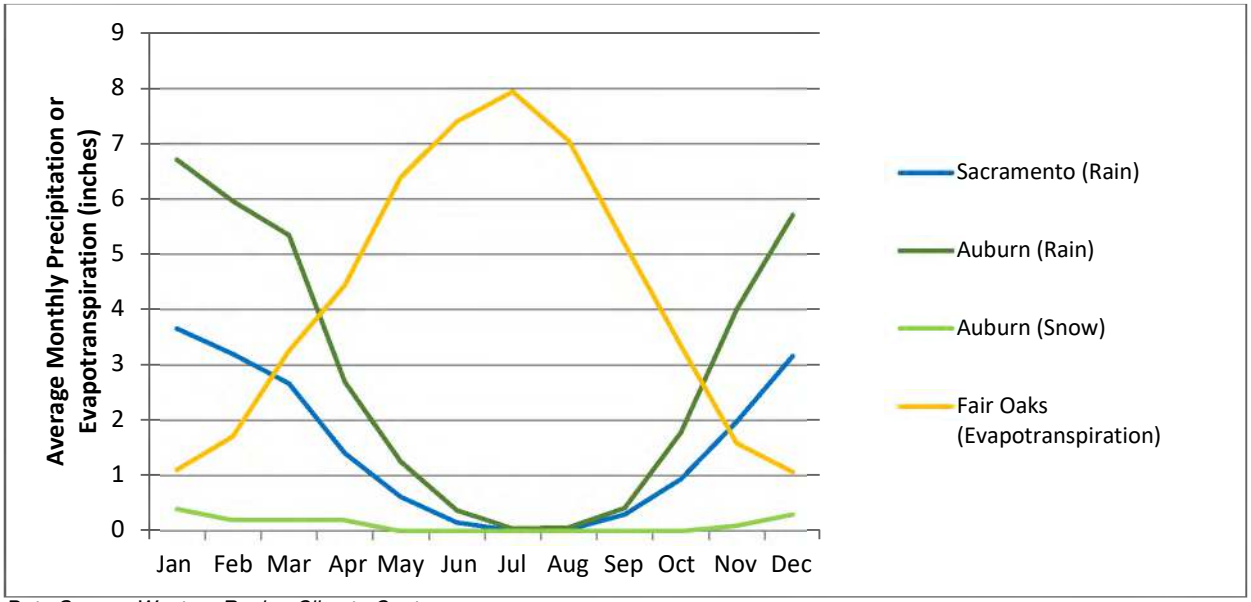
In the Region, the Pacific coastal influence decreases from west to east, causing slightly warmer summers and slightly cooler winters to the east. Average annual precipitation varies primarily with elevation, ranging from around 18.15 inches per year in Sacramento to 34.39 inches per year in Auburn (elevation approximately 1,227 feet above mean sea level). Precipitation also occurs seasonally, as most of the precipitation occurs from November through April. Evapotranspiration also varies seasonally with higher evapotranspiration during the drier and hotter summer months and lower evapotranspiration during the wetter and cooler winter months. The very distinctive cool and wet versus hot and dry seasons dictate much of the human and environmental water needs and concerns in the Region.

Figures 2-16 and **2-17** summarize and show trends for monthly climate data for Sacramento and Auburn stations and evapotranspiration data at Fair Oaks station.



Data Source: Western Region Climate Center
Notes:
Sacramento 2016 https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7633; Station No. 5 ESE (047633)
Period of Record: 7/11/1877 to 6/9/2016
Auburn 2016 https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0383; Station No. 040383
Period of Record: 1/1/1905 to 6/10/2016

Figure 2-16. Average Monthly Maximum and Minimum Temperatures



Data Source: Western Region Climate Center
Notes:
Sacramento 2016 http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7633; Station No. 5 ESE (047633)
Period of Record: 7/11/1877 to 6/9/2016
Auburn 2016 http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0383; Station No. 040383
Period of Record: 1/1/1905 to 6/10/2016
Data Source: DWR/CIMIS
Station No. 131, 2018 Average data derived from CIMIS stations with a period of record: May 1997 – January 2018
Actual evapotranspiration values will vary, and presumably will be lower given the urban land use of the Region.

Figure 2-17. Average Monthly Precipitation and Evapotranspiration

2.6.2. Watershed Characteristics

The Region includes a large portion of the border between two of California's largest hydrologic regions as defined by DWR—the Sacramento River and the San Joaquin River. Approximately, the southern one-third of the Region is in the San Joaquin River Hydrologic Region, and the northern two-thirds is in the Sacramento River Hydrologic Region. **Figure 2-2** shows the watersheds and major hydrologic features of the Region.

The Region includes parts of six subbasins of these hydrologic regions as defined by USDA NRCS. For purposes of this IRWMP, these subbasins are referred to as watersheds.[2] From north to south, the Region watersheds are:

1. Upper Bear
2. Upper Coon-Upper Auburn
3. Lower American
4. Lower Sacramento
5. Upper Cosumnes
6. Upper Mokelumne

The Region recognizes that watersheds are important from a natural hydrology, ecosystem, and pollution transport perspective. As low impact development (LID), stormwater runoff, and flood management considerations become increasingly a central issue, an understanding of the water and environmental resources setting from a watershed standpoint becomes critical.

In the following subsections, the Sacramento River, which defines the western border of the Region, is described first. Subsequently, the hydrology, water quality, habitat and species, and watershed management and stewardship of each of the six watersheds are described in detail. For clarity, **Figure 2-18** displays the rivers and streams in the Region in a simplified form. The rivers and creeks are grouped and numbered in the order that they are discussed. Arrows indicate those rivers and streams that receive inflows from watersheds or watershed areas outside the Region. Habitat and species information that applies to the entire Region are described in **Appendix B**. This appendix includes lists of sensitive plant and animal species and

[2] This distinction is only made here because of common usage of the term watershed. These areas are subunits of much larger watersheds, but they are referred to locally as watersheds because they each include distinct drainage areas and tend to have other distinct characteristics.

habitats that are candidates for, or listed as, rare, threatened, or endangered under the federal Endangered Species Act and/or the California Endangered Species Act. **Appendix B** also includes a list of invasive species of concern.

Figure 2-18 and the narrative descriptions of streams and creeks in the following subsections are not exhaustive; rather, only the larger and regionally important streams and creeks are discussed. Smaller, local creeks and streams are shown in figures under each watershed description below, which are more detailed views of the watersheds shown in **Figure 2-2**.

Discussions in **Sections 2.7** through **2.9** are organized by jurisdictional boundaries, because flood management, water delivery, and wastewater agency jurisdictions often do not follow watershed boundaries. Nonetheless, effects and influences of water management projects and programs span across both watershed and political/jurisdictional boundaries.

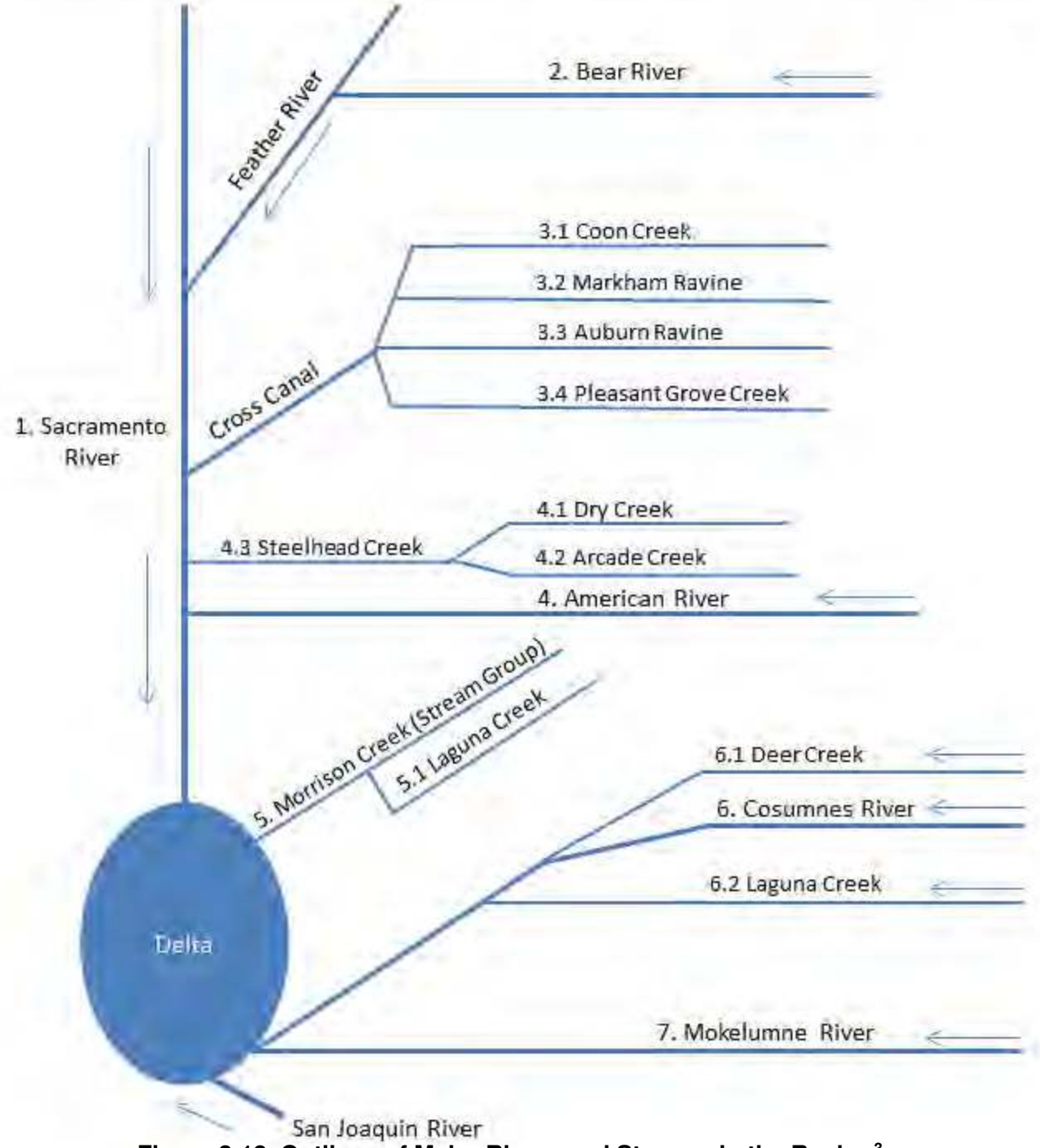


Figure 2-18. Outlines of Major Rivers and Streams in the Region[3]

2.6.2.1. Sacramento River

The Sacramento River (see **Figure 2-18**) is an important river statewide, collecting approximately one-third of the total runoff of the state and discharging it into the Delta. This large area is defined in **Figure 2-2** as

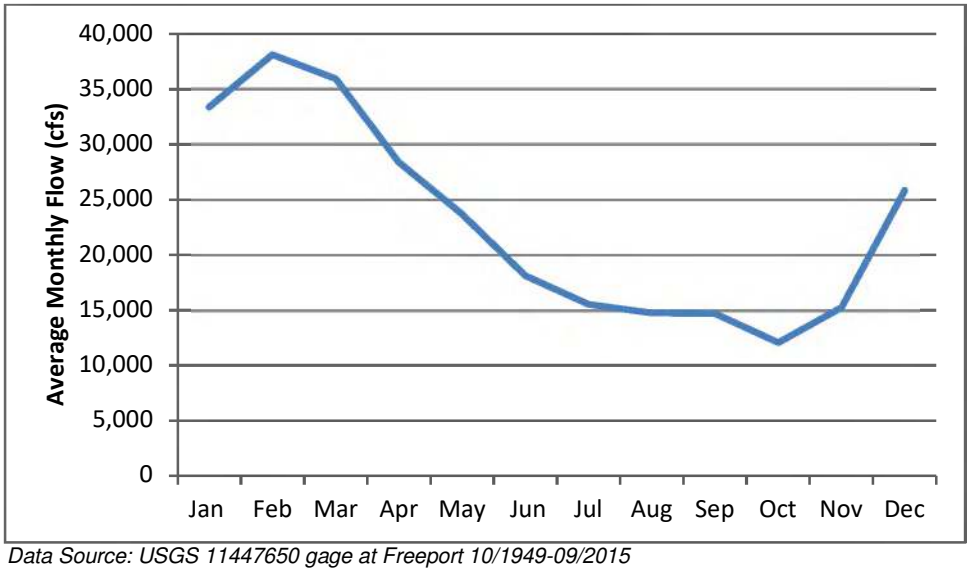
[3] Dry Creek and Arcade Creek are tributaries of the lower American River. However, the creeks flow into the Steelhead Creek, also known as the Natomas East Main Drainage Canal, which has been channelized and altered to discharge directly into the Sacramento River. Therefore, Dry Creek and Arcade Creek never meet the main lower American River.

the Sacramento Hydrologic Region. The lower Sacramento River defines the western boundary of the Region and is described in this subsection as a river, instead of a watershed, to characterize this boundary. Albeit having a similar name, the Lower Sacramento Watershed is a smaller watershed delineation within the larger Sacramento Hydrologic Region. This watershed includes area on both sides of the lower Sacramento River, and only the smaller Morrison Creek Stream Group lies within the Region. This stream group of the Lower Sacramento Watershed is described in **Section 2.6.2.5**.

Sacramento River: Hydrology

The lower Sacramento River is defined as the portion of the river from Princeton to the Delta, at approximately Chipps Island. Flows in the lower Sacramento River are largely controlled by Shasta Dam and Keswick Dam on the upper Sacramento River. Shasta Dam provides flood protection for the Sacramento area, and is part of the Central Valley Project (CVP) constructed by U.S. Army Corps of Engineers (USACE) and operated by U.S. Department of the Interior, Bureau of Reclamation (Reclamation). The portion of the lower Sacramento River that forms the western border of the Region is predominantly channelized, leveed, and bordered by agricultural lands and by the City of Sacramento and Sacramento County.

Sacramento River flow varies following the seasonal variation in precipitation. **Figure 2-19** displays the average monthly flows at the Freeport U.S. Geological Survey (USGS) gage. Average flows during the winter months can be three times that of the summer months. Average annual flows can also vary from around 8,000 cubic feet per second (cfs) to more than 46,000 cfs.



Data Source: USGS 11447650 gage at Freeport 10/1949-09/2015
Key: cfs = cubic feet per second

Figure 2-19. Average Monthly Flows at Freeport

To assist in water planning in the Delta given the high variability in Sacramento River water flows, the State Water Resources Control Board (State Water Board) developed the Sacramento Valley Water Year Index in 1995. The Water Year Index is used to determine water year types for the Sacramento Valley as implemented in State Water Board Decision 1641, and is dependent on runoff into the Sacramento River at major tributary points. The record of the distribution of Sacramento Valley water year types portrays the historic probability of occurrence of various hydrologic years. This is shown in **Table 2-11**.

Table 2-11. Sacramento Valley Water Year Types and Occurrence (1906 – 2017)

Water Year Type	Occurrence Frequency	Most Recent Occurrence (Water Year)
Wet	37 out of 112 years (33%)	2017
Above Normal	15 out of 112 years (13%)	2005
Below Normal	21 out of 112 years (19%)	2016
Dry	23 out of 112 years (21%)	2013
Critical	16 out of 112 years (14%)	2015

Data Source: DWR/CDEC, 2017

A water year designation can be important for water supply, as Reclamation's CVP yearly water availability to various water agencies is partially determined by hydrology. This is further explained in **Section 2.9.2.1**.

The lower Sacramento River flows are managed, in part, for environmental, water quality, and ecosystem purposes. Sufficient flow must be available during the spring and fall months when a variety of anadromous fish are en route to the Delta or upstream spawning and rearing grounds. There are additional smaller-scale minimum flow discharge requirements to help meet environmental needs. Discharge permits for WWTPs located along the lower Sacramento River and its tributaries specify discharge flow and quality during low-flow periods. For example, SRCSD is required to regulate discharge from the Sacramento Regional WWTP (SRWWTP) to ensure a minimum 1,300 cfs in the Sacramento River and a minimum flow ratio of 14:1 (river flow: effluent) to allow for adequate mixing of effluent for environmental needs (SRWWTP National Pollutant Discharge Elimination System [NPDES] Permit 2016).

Sacramento River: Water Quality

The lower Sacramento River water quality is influenced by the entire upstream drainage area, and is affected by agricultural runoff, acid mine drainage, stormwater discharges, municipal and industrial wastewater discharges, water releases from dams, diversions, and urban runoff. However, the river's flow volumes generally provide sufficient dilution to prevent concentrations of contaminants in the river from reaching elevated levels that affect human health. Total Maximum Daily Loads (TMDL) and Water Quality Control Plan amendments for diazinon are in place for the entire lower Sacramento River. Other water quality

parameters of concern, according to the State Water Board's 303(d) listing[4] of impaired water bodies, consist of chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, mercury, and polychlorinated biphenyl (PCB) (State Water Board 2017). Historically, sediment transport from hydraulic gold mining has been an issue, but sediment supply to the Sacramento River has declined over recent years because dams on tributaries and other water management actions have resulted in less sediment transport (DWR 2012b).

Nonetheless, Sacramento River water quality is sufficient for water contact recreation and municipal supply after treatment. The water for potable uses is diverted at the Sacramento River Water Treatment Plant (WTP), located near the confluence of the Sacramento and American rivers, and the intake facility for the FRWP is located further downstream on the Sacramento River.

Sacramento River: Habitat and Species

The lower Sacramento River is used by more than 30 species of native and nonnative fish. Anadromous fish such as adult Chinook salmon and steelhead use the river as a migratory pathway to and from upstream spawning habitats and a migration route to the Delta. Many fish species that spawn in the Sacramento River and its tributaries depend on river flows to carry their larval and juvenile life stages to downstream nursery habitats. Other fish species such as the Sacramento splittail and striped bass use the lower Sacramento River, but make little to no use of the upper river.

An important component of the aquatic habitat throughout the Sacramento River is referred to as Shaded Riverine Aquatic (SRA) Cover. SRA consists of the portion of the riparian community that directly overhangs or is submerged in the river. SRA provides high-value feeding and resting areas and escape cover for juvenile anadromous and resident fishes. SRA also can provide some degree of local temperature moderation during summer months due to the shading it provides to nearshore habitats. The importance of SRA to Chinook salmon was demonstrated in studies conducted by the U.S. Fish and Wildlife Service (USFWS). In early summer, juvenile Chinook salmon were found exclusively in areas of SRA, and none were found in nearby riprapped areas (Water Forum 2005).

Sacramento River: Watershed Management and Stewardship

Numerous organizations exist for managing the entire Sacramento River watershed and its effects on the Delta. Federal and state agencies are often directly involved (e.g., TMDLs), as are research and educational institutions. Independent organizations, such as the Sacramento River Watershed Program, involve

[4] Through the Clean Water Act, the U.S. Environmental Protection Agency (EPA) requires each state to develop a list of impaired waters, called the 303(d) list. Current pollution controls are insufficient to meet water quality standards in these waters, and the state must establish priorities to develop TMDLs to manage this pollution. The State Water Board maintains the state's 303(d) list. The 2014 and 2016 list is available at: https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml.

thousands of people in their mission "to ensure that current and potential uses of the watershed's resources are sustained, restored, and where possible, enhanced, while promoting the long-term social and economic vitality of the region." While the Region coordinates with and is an integral part of the Sacramento River system, management and stewardship concerns of the larger Sacramento River are not fully within the Region's jurisdiction, nor are they the focus of this IRWMP.

2.6.2.2. Upper Bear Watershed

The Upper Bear Watershed is located in portions of Yuba, Nevada, Placer, and Sutter counties and encompasses 474 square miles. Only a small portion of the Upper Bear Watershed (32 square miles) is within the Region. **Figure 2-20** shows the Upper Bear Watershed, its subwatersheds, and their relationship to the Region. While the description below is focused at the watershed level, local stakeholders often work at the subwatershed level and refer to these subwatershed names. As applicable, details of subwatershed information are provided below.

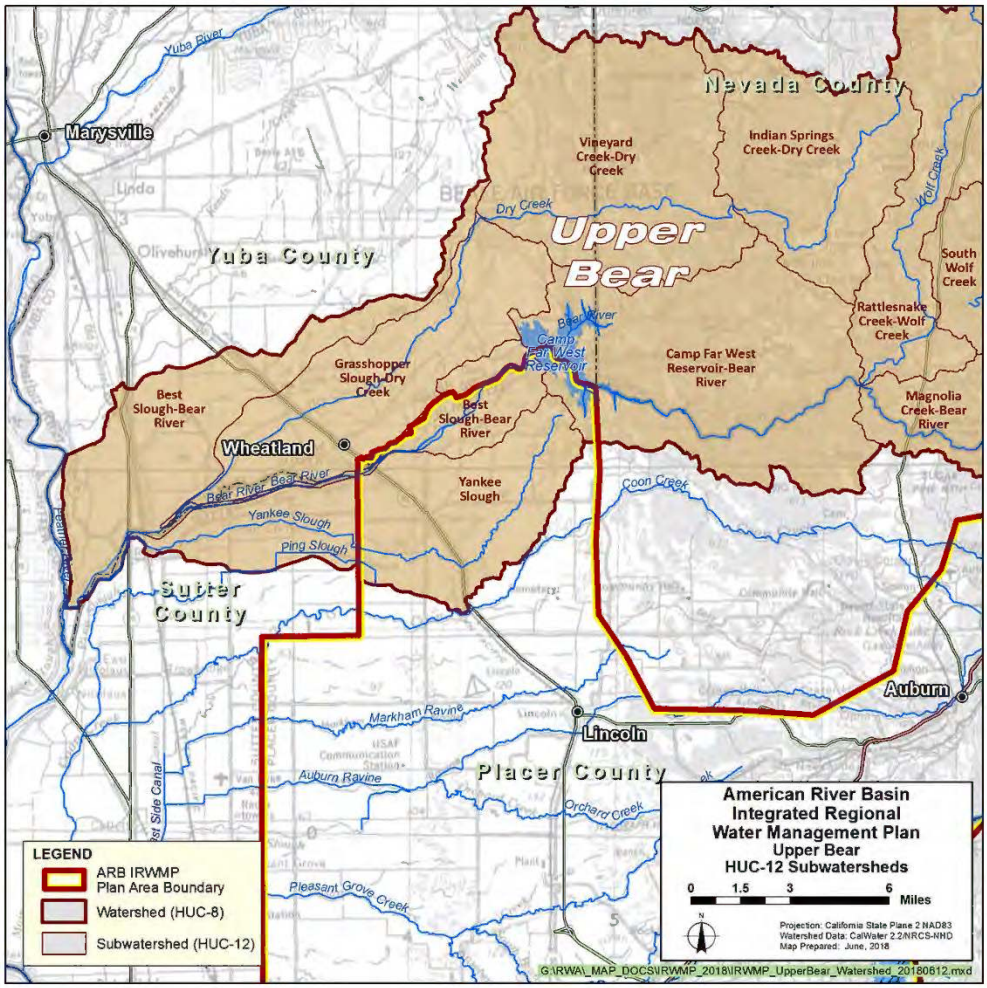


Figure 2-20. Upper Bear Watershed

Upper Bear Watershed: Hydrology

The primary hydrologic feature of the Upper Bear Watershed relative to the Region is the lower Bear River, a segment of river running 15 miles from CFW Reservoir to the confluence with the Feather River to the west. About half of this river segment serves as the northernmost boundary of the Region. CFW is a 104,000-acre-foot reservoir operated by South Sutter Water District for agricultural supply. The operation of CFW has modified the downstream flow regime for both water supply and flood management purposes.

Upper Bear Watershed: Water Quality

Water quality has been sampled in the Bear River and Yankee Slough in the portion of the Upper Bear Watershed that is within the Region. While water quality is considered good for most purposes, there are constituents that exceed protective water quality standards, causing the lower Bear River and Yankee Slough to be placed on the State Water Board's 303(d) listing of impaired water bodies. These pollutants include: chlorpyrifos associated with agriculture; copper and other "unknown toxicity" from unknown sources; and mercury associated with past mining practices in the upper portions of the watershed.

Upper Bear Watershed: Habitat and Species

The Upper Bear Watershed within the Region is dominated by grassland and cropland. A 2009 report by the National Marine Fisheries Service (NMFS) evaluated the lower Bear River for its habitat potential to support salmon and steelhead (NMFS 2009). The report concluded that while the lower Bear River does support winter steelhead rearing habitat near its confluence with the Feather River, this segment is unlikely to support viable self-sustained populations of salmon and steelhead. Issues include reduced flows in this reach of the river from damming and diversions, relatively high water temperatures, lack of spawning gravels, and water quality concerns.

Upper Bear Watershed: Watershed Management and Stewardship

The Bear River Work Group has been actively engaged in the watershed, primarily above CFW Reservoir (see www.bearriver.us for more information). Placer County/Placer Legacy Program (Placer Legacy) actively pursues purchasing properties and conservation easements to protect and conserve open space and agricultural lands. One significant conservation easement in the Region of the Upper Bear Watershed is the 281-acre Kirk Ranch.

2.6.2.3. Upper Coon-Upper Auburn Watershed

The Upper Coon-Upper Auburn Watershed covers 434 square miles (221 square miles within the Region), and is located in western Placer County and the northern Region. **Figure 2-21** shows the Upper Coon-Upper Auburn Watershed and its subwatersheds. This watershed is undeveloped at the higher elevations and is predominantly agricultural in its lower areas. The City of Lincoln (Lincoln) and portions of cities of

Rocklin, Roseville, and Auburn are located in this watershed. These cities have seen one of the highest urban development rates in the Region, converting significant portions of agricultural land into urban land. Downstream from these cities, the watershed flows primarily through flatter agricultural land. Environmental, agricultural, and new development interests present both opportunities and conflicts for watershed management on this landscape, now and into the future.

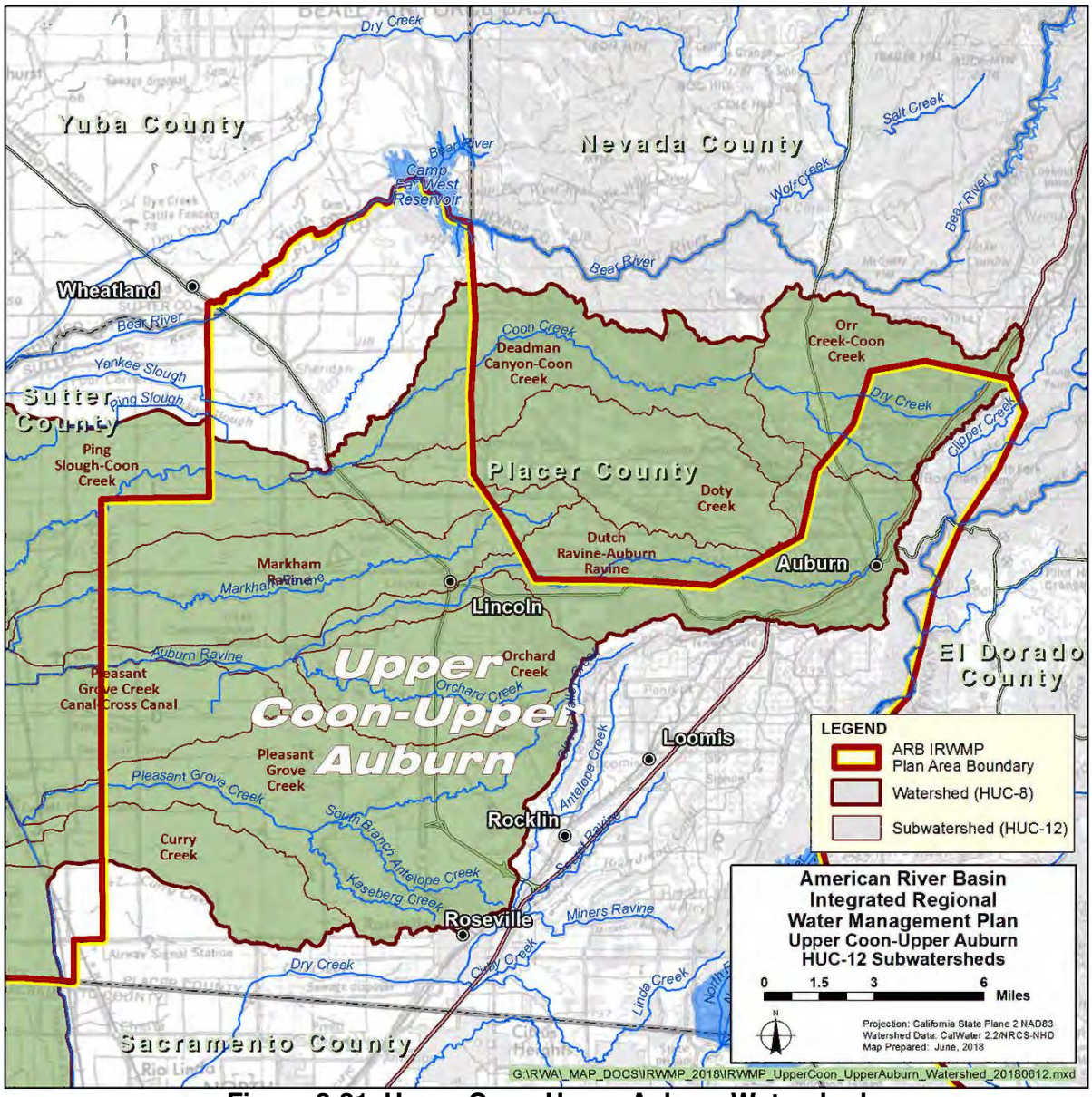


Figure 2-21. Upper Coon-Upper Auburn Watershed

Upper Coon-Upper Auburn Watershed: Hydrology

The Upper Coon-Upper Auburn Watershed does not have one unifying river but has a collection of creeks and ravines that begin in the western Sierra Nevada foothills near Auburn and Loomis and drain into the

Cross Canal and the Sacramento River (see **Figure 2-18**). The four largest of these creeks and ravines are Coon Creek, Markham Ravine, Auburn Ravine, and Pleasant Grove Creek. All of these streams and their subwatersheds are relatively small and have very little natural runoff, outside of times with heavy precipitation and local flooding. Most of the stream flow is water imported from the Yuba, Bear, and American river watersheds to meet domestic and agricultural needs in western Placer County and southeastern Sutter County. While winter stream flows are heavily influenced by runoff from rainfall events, summer flows are influenced by upstream releases for irrigation water deliveries to farms, golf courses, and ranches, and from discharges from wastewater treatment facilities.

While human activity has generally stabilized ephemeral stream flow, floods and critical low flows still occur. Peak winter flows in these subwatersheds can be significantly high: 22,000 cfs in Coon Creek, 5,000 cfs in Markham Ravine, and 17,000 cfs in Auburn Ravine for 100-year events. Flooding in these watersheds is often due to backflow from the Sacramento River and can be severe. Placer County and Lincoln have developed flood management or flood control plans specifically for these creeks. Low flows occur around October, in between the end of the irrigation season and before the start of winter rains. Coon Creek has a constant flow of approximately 9.5 cfs from discharges and water transfers, while Auburn Ravine flows can be low as 1 to 2 cfs below Lincoln (Placer County 2002).

Human activity and importing water have created a unique hydrology and habitat in the Upper Coon-Upper Auburn Watershed (Placer County 2002, 2006). Present water management practices consider energy, irrigation, and wastewater needs but are not integrated with ecological concerns. Flows and water temperatures in Auburn Ravine and Coon Creek are influenced by discharges from WWTPs (NMFS 2009).

Upper Coon-Upper Auburn Watershed: Water Quality

The Upper Coon-Upper Auburn Watershed generally has good water quality. High-quality water is imported from adjoining higher elevation watersheds, improving both quantity and quality of water. The Central Valley Regional Water Quality Control Board (CVRWQCB) has identified beneficial uses to include irrigation, municipal and domestic uses, body-contact water recreation, navigation, and numerous habitat uses. The U.S. Environmental Protection Agency (EPA) 303(d) list, however, identifies several impairments in this watershed. Coon Creek is on the 303(d) list for chlorpyrifos, a pesticide from agricultural sources, *Escherichia coli* (*E. coli*) (a bacterium found in the stomachs of warm-blooded species that can cause food poisoning), and "unknown toxicity," both from unidentified sources. Pleasant Grove Creek has low dissolved oxygen and sediment toxicity from unknown sources as well as pyrethroids, a pesticide, from urban runoff.

Upper Coon-Upper Auburn Watershed: Habitat and Species

Land uses in the Upper Coon-Upper Auburn Watershed include grassland, residential, and agriculture, although some forested areas exist in the foothills in the eastern portion. The watershed supports sporadic riparian and woodland habitats of mixed native and nonnative species along stream corridors, depending upon whether past land use practices allowed remnant woodlands to remain. Seasonal wetlands and vernal pools are scattered throughout the lower elevations of the watershed where soils and topography support them (Placer County 2006). These habitat communities are affected significantly by the invasion of exotic plants, including a variety of nonnative grasses and weedy species in the lower foothills, such as mustard, broom, and Himalayan blackberry.

Conveyance of irrigation water to western Placer and southeastern Sutter counties has created unique summertime habitats not found in other foothill locations. Auburn Ravine has been included in the critical habitat designation for spring-run Chinook salmon and Central Valley steelhead. The California Department of Fish and Wildlife (CDFW, formerly California Department of Fish and Game) has historically stocked Auburn Ravine, Doty Ravine (a Coon Creek tributary), and Coon Creek with fall-run and spring-run Chinook salmon near Lincoln. Although steelhead have not been planted in Auburn Ravine, rainbow trout have been planted in water bodies connected to Auburn Ravine (DWR 2009). Coon Creek in particular has more stable flows year round and pool/riffle complexes, which allow maintenance of water stage and continued support of aquatic habitat. Coon Creek may provide the best opportunity for wildlife habitat restoration (NMFS 2009).

Upper Coon-Upper Auburn Watershed: Watershed Management and Stewardship

There are two active ecosystem restoration plans (ERP) in the Upper Coon-Upper Auburn Watershed: the 2002 Auburn Ravine/Coon Creek (AR/CC) ERP and the 2006 Pleasant Grove and Curry Creek ERP. The Auburn Ravine/Coon Creek Coordinated Resource Management Plan Group developed the AR/CC ERP with assistance from a CALFED Bay-Delta Program (CALFED) grant. Signatories of the Memorandum of Understanding (MOU) included Placer County, Nevada Irrigation District (NID), cities of Lincoln and Auburn, PCWA, South Sutter WD, Placer County Resource Conservation District, Ophir Area Property Owners Association, Placer Nature Center, private property owners, and environmental groups. Placer Legacy was responsible for preparing the Pleasant Grove and Curry Creek ERP.

Since its adoption in 2000, Placer Legacy has been integral in implementing projects related to the ERPs through agricultural easements and land acquisition. It has protected over 9,000 acres. Recent Placer Legay projects include purchase of an agricultural easement on the 49-acre Side Hill Citrus orchard in rural Lincoln and acquisition of the 80-acre Outman Preserve located between Coon Creek and the Bear River

(Placer County 2018). Placer Legacy has also been successful in securing grant funding from sources, such as CALFED and the Sierra Nevada Conservancy.

Several nongovernmental organizations with environmental or watershed interests exist as well. In 2005, the Auburn Ravine/Coon Creek Watershed Group, the Pleasant Grove/Curry Creek Watershed Group, and the Dry Creek Watershed Council (n the Lower American Watershed), formed the American Basin Council of Watersheds (ABCW). ABCW is a group of diverse stakeholders that has continued to meet monthly since 1996. The Dry Creek Conservancy is a nonprofit organization that facilitates watershed conservation, restoration, and education in the watersheds of Dry Creek, Pleasant Grove Creek, Auburn Ravine Creek, Coon Creek, and surrounding areas in Placer, Sutter, and Sacramento counties.

Save Auburn Ravine Steelhead and Salmon (SARSAS) is another nonprofit organization, based in Auburn and is entirely run by volunteers. Its mission is to "return salmon and steelhead to the entire length of the Auburn Ravine," and it has been actively working with Placer County on restoration projects to improve fish passage. One recent successful project is a fish passage installed around a gage station in collaboration with Placer County and NID. SARSAS also provides outreach and educational opportunities to local schools, incorporates traditions of Native tribes related to salmon into their community activities, and monitors and studies Auburn Ravine conditions.

2.6.2.4. Lower American Watershed

The Lower American Watershed covers 293 square miles and is almost completely encompassed in the Region, as shown in **Figure 2-22**. This watershed covers the more developed northern half of the Region. The Town of Loomis and cities of Folsom, Citrus Heights, Rocklin, Roseville, and Rancho Cordova fall entirely or partially within the watershed. The Lower American Watershed has older, built-out urban development closer to the lower American River, while the northern areas around Dry Creek and Arcade Creek and areas closer to Folsom Reservoir have seen high development in the past several years. This trend of development has increased environmental- and flood-related concerns.

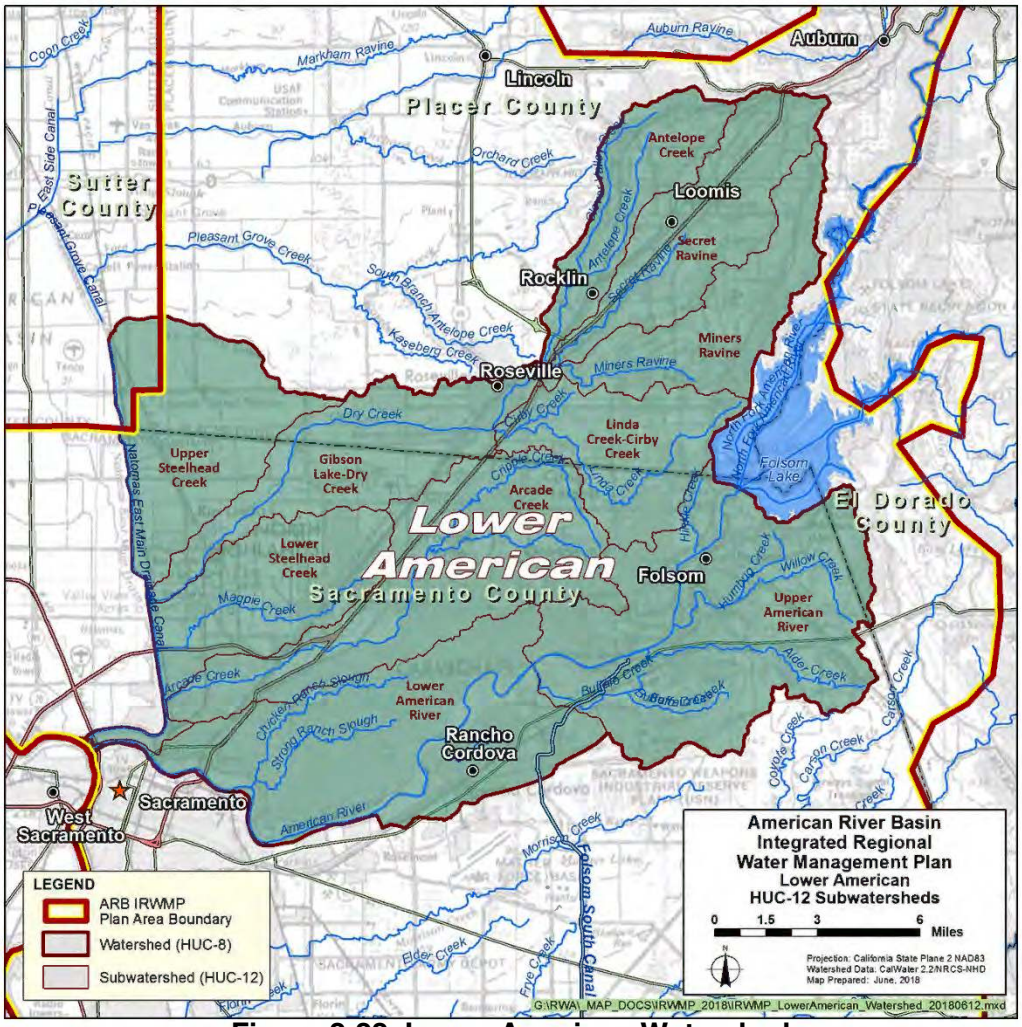


Figure 2-22. Lower American Watershed

The lower American River is the main river that flows through this watershed. It has numerous small tributaries, which are not described in this narrative. Two of the larger creeks are Dry Creek and Arcade Creek, both of which flow into the Natomas East Main Drainage Canal, also known as Steelhead Creek (**Figure 2-18**). Steelhead Creek has been channelized and altered to discharge directly into the Sacramento River. Thus, these smaller creeks in this watershed never meet the main lower American River. Throughout the rest of this Lower American Watershed description, the lower American River system will be discussed first, followed by a description of the Dry Creek, Arcade Creek, and Steelhead Creek system.

Lower American Watershed: Hydrology

Hydrology in the Lower American Watershed follows a wet-winters, dry-summers seasonal pattern and shows high annual variability, due to occasional very dry or wet years. Forty percent of the American River flow is from snowmelt, as this river originates in the Sierra Nevada, farther east of Sacramento County. In contrast, Dry and Arcade creeks flows are seasonal and driven by local drainage and rainfall. The lower

American River is a large tributary to the Sacramento River, accounting for 15 percent of the total flow in the lower Sacramento River (NMFS 2009).

Folsom Dam releases water from Folsom Reservoir, controlling the hydrology of the lower American River. Folsom Dam is an important component of the CVP, and serves multiple purposes, including water supply, hydropower, recreation, flood control, and contributing flows for Delta water quality and ecosystem needs. Folsom Dam is operated, in part, according to inflows into Folsom Reservoir from the two upstream watersheds, which include the North, Middle, and South forks of the American River. Inflows into Folsom Reservoir shows seasonal variability, as the inflows of December to May can be larger than 4 times the inflow during the drier months of June to November. The historical average for unimpaired inflows is 2.8 million acre feet (MAF), but this average varies annually from 0.3 to 6.4 MAF (NMFS 2009). In water year 2017, the unimpaired inflow was 7.39 MAF (DWR 2018a).

Unimpaired flow into Folsom Reservoir determines and triggers water diversion limitations as stipulated in the WFA. The record of distribution of these WFA water year types portrays the historic probability of occurrence of various hydrologic years. This is shown in **Table 2-12**.

Table 2-12. WFA Water Year Types and Occurrence (1901–2017)

Water Year Type	Unimpaired Inflow into Folsom Reservoir, March–November (TAF)	Occurrence Frequency, 1901–2010
Wet	Greater than 1,600	70 out of 117 years (60%)
Average	Greater than 950 and less than 1,600	29 out of 117 years (25%)
Drier	Greater than 400 and less than 950	15 out of 117 years (13%)
Driest (i.e., conference years)	Less than 400	3 out of 117 years (2%)

Data Source: Sacramento Groundwater Authority [SGA] State of the Basin Report, 2004; SGA Basin Management Report 2006–2007, 2008a; SGA Basin Management Report, 2011; SGA Staff, pers. comm. March 16, 2018

Key:
TAF = thousand acre-feet
WFA = Water Forum Agreement

Using Nimbus Dam immediately downstream from Folsom Dam, Reclamation controls power-generating releases from Folsom Dam into suitable river flow releases. Seasonally, flows during the months of January to May or June can be larger than 3 times the flows during the months of July to December. **Figure 2-23** shows the average monthly flows at the Fair Oaks USGS gage. Average annual flows can also vary from less than 1,000 cfs to more than 8,000 cfs.

Data Source: USGS 11446500 gage at Fair Oaks 10/1955-10/2017
Key: cfs = cubic feet per second

Figure 2-23. Average Monthly Flows at Fair Oaks USGS Gage

Folsom Dam and Nimbus Dam have modified seasonal flow and water temperature in the lower American River. To improve the environmental conditions for aquatic resources in the lower American River, the WFA developed the Lower American River Flow Management Standard (FMS). The FMS is designed to allocate flow releases from Folsom and Nimbus dams in consideration of variable hydrology and coldwater pool availability in Folsom Reservoir. The FMS includes minimum flow requirements and temperature objectives to meet fishery needs throughout the entire water year. These requirements include minimum flow requirements measured downstream from Nimbus Dam, and downstream flow requirements measured between Nimbus Dam and the mouth of the lower American River. The minimum flow requirements vary from 800 to 2,000 cfs throughout the year in response to the hydrology of the Sacramento and American river basins. Adjustments are made in response to specific conditions related to the need for spawning flow progressions, fish protection, and reservoir water conservation (Northern California Water Association 2011). Implementation of the FMS has been an ongoing collaboration effort with Reclamation, who ultimately controls dam releases.

In contrast to the lower American River, the Dry Creek, Arcade Creek, and Steelhead Creek system consists of smaller, local subwatersheds. Flows in these creeks originate as precipitation, and flows are heavily influenced by local water uses, drainage, and wastewater discharges.

Dry Creek, a 17.6-mile-long stream, (4.1 in **Figure 2-18**) receives urban runoff, open space drainage, high-quality water from PCWA canals, and wastewater effluent from WWTPs. City of Roseville (Roseville) also provides raw surface water to Linda Creek to sustain the natural flow for environmental purposes. There is a strong seasonal flow pattern with high flows exceeding 1,000 cfs during the wet season and low flows generally in the range of 10 to 20 cfs during the dry season. During the dry season, effluent flows can

exceed the flow in the creek upstream from the WWTPs. Dry Creek has numerous local tributaries and is the largest tributary to Steelhead Creek.

Arcade Creek (4.2 in **Figure 2-18**) is a smaller tributary to Steelhead Creek. This subwatershed is highly urbanized with high flows in the wet season exceeding 100 cfs and low flows in the dry season often dropping below 1 cfs.

Steelhead Creek, or the Natomas East Main Drainage Canal (4.3 in **Figure 2-18**), drains both the Dry and Arcade creek flows into the Sacramento River. RD 1000 and the City of Sacramento also pump drainage water into Steelhead Creek during storm events. These pumps contribute as low as 1 percent of flow in Steelhead Creek during the dry season but as high as 52 percent during storm events. These floodwaters are at times the largest contributors of flow influencing the highly variable hydrology of Steelhead Creek (American Basin Council of Watersheds 2008).

Lower American Watershed: Water Quality

The lower American River and Folsom Reservoir water is generally characterized as high-quality surface water that is low in alkalinity, low in disinfection byproduct precursor materials, low in mineral content, and low in organic contamination. Limited data also indicate that the source of water is low in microbial contamination from giardia and cryptosporidium. Turbidity levels tend to be higher in the winter than summer because of higher flows associated with winter storms. However, mercury resulting from historical mining activities is of concern in Folsom Reservoir and the American River downstream. PCBs and "unknown toxicity" from unknown sources also limit water quality and appear in EPA's 303(d) listing.

American River and Folsom Reservoir water quality satisfies all the current federal regulations for raw and treated water. It is considered sufficient for water contact recreation, municipal and domestic uses, and coldwater and warmwater fish habitat (State Water Board 2010, CVRWQCB 2009). Intakes on Folsom Reservoir include Folsom WTP, Roseville WTP, and San Juan Water District's (SJWD) Peterson WTP. Intakes along the lower American River include Golden State Water Company's (GSWC) Coloma and Pyrites WTP, Carmichael Water District's (CWD) Bajamont WTP, and City of Sacramento's Fairbairn WTP.

Water quality in the smaller Dry, Arcade, and Steelhead creeks varies seasonally and with flow. Dry Creek is impaired with indicator bacteria (State Water Board 2017). Arcade Creek is impaired with the pesticides chlorpyrifos, diazinon, malathion, and pyrethroids from a combination of sources that include agricultural runoff, urban runoff, and aerial deposition. Copper and sediment toxicity from unknown sources also limit water quality in Arcade Creek. Steelhead Creek upstream from the confluence with Arcade Creek is

impaired by PCBs from agricultural runoff, urban runoff, and industrial sources. Impairment downstream from Arcade Creek is caused by diazinon, mercury, and PCBs, also from a multitude of sources.

Lower American Watershed: Habitat and Species

The majority of the lower American River is paralleled by the American River Parkway, preserving the surrounding riparian zone. The river channel does not migrate to a large degree because of levees, upstream dams, and incision of the river deep into sediments. The banks of the lower American River channel provide riparian habitat—both scrub and forest consisting of cottonwood, valley oak, and willow, with occasional white alder, box elder, and Oregon ash. Understory species include wild grape, wild rose, blackberry, and elderberry. Emergent marsh habitat is found in still or slow-moving shallow water located on the edges of the river and on the banks of open water areas. These marshes are dominated by aquatic vegetation such as cattail, tule, soft rush, and blue vervain. Wildlife frequently spotted along the river include great blue heron, egret, mallards and other waterfowl, western rattlesnake, gray squirrel, river otter, beaver, turkey, mule deer, coyote, and mountain lion (Sacramento River Watershed Program 2010).

Invasive species, however, are rapidly expanding into the riparian vegetation along the lower American River. In particular, red sesbania is expanding along shorelines of streams and ponds. Pepperweed occupies extensive areas of abandoned agricultural fields with relatively moist soils and subject to periodic flooding in the first 3 miles of the American River upstream from the Sacramento River confluence. Chinese tallow tree, another recent invader, is also expanding in riparian habitats, as are longer established invaders such as arundo, Pampas grass, Spanish broom, French broom, Himalayan blackberry, and tamarisk, which can rapidly colonize exposed bar surfaces and stream banks.

Flows and water temperatures in the lower American River have been altered by the construction of Folsom and Nimbus dams. The dams also pose barriers to migratory fish and have eliminated gravel inputs to the lower river. Nonetheless, the lower American River is generally cold and clear, providing habitat for anadromous and resident fish species. The river is typically low gradient, contains gravel bars, and is composed of riffle, run, glide, and pool habitats (Reclamation 2011a).

The lower American River supports rich fish diversity, but the abundance of some individual species appears to be low. Of the 43 river species, 19 are considered numerous or common in certain portions of the lower American River, 9 are considered present or occasional, 14 are considered as few, uncommon, or rare, and 1 is now extinct. Twenty-two are believed to be non-anadromous species native to the lower American River. In addition to Chinook salmon and steelhead, a few native species have been abundant in surveys conducted in recent years, including Sacramento sucker, Sacramento pikeminnow, sculpins (prickly and riffle), tule perch, hardhead, and Pacific lamprey. Some nonnative species, such as striped bass,

American shad, and smallmouth and largemouth bass occur in abundance and are an important recreational resource for anglers (Sacramento County 2008).

Several species of fish in the lower American River are of primary concern because of their declining numbers, and/or their importance to recreational/commercial fisheries. These include Chinook salmon, steelhead, Sacramento splittail, nonnative striped bass, and nonnative American shad. Management of the river to improve in-stream habitat and enhance these fisheries is a goal of many stakeholders, agencies, and organizations in the Sacramento region. These five species are described in further detail in **Table 2-13**.

Table 2-13. Species of Concern on Lower American River

Fish	Abundance in Lower American River Watershed
Chinook Salmon	The lower American River historically supported spring- and fall-run Chinook salmon. By 1955, it is believed that American River spring-run Chinook salmon were extinct due to dam construction. Since that time, fall-run Chinook salmon have been the dominant run. Due to concerns over population size and hatchery influence, Central Valley fall and late-fall-run Chinook Salmon are Species of Concern under the federal Endangered Species Act. Central Valley spring-run Chinook Salmon were listed as threatened under both the state and federal endangered species acts in 1999.
Steelhead	The lower American River originally supported summer-, fall-, and winter-run steelhead. Historically, nearly all steelhead spawning occurred upstream from what is now the Nimbus Dam. By 1955, with the completion of Nimbus and Folsom dams, it was believed that summer-run steelhead were extinct from the American River. However, unsubstantiated reports from anglers indicate that remnant populations of summer-run steelhead may still exist in the river. Remnant populations of the fall-run and winter-run steelhead do still exist in the river. Central Valley steelhead are listed as threatened under the federal Endangered Species Act, and their Evolutionarily Significant Unit encompasses the lower American River.
Sacramento Splittail	Historically, splittail inhabited Central Valley lowland rivers and lakes. Presently, adult splittail primarily inhabit the Delta, Suisun Bay, Suisun Marsh, and other parts of the Sacramento-San Joaquin Estuary. Splittail are also known to inhabit the Sacramento River below the Red Bluff Diversion Dam and the lower sections of its tributaries, including the Feather and American rivers. Little information regarding Sacramento splittail occurrence, abundance, or habitat use is available specifically for the lower American River. The Sacramento Splittail are not listed under the state or federal endangered species acts, but are a concerned a species of concern in the lower American River due to their importance to recreational and commercial fisheries.
American Shad	American shad, a nonnative species, were first introduced into California in 1871. American shad are another anadromous species, migrating from the ocean to freshwater to spawn. The introduced American shad rapidly became abundant, and by 1879 a commercial fishery had developed in California. Legislative action in 1957 terminated the commercial fishery in favor of a rapidly developing sport fishery. No specific estimates are available regarding the annual run size of American shad in the lower American River. American shad are not listed under the state or federal endangered species acts, but are a concerned a species of concern in the lower American River due to their importance to recreational and commercial fisheries.

Table 2-13. Species of Concern on Lower American River (contd.)

Fish	Abundance in Lower American River Watershed
Striped Bass	Striped bass were introduced into California in 1879 and 1882, when shipments were released in the Sacramento-San Joaquin Estuary. The species rapidly became abundant and provided the basis for a commercial fishery by 1888. Striped bass remain an important sport fish with high recreational value. However, studies suggest that striped bass may be contributing to the decline of native fish species in the Central Valley. Additional research is needed determine the impact of striped bass to native fish in the lower American River. Limited information is available on striped bass presence and distribution in the lower American River, based on previous surveys conducted by the USFWS. Striped Bass are not listed under the state or federal endangered species acts, but are a concerned a species of concern in the lower American River due to their importance to recreational and commercial fisheries.

Source: American River Parkway Plan (Sacramento County 2008), NOAA 2018, USFWS 2018,
Key:
NOAA = National Oceanic and Atmospheric Administration
USFWS = U.S. Fish and Wildlife Service

Portions of the Dry, Arcade, and Steelhead creek system have been channelized and lack ecosystem values. However, the Dry Creek system has fairly well-connected riparian corridors, relatively low erosion, and fair salmonid (i.e., Chinook salmon, Central Valley steelhead, and resident rainbow trout) habitat. Chinook salmon and steelhead trout no longer spawn in upper tributaries of Dry Creek, although some spawning still occurs in the Dry Creek mainstem. Some Dry Creek tributaries may be used for spawning and shelter for salmonids as well, although spawning salmonids have not been observed in Clover Valley Creek, Antelope Creek, or Sucker Ravine (Placer County 2004).

Lower American Watershed: Watershed Management and Stewardship

Watershed management of the lower American River was one of the central concerns of the WFA that was signed in 2000. The need to balance both environmental and water supply needs off the American River initiated the 7-year-long regional Water Forum effort. The resulting integration and coordination have continued and expanded, and this 2018 ARB IRWMP Update is closely related to implementation actions of the WFA.

The lower American River has also been designated a "Recreational River" under both the California Wild and Scenic Rivers Act and the National Wild and Scenic Rivers Act. These designations provide state and national recognition, and additional protection of the river's outstanding scenic, wildlife, historic, cultural, and recreational values. Organizations, such as the Sacramento Area Creeks Council and the American River Parkway Foundation support protection of the lower American River and its recreational values. Sacramento County has designated 4,600 acres along the river as a regional park, and its 23-mile trail system of the American River Parkway has been designated a "National Recreational Trail." Folsom Reservoir is similarly surrounded by the Folsom Lake State Recreation Area, providing both recreation and habitat protection. These parks and recreational areas draw millions of local visitors each year.

Some local tributaries to the lower American River have notable, active water management plans. One is the Alder Creek Watershed Management Action Plan, developed by City of Folsom (Folsom). The 15-mile-long Alder Creek flows from the Sierra Nevada foothills west to Lake Natoma on the lower American River. Located in a place of anticipated urban development, the plan included a watershed assessment to characterize natural resource conditions as well as education and outreach to encourage watershed stewardship. With assistance from CALFED funding, Folsom developed Alder Creek management recommendations and implementation strategies in a collaborative manner (Folsom 2010).

Placer and Sacramento counties both manage the Dry, Arcade, and Steelhead creek system. The two counties jointly developed a 2003 Dry Creek Watershed Resource Management Plan, and Dry Creek is included in many of Placer County's conservation programs, such as Placer Legacy. The Dry Creek Conservancy, a nonprofit organization, also aims to facilitate watershed conservation, restoration, and education in Dry Creek, as well as in other Placer County creeks. The ABCW has been active in these creeks as well, conducting a 2008 Steelhead Creek Drinking Water Quality Study and Watershed Assessment (American Basin Council of Watersheds 2008). Recreation also plays a role in watershed stewardship, as Sacramento County manages a 6-mile corridor known as the Dry Creek Parkway. Regional plans aim to eventually create a 70-mile greenway loop in this Region.

2.6.2.5. Lower Sacramento Watershed

The Lower Sacramento Watershed lies mostly to the west and outside of the Region, but its 200 square miles in the Region includes most of the urban and developed areas adjacent to the river. Cities in this watershed include Sacramento, Rancho Cordova, and Elk Grove. The Lower Sacramento Watershed is primarily urban. The suburbs, such as Elk Grove, have been rapidly developing and expanding in the past few decades, creating water supply-, environmental-, and flood-related interests in this watershed.

The Morrison Creek Stream Group (**Figure 2-18**) carries flows from the Lower Sacramento Watershed within the Region and is the focus of the description of this subsection. Of the Morrison Creek tributaries, information for Laguna Creek[5] is more available, as it has been studied and is managed by Laguna Creek Watershed Council and the Upper Laguna Creek Collaborative. Characteristics of Laguna Creek are included in a general sense as a representative of the other creeks of the Morrison Creek Stream Group. The Lower Sacramento Watershed and its subwatersheds are shown in **Figure 2-24**.

[5] A tributary of the Cosumnes River is also named Laguna Creek, not to be confused with this one of the Morrison Creek Stream Group.

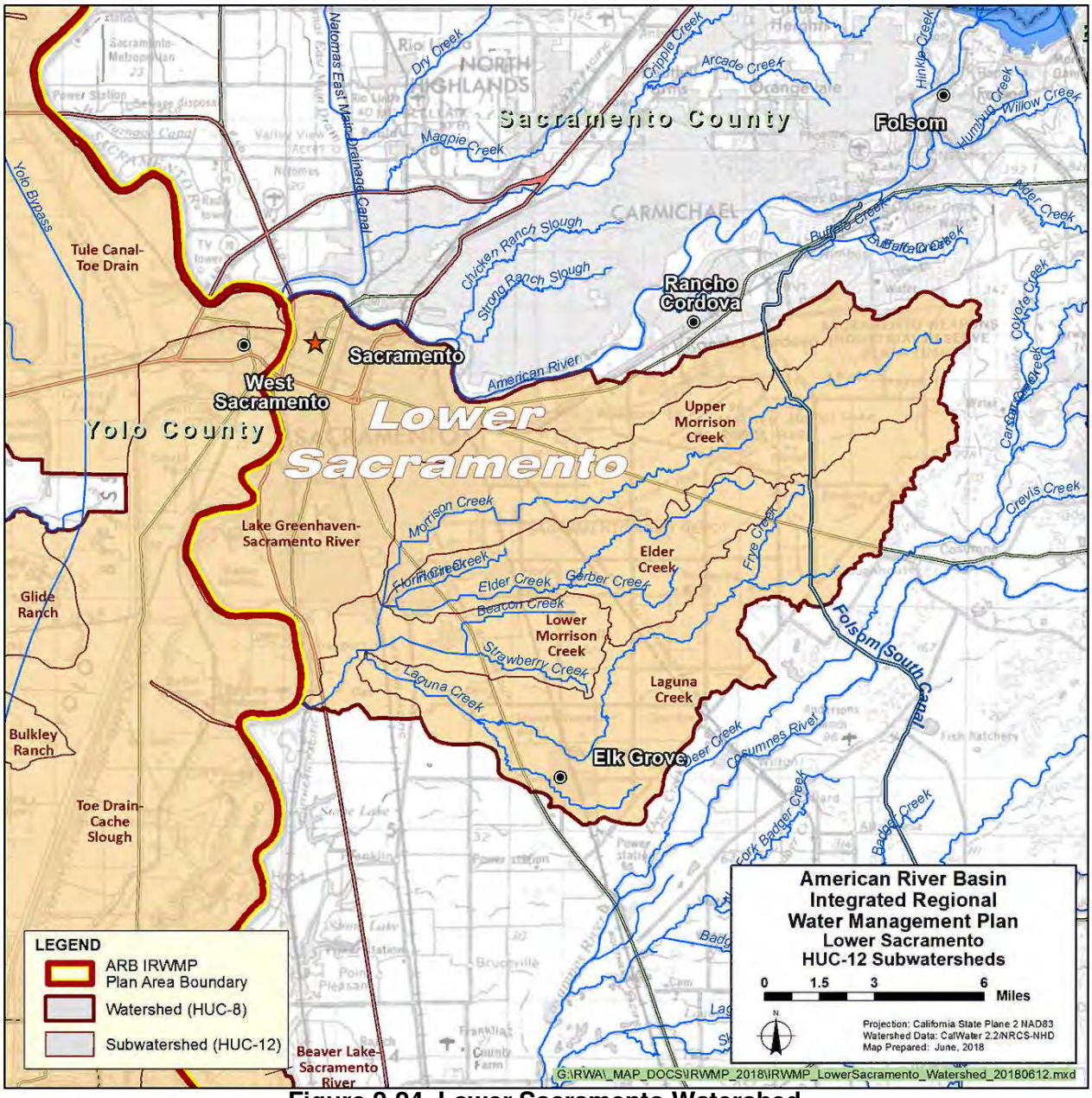


Figure 2-24. Lower Sacramento Watershed

Lower Sacramento Watershed: Hydrology

The Morrison Creek Stream Group is a tributary to the Sacramento River, and includes Morrison, Florin, Elder, Union House (Beacon), Strawberry, Laguna, and Elk Grove creeks (see **Figure 2-24**). Laguna Creek and its many tributaries, such as Elk Grove Creek, join Morrison Creek north of the SRWWTP. These streams are small, local streams that have been extensively relocated and channelized as a result of urban development. Laguna Creek, for example, is a meandering single channel that conveys runoff from an average of 16 to 17 inches of rain that falls over this small watershed. Urbanization has increased peak flows and associated erosion, habitat degradation, and flood concerns.

The Morrison Creek Stream Group flows into Stone Lakes National Wildlife Refuge west of Elk Grove, south of the FRWP intake facility. During winter months, high flows may also be directed to the Stone Lakes National Wildlife Refuge, located in the Upper Mokelumne Watershed, described in **Section 2.6.2.7** (Elk Grove 2008).

Lower Sacramento Watershed: Water Quality

Many creeks of the Morrison Creek nStream Group have TMDLs for the pesticide diazinon. EPA's 303(d) list also identifies sediment toxicity, polychlorinated biphenyl, and pyrethroids from unknown sources. Assuming Laguna Creek is representative of the Morrison Creek Stream Group, additional water quality concerns potentially include fecal coliform (*E. coli*) concentrations, dissolved oxygen, trace metals, and excess nutrients (Geosyntec Consultants 2007).

Lower Sacramento Watershed: Habitat and Species

As discussed, the streams of the Morrison Creek Stream Group have been extensively relocated and channelized as a result of urban development. These streams were first impacted by farming, starting in the late 19th century when native grasslands and sparse riparian vegetation were displaced by crops, pasture, and invasive nonnative grasses and weeds. Vernal pool grassland habitat can be found in some upstream reaches.

Laguna Creek, and potentially other nearby tributaries, support sensitive species, such as valley elderberry longhorn beetle, giant garter snake, and western pond turtle; aquatic foraging birds; American peregrine falcon; and nesting raptors, such as Swainson's hawk and white-tailed kite. There are no special-status fish species that are known to occur in Laguna Creek. Altered habitats and the presence of nonnative aquatic species are primary limiting factors impacting the native fish community (Laguna Creek Watershed Council 2009).

Lower Sacramento Watershed: Watershed Management and Stewardship

The Laguna Creek Watershed Council is a nonprofit organization established in 2008 that represents a diverse group of watershed residents, community group leaders, and local government agency representatives. The council has been active in watershed management and stewardship for Laguna Creek, within the Morrison Creek Stream Group. However, similar agencies and efforts for other streams in the Morrison Creek Stream Group, as a whole, have not been identified.

2.6.2.6. Upper Cosumnes Watershed

The Upper Cosumnes Watershed covers 335 square miles of the southeastern portion of the Region. The watershed in the Region is primarily agricultural, including croplands, vineyards, pastures, and orchards.

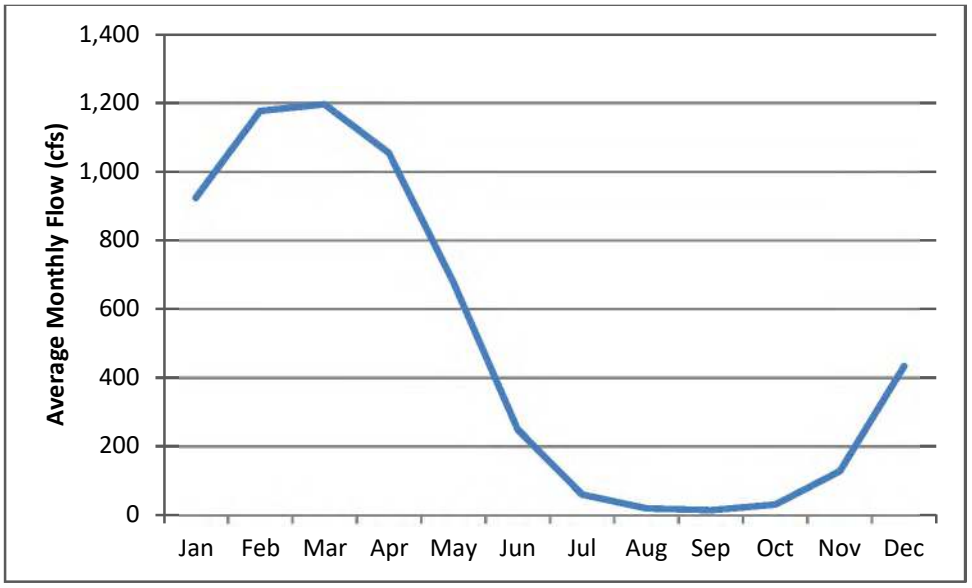
This area supports smaller communities, such as the Galt and Rancho Murieta Community Services District (Rancho Murieta), and residential areas have developed in recent years. Deer Creek and Laguna Creek (see **Figures 2-18** and **2-25**) are the main tributaries to the lower portion of the Cosumnes River that flows within the Region. The Upper Cosumnes Watershed is considered to have a high potential for effective restoration, and it is the largest, undammed (i.e., no large, permanent dams) river remaining in the Sierras. Its downstream end is also a part of the Delta and is influenced by tidal effects. Thus, there are also strong environmental interests in this watershed. Unlike the other watersheds, the Upper Cosumnes Watershed has been studied as a whole by the Cosumnes River Preserve (CRP) and is generally presented as such in this subsection description.

Figure 2-25. Upper Cosumnes Watershed

Upper Cosumnes Watershed: Hydrology

Flowing through the southern portion of the Region, the Cosumnes River is a tributary to the Mokelumne River and is a part of the larger San Joaquin River Hydrologic Region. The 80-mile-long Cosumnes River is a small river with headwaters beginning at about at 7,200 feet above sea level in the Sierra Nevada. The river flows southwest to the Delta. The segment of the watershed in the Region is characterized as tidal floodplain or open floodplain. The tide influences multiple shifting channels in the tidal floodplain areas, while the open (non-tidal) floodplain portion is not influenced by tides (CRP 2008).

Most of the flow in the Cosumnes River and its tributaries results from winter rain, and the annual hydrograph closely follows the pattern of precipitation. The river is considered to be undammed because it has no major hydroelectric dams. Extreme low flows (including dry bed) occur in the lower Cosumnes River in the late summer, after long periods without precipitation. Average annual flows can also vary from around 36 cfs to more than 1,500 cfs. **Figure 2-26** shows the average monthly flows for the Cosumnes River.



Data Source: USGS 11335000 gage at Michigan Bar 10/1907-03/2017
Key: cfs = cubic feet per second

Figure 2-26. Average Monthly Flows at Michigan Bar

There are no required in-stream flows for aquatic resources maintenance for the Cosumnes River. The USFWS is working to determine and evaluate these requirements that will ensure adequate flows for all life stages for all salmonids (USFWS 2013).

Upper Cosumnes Watershed: Water Quality

Water quality of the Cosumnes River is impacted by levels of nitrogen, phosphorous, and suspended sediments, from both point and nonpoint sources. Water temperature, conductivity, and pH generally increase downstream (CRP 2006). EPA's 303(d) list identifies *E. coli*, sediment toxicity, and invasive species as impairments to the Cosumnes River system. Since 2011, the CVRWQCB has implemented a Delta-wide mercury TMDL, and this plan identifies the entire Cosumnes River Watershed as a high mercury contributor (CVRWQCB 2010).

Despite contamination concerns, water quality is sufficient for water contact recreation and municipal use after treatment. Rancho Murieta Community Services District takes water from the Cosumnes River at Granlees Dam for municipal use. Other uses are primarily agricultural for private irrigators along the river.

Upper Cosumnes Watershed: Habitat and Species

The Upper Cosumnes Watershed's lower reaches in the Region support one of the biologically richest regions in California's Central Valley. Stretches of the river are relatively unaffected by development, with sloughs, ponds, oak woods, and fertile bottomlands. Marshes and grasslands provide wintering grounds for tens of thousands of migrating birds, songbirds and raptors, including sandhill crane, tundra swan, and great blue heron. The river is home to a number of resident, fall-run native fishes, and Chinook salmon are showing signs of rebounding after years of decline. Located between Sacramento and Stockton, there is increasing pressure for urban development in the watershed. Farmland conservation is considered to be important in the coming years, as it provides habitat for wildlife and helps buffer important streamside areas from the effects of urbanization.

Upper Cosumnes Watershed: Watershed Management and Stewardship

The CRP plays an integral part in watershed management and stewardship in the Upper Cosumnes Watershed. CRP is currently a multiagency partnership, including the federal, state, and local governments, nonprofit organizations, and local school districts. Cooperative management agreement partners include:

- U.S. Bureau of Land Management
- The Nature Conservancy (TNC)
- Sacramento County Department of Regional Parks
- CDFW
- Ducks Unlimited, Inc.
- DWR
- California State Lands Commission
- NRCS
- Galt Joint Union Elementary School District

The partnership has studied and developed watershed assessment plans and CRP Management Plans. The CRP has also encouraged recreation and over 60,000 people visit each year. More information about the CRP is available on its Web site at http://www.cosumnes.org/.

TNC and local farmers started a 1,040-acre organic farm on the CRP in 1995. By the year 2000, TNC had protected more than 20,000 acres of private farmland and rangeland in the watershed through conservation easements, and 10,000 acres more through direct purchase. The preserve has continued to grow and it now encompasses more than 46,000 acres. The CRP is reestablishing riparian forest and perennial grasslands through active and passive restoration efforts. Valley oak, Oregon ash, Fremont's cottonwood, box elder, willow, wild rose, and elderberry are planted to create the diverse understory of trees and shrubs found in mature riparian forest (NMFS 2009).

2.6.2.7. Upper Mokelumne Watershed

The Upper Mokelumne Watershed is located in portions of Sacramento, San Joaquin, Amador, and Calaveras counties and encompasses some 1,266 square miles. Only a small portion of the Upper Mokelumne (104 square miles) is in the Region. Most of the significant hydrologic, habitat, and watershed management of the Upper Mokelumne occurs south of the Region, so it is not described further here. The portion of the Upper Mokelumne Watershed within the Region consists of minor drainages from primarily human-made inland Delta waterways. The Upper Mokelumne Watershed and its subwatersheds are shown in **Figure 2-27**.

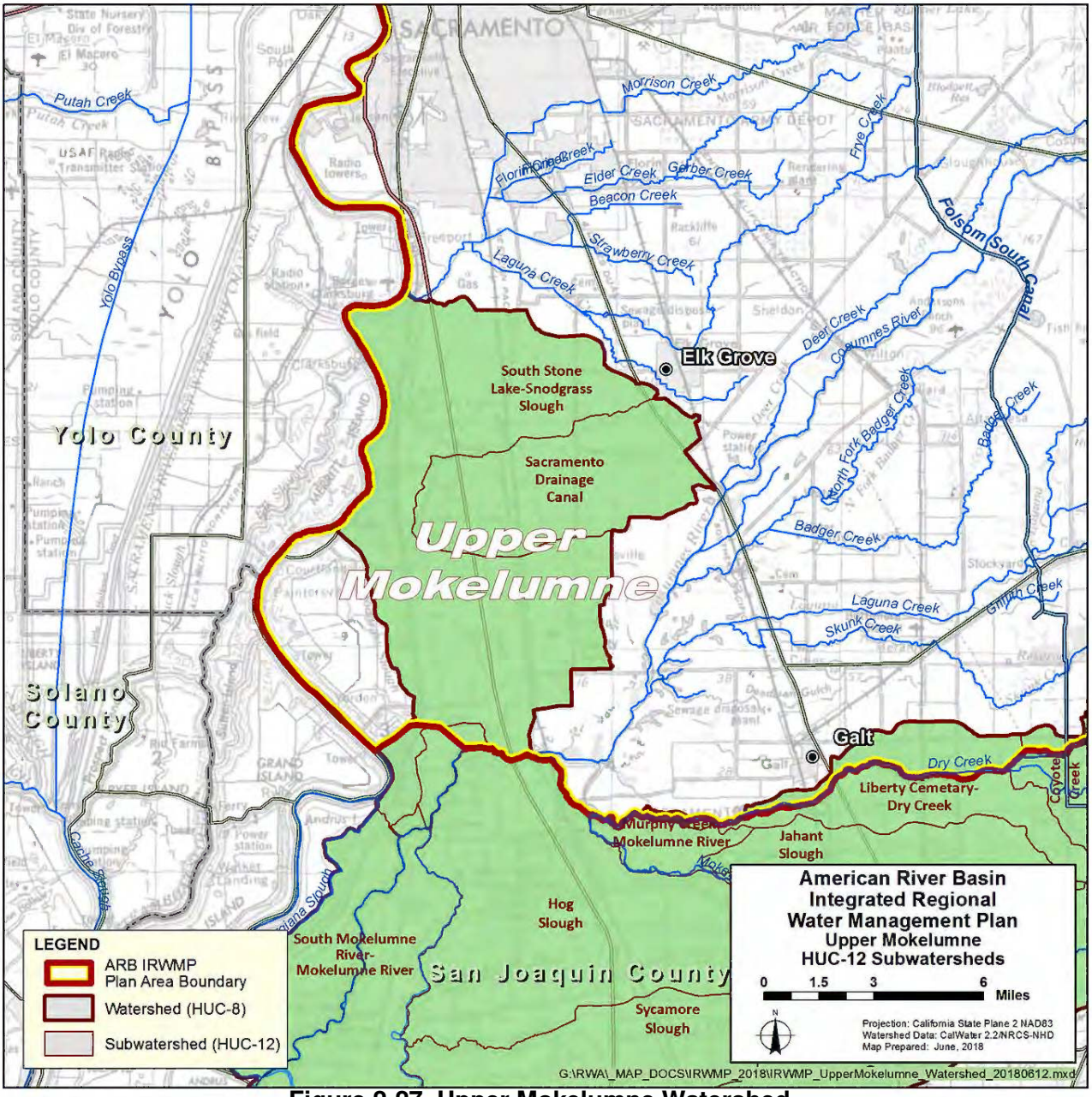


Figure 2-27. Upper Mokelumne Watershed

Upper Mokelumne Watershed: Hydrology

The primary hydrologic feature of the Upper Mokelumne is the lower Mokelumne River, which constitutes a few miles of the Region southwestern boundary. The lower Mokelumne is dammed about 34 miles upstream by the Camanche Dam and Reservoir operated by EBMUD. The operation of Camanche Dam and Pardee Dam further upriver have significantly modified the downstream flow regime.

Upper Mokelumne Watershed: Water Quality

Water quality has been characterized in the Mokelumne River for the portion of the Upper Mokelumne Watershed that is in the Region. While water quality is considered good for most purposes, there are constituents that exceed protective water quality standards, causing the lower Mokelumne River to be placed on the State Water Board's 303(d) listing of impaired water bodies. These pollutants include: chlorpyrifos associated with agricultural runoff; dissolved oxygen from unknown sources; and copper, mercury, unknown toxicity from unknown sources, and zinc associated with mining in the upper portions of the watershed.

Upper Mokelumne Watershed: Habitat and Species

The Upper Mokelumne Watershed in the Region is dominated by cropland, grassland, and wetland. In a 2009 report the NMFS evaluated the Mokelumne River for its habitat potential to support salmon and steelhead (NMFS 2009). The report concluded that the lower river segment does have a low potential to support viable self-sustained populations of steelhead. Issues include reduced flows in this reach of the river from damming and diversions, impediments to passage, relatively high water temperatures, lack of spawning gravels, and water quality concerns.

Another noteworthy habitat in the Region of the Upper Mokelumne Watershed is the Stone Lakes National Wildlife Refuge. The refuge is part of the National Wildlife Refuge System and is a major stop along the Pacific Flyway for migrating birds. The refuge is authorized for up to 18,000 acres and is part of a partnership of the USFWS and more than two dozen other partners (see http://www.fws.gov/refuge/Stone_Lakes/). The refuge is home to more than 200 species of birds and many other fish and wildlife species.

Upper Mokelumne Watershed: Watershed Management and Stewardship

As described, the USFWS and more than two dozen partners are actively engaged in the Stone Lakes National Wildlife Refuge. USFWS adopted a Comprehensive Conservation Plan for the refuge in 2007 that provides a 15-year management direction (see http://www.fws.gov/refuge/Stone_Lakes/what_we_do/planning.html).

2.6.3. Groundwater: Groundwater Basin Characteristics

Groundwater is an important source of water supply in the Region and is an integral part of the regional water resources setting. Groundwater supports a significant portion of the Region’s water needs, and often

helps reduce impacts to water users in times of shortage. Efforts to increase conjunctive use[6] in the Region have increased the use of surface water when available during wet and normal conditions, while preserving and protecting groundwater resources for dry and critically dry periods.

2.6.3.1. Hydrogeology of the Region

There are three groundwater subbasins defined by DWR that underlie the Region, as shown in **Figure 2-3**: the North American, South American, and Cosumnes groundwater subbasins. These subbasins are bounded by the Sacramento or Feather River to the west and the geologic formations of the Sierra Nevada to the east. The North American Subbasin boundaries are defined by the Bear and American rivers, the South American Subbasin by the American and Cosumnes rivers, and the Cosumnes Subbasin by the Cosumnes and Mokelumne rivers. These subbasins are discussed separately in the following subsections after an initial characterization of the hydrogeology, water quality, and contamination issues that span across the entire Region. Each subbasin has one or more entities that manage groundwater. Groundwater extraction in the Region is discussed in **Section 2.9**.

Groundwater resources in Sacramento County and most of the Region have been extensively investigated and reported in DWR's Bulletin 118, California's Groundwater. The Bulletin's 2003 update describes various geologic formations that constitute the water-bearing deposits underlying Sacramento County and significant portions of western Placer County. Located in the Sierra Nevada foothills and mountain areas, El Dorado County does not generally have significant groundwater resources from a municipal supply standpoint. Groundwater-bearing formations in the Region include an upper aquifer system consisting of the Riverbank, Turlock Lake, and Laguna formations, and a lower aquifer system consisting primarily of the Mehrten Formation. The formations are shown in **Figure 2-28** and are typically composed of lenses of interbedded sand, silt, and clay, interlaced with coarse-grained stream channel deposits. **Figure 2-28** illustrates that these deposits form a wedge that generally thickens from east to west to a maximum thickness of about 2,500 feet under the Sacramento River.

Groundwater occurs in an unconfined to semi-confined state throughout the Region. Semi-confinement may occur in local areas, and the degree of confinement typically increases with depth. Groundwater in the Riverbank, Turlock Lake, and Laguna formations is typically unconfined. The deeper Mehrten Formation, a major source of groundwater, exhibits semi-confined conditions. The Valley Springs and Ione formations

[6] As defined by the 2009 California Water Plan Update, conjunctive use (management) is the "…coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies in a region…" (DWR). Conjunctive use involves using and storing surface water to intentionally recharge groundwater during wet years. Stored groundwater can then be used during drier years. Conjunctive use is an integral part of the WFA and requires actions such as regional cooperation, groundwater management, construction of new wells, and operational changes in water use depending on hydrologic year type.

underlie some of the productive aquifers in the Region and are transitional aquifer systems that contain a mixture of saline and fresh groundwater (SGA 2008b).

Groundwater in the Region moves from sources of recharge to areas of discharge. Most recharge to the local aquifer system occurs along active stream channels where extensive sand and gravel deposits exist. As a result, the highest groundwater elevations occur near the American and Sacramento rivers.

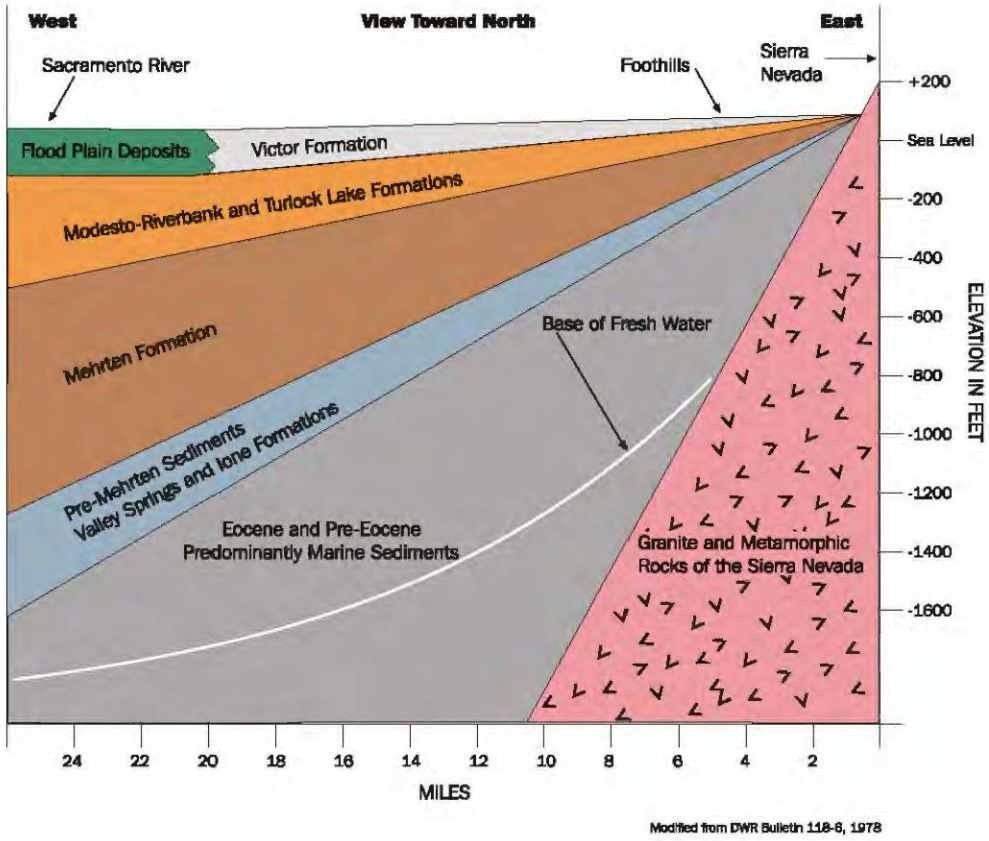


Figure 2-28. Regional Geologic Cross Section

2.6.3.2. Groundwater Quality in the Region

Water quality analyses of the aquifers underlying the Region have shown that groundwater found in the upper aquifer system is generally of higher quality than that found in the lower aquifer system. Water from the upper aquifer (specifically the Laguna Formation) generally does not require treatment (unless high arsenic levels are encountered), other than disinfection for public drinking water systems. In contrast, the lower aquifer system (specifically the Mehrten Formation) generally contains higher concentrations of iron and manganese. The lower aquifer system also has higher concentrations of total dissolved solids (TDS), although this aquifer also typically meets water quality standards as a potable water source. At depths of approximately 1,400 feet or greater (actual depth varies throughout the basin, but could be as shallow as 800 feet), TDS concentrations exceed 2,000 milligrams per liter (mg/L); thus, the groundwater is considered

nonpotable (SCGA 2006). The area underlying the upper and lower aquifers (below the Mehrten Formation) is saline connate water (trapped in rock pores and often pressurized), at depths ranging from 800 feet in the east to 2,000 feet below ground surface in the west.

While the Region enjoys robust groundwater resources, contamination has and continues to be a significant management concern. There are numerous groundwater contamination plumes in the Region stemming from previous industrial activities that have directly impacted or continue to threaten groundwater quality. Throughout the Region, groundwater contamination plumes have forced some wells to be taken out of service in the past two decades, and continue to threaten other local groundwater supplies. For example, wells owned by California American Water (Cal-Am), GSWC, and SCWA have been impacted and shut down due to the migration of contaminants from Aerojet General Corporation (Aerojet), while wells in Sacramento Suburban Water District (SSWD) have been abandoned due to the McClellan plume from the former air force base (AFB). Contaminant plumes from Aerojet have migrated north, beneath the American River, impacting wells in CWD and Fair Oaks Water District (FOWD). The Aerojet and McClellan AFB locations are the largest, most extensive groundwater contamination plumes in the Region. The approximate location and extent of these plumes and others, such as the plumes from Mather AFB and the Union Pacific Railroad sites as of 2008, are shown in **Figure 2-29**. Some of the main contaminants of concern include trichloroethene, tetrachlorethene (PCE), perchlorate, and n-nitrosodimethylamine (NDMA).

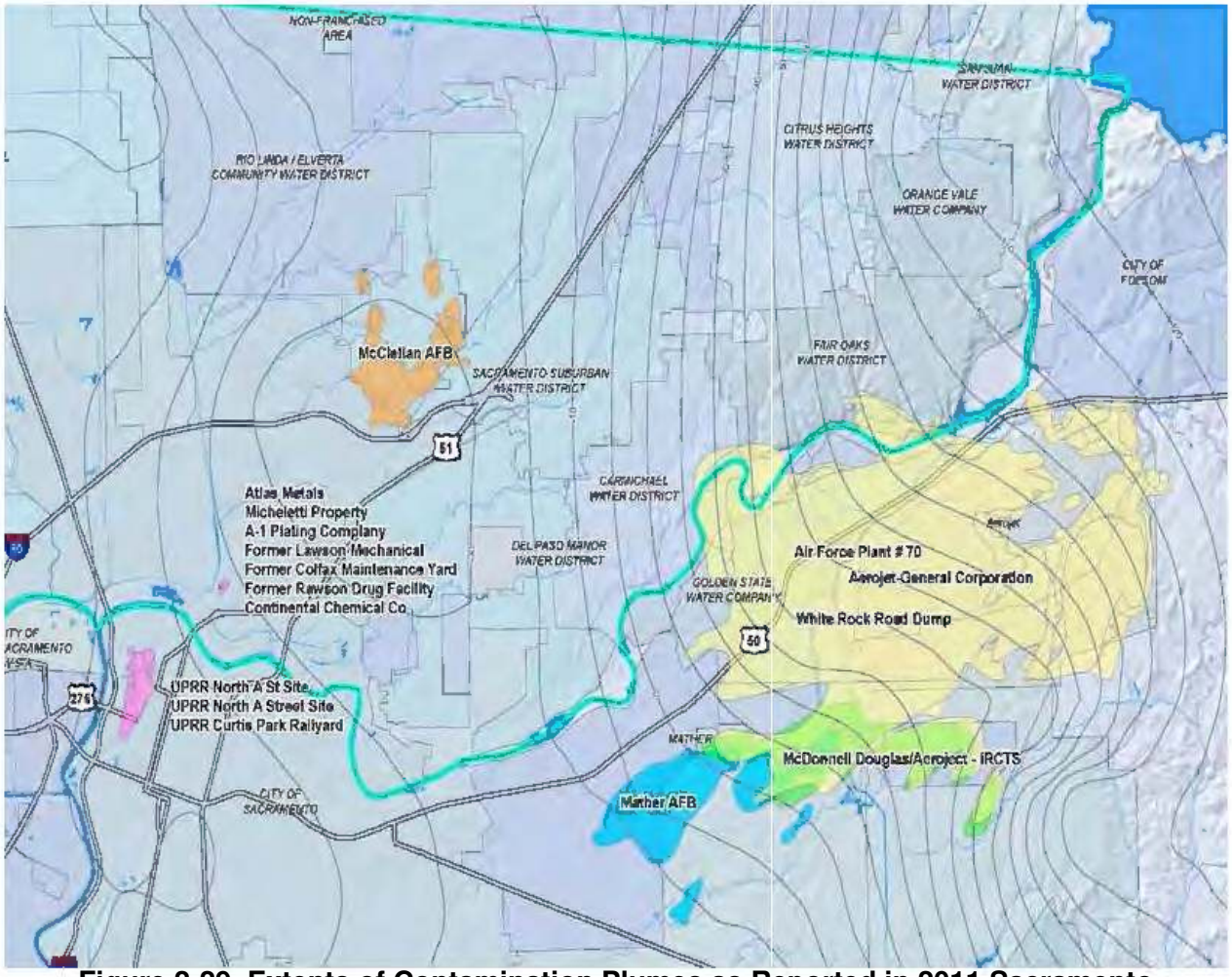


Figure 2-29. Extents of Contamination Plumes as Reported in 2011 Sacramento Groundwater Authority Basin Management Report

Monitoring wells and pump-and-treat facilities have been installed in numerous locations to control further contaminant plume migration and to remediate soil and groundwater resources. The Sacramento Environmental Management Department maintains a policy of special review by appropriate regulatory agencies for well permits within 2,000 feet of a known contaminant plume (referred to as Consultation Zones) and prohibits drilling of new public water supply wells at the former McClellan AFB to ensure public safety. In response to concerns over these contaminant plumes, the Region began a Regional Contamination Issues Committee that has met on a quarterly basis since 2004. The committee coordinates the region's water suppliers with regulators and responsible parties to most effectively ensure cleanup of these contaminants in a timely fashion.

Other than the aforementioned contaminant plumes, groundwater from both the upper and lower aquifers is used extensively for various beneficial uses, and the groundwater quality generally meets all state and federal maximum contaminant level (MCL) standards for drinking water. From north to south in the Region,

groundwater quality has been most recently assessed by the Western Placer County Groundwater Management Plan Group (WPC) in 2017, by Sacramento Groundwater Authority (SGA) in 2016, and by Sacramento Central Groundwater Authority (SCGA) in 2016. Little formal assessment of groundwater quality conditions has been performed in the sparsely populated portion of the Region south of the Cosumnes River. However, there are no known contaminant plumes (SAWC 2010), and the City of Galt reported no MCL exceedences for any groundwater quality parameters in eight of its City wells in its 2016 Drinking Water Consumer Confidence Report (Galt 2017). For the remainder of the Region, extensive water quality sampling has occurred at over 200 public supply wells and dozens of monitoring wells. Typical parameters analyzed include: TDS, nitrate, arsenic, hexavalent chromium (CrVI), iron, manganese, and perchlorate. MCL exceedences for TDS, arsenic, and nitrate are rare. These parameters are discussed further below.

Total Dissolved Solids

TDS is a measure of all dissolved constituents in water, resulting primarily from the rocks and sediments with which the water comes into contact. TDS has a secondary MCL drinking water standard (associated with the aesthetics of the water) of 500 mg/L. With respect to TDS, water quality is generally very good in the Region. However, the WPC did note areas of elevated TDS in portions of Placer County that are likely associated with shallow occurrences of the Ione Formation, which was deposited in a marine environment. Of 58 wells sampled by the WPC, 11 wells exceeded the secondary MCL, but these tend to be concentrated in a relatively small area along the eastern margin of the basin. This area of high TDS is not considered a concern to the overall health of the Region's groundwater basins. In the SGA area, the average TDS was 268 mg/L, with only six out of 255 distinct wells exceeding the secondary MCL. In the SCGA area, only one well out of 56 had a secondary MCL exceedence. Agencies will continue to monitor for long-term trends in TDS concentrations to determine if concentrations are increasing through time.

Nitrate

Nitrate is a commonly naturally occurring element, but elevated concentrations are often associated with human activities such as wastewater discharge, urban runoff of applied fertilizers, and agricultural activities. The MCL for nitrate is 45 mg/L. While nitrates are somewhat elevated compared to what might be considered naturally-occurring background, nitrate concentrations are not a significant concern in the Region. The data analyzed by WPC, SGA, and SCGA included distinct samples from 493 wells. Of those, there were only two past observed concentrations exceeding the MCL. No public supply wells currently exceed the MCL. SGA calculated an average concentration of 11.5 mg/L in 252 wells. The occurrence of nitrate in the Region does not have a distinct geographic pattern, although concentrations tend to be higher in the upper aquifer as it is closer to the human activities associated with its increased concentration.

Agencies will continue to monitor for long-term trends in nitrate concentrations to determine if concentrations are increasing through time.

Arsenic

Arsenic is a naturally occurring element with an MCL of 10 mg/L. Arsenic is not seen as a major groundwater quality concern in the region. However, the western half of the Region tends to have higher concentrations of arsenic. In Placer County, WPC noted that only one well out of 58 total had an MCL exceedence for arsenic. In the SGA area, only one well of 236 distinct wells sampled had an MCL exceedence. In the SCGA area, nine out of 72 wells were noted to have an MCL exceedence. In general, water purveyors have been successful in simply avoiding these areas of relatively high arsenic. Where necessary, wellhead treatment systems are demonstrated as very effective in removing arsenic to protective levels.

Hexavalent Chromium

CrVI is a dissolved metal that is commonly found in low concentrations in groundwater. It can occur naturally, but it has also been sourced historically from industrial operations. A state MCL was established at 10 micrograms per liter (µg/L) In July 2014, but that standard was rescinded in 2017 and is currently under review. For discussion purposes, information here is presented in comparison to the suspended MCL. In Placer County, the WPC noted the presence of CrVI, but it was not widespread. Of 58 wells sampled, only one well exceeded 10 µg/L and six wells had concentrations between 5 and 10 µg/L. In the SGA, the presence of CrVI was more extensive and was concentrated in the central part of the SGA area. Of 215 distinct wells sampled, 65 wells had concentrations between 5 and 10 µg/L and 19 wells had concentrations greater than 10 µg/L. SGA noted that higher concentrations tended to be in shallower wells. In the SCGA area, none of the 134 wells sampled exceeded 10 µg/L. Many of the affected water suppliers in the SGA are planning for potential wellhead treatment systems while awaiting the review of the CrVI MCL. SGA continues to look for options to determine the potential sources of elevated CrVI in its management area.

Iron

Iron is a naturally-occurring element and is found in groundwater as a dissolved metallic ion. Iron has a secondary MCL of 300 µg/L, because it tends to have a bad taste and can precipitate as a red-brown solid on plumbing fixtures. In general, iron concentrations tend to be higher in the Region in the lower aquifer system, which is associated with the volcanic Mehrten Formation. Elevated iron was most prevalent in SGA area where 56 wells out of 196 distinct wells exceeded the MCL. Where encountered, water suppliers generally successfully use wellhead treatment to manage the iron.

Manganese

Manganese is a naturally-occurring element and is found in groundwater as a dissolved metallic ion. Manganese has a secondary MCL of 50 µg/L, because it tends to have a bad taste and can precipitate as a black solid on plumbing fixtures. In general, manganese concentrations tend to be higher in the Region in the lower aquifer system, which is associated with the volcanic Mehrten Formation. Elevated manganese is most prevalent in SGA area (35 wells out of 183 wells exceeded the MCL) and in the SCGA area (25 wells out of 67 wells exceeded the MCL). Where encountered, water suppliers generally successfully use wellhead treatment to manage the iron.

Perchlorate

Perchlorates are a group of salts derived from perchloric acid and are used as a propellant for rockets and fireworks. The current state MCL for perchlorate of 6 µg/L is currently under review. Known perchlorate contamination in the Region is associated with the Aerojet Corporation plume shown in **Figure 2-29**. Regional water suppliers have been actively engaged and informed of remediation operations associated with the perchlorate at the facility. In some instances, wellhead treatment systems have been employed on water supplier production wells and an important management strategy for cleanup.

2.7. Flood and Stormwater Management Systems

Throughout California, and especially the Central Valley, a complex system of dams and reservoirs, levees, weirs, bypasses, and other features have been constructed over the last 150 years to protect urban and rural areas against periodic flooding. Federal, state, and local jurisdictions often overlap, complement, and at times, conflict with each other to manage this flood risk. The state designates that urban areas should maintain protection from a 200-year-level storm event, but as seen in **Figure 2-4**, areas along the American and Sacramento rivers, especially the downstream western portions of the Region, are susceptible to 100-year floods. **Section 5.6.4.1** discusses plans and the Folsom Dam Joint Federal Project set to provide greater than 200-year flood protection by the year 2025. FloodSAFE California's (FloodSAFE) California's Flood Future (2013b) studied the flood hazards in IRWM regions statewide for 100-year and 500-year floods.[7] This information is summarized in **Table 2-14**.

[7] A "100-year flood" is a flood that has a 1 in 100 chance of being exceeded in any given year. This may also be expressed as the 1% annual chance of exceedence flood, or "1% annual chance flood." Similarly, a 500-year flood has a 1 in 500 (or 0.2%) chance of being exceeded in any given year (DWR 2012a).

Table 2-14. Region's Exposure to Flood Hazards

	100-Year Flood	500-Year Flood
Land Area Exposed (acres)	118,434	241,642
Land Area Exposed (percent of total land area)	15%	31%
Population Exposed (number of people)	51,586	594,234
Population Exposed (percent of total population)	4%	41%
Total Depreciated Replacement Value of Exposed Structures and Contents ($1,000s)	$4,344,109	$13,797,914
Crop Area Exposed (acres)	47,282	81,832
Crop Area Exposed (percent of total crop area)	29%	51%
Value of Exposed Crops ($1,000s)	$66,858	$119,076
Total Sensitive Plants and Animal Species[1]	57	63
Total Essential Facilities[2]	15	250
Transportation Facilities	145	456
High Potential Loss Facilities[3]	20	55
Lifeline Utilities[4]	0	20

Source: DWR, 2013b, California's Flood Future

Notes:
[1] Sensitive species include state and federal listings of endangered and threatened species.
[2] Essential facilities include care facilities, emergency centers, fire stations, police stations, and schools.
[3] High potential loss facilities include dams and hazardous material sites.
[4] Lifeline utilities include potable water, oil, natural gas, electric power, and communication facilities.

Key:
ARB = American River Basin

Several agencies are responsible for operations and maintenance of the Region's flood and stormwater management systems, including nonpoint source water pollution control. Flood management considers systemwide flooding potential, while stormwater management concerns localized storm drainage on a smaller scale, with attendant water quality protections. Responsibilities for flood management generally fall under federal, state, and regional purviews. Federal and state governments also assist local efforts. For example, DWR's FloodSAFE is a long-term strategic initiative developed to reduce flood risk in California, and DWR's flood risk management programs are consolidated under FloodSAFE. In contrast to flood management, stormwater management generally falls under county, city, or local drainage districts or their respective departments. Green infrastructure, stormwater treatment facilities, and rainwater and stormwater capture projects are examples of multi-benefit stormwater projects identified under Storm Water Resource Plans (SWRP). More information on the SWRPs found in the Region may be found under **Section 3.2.2**.

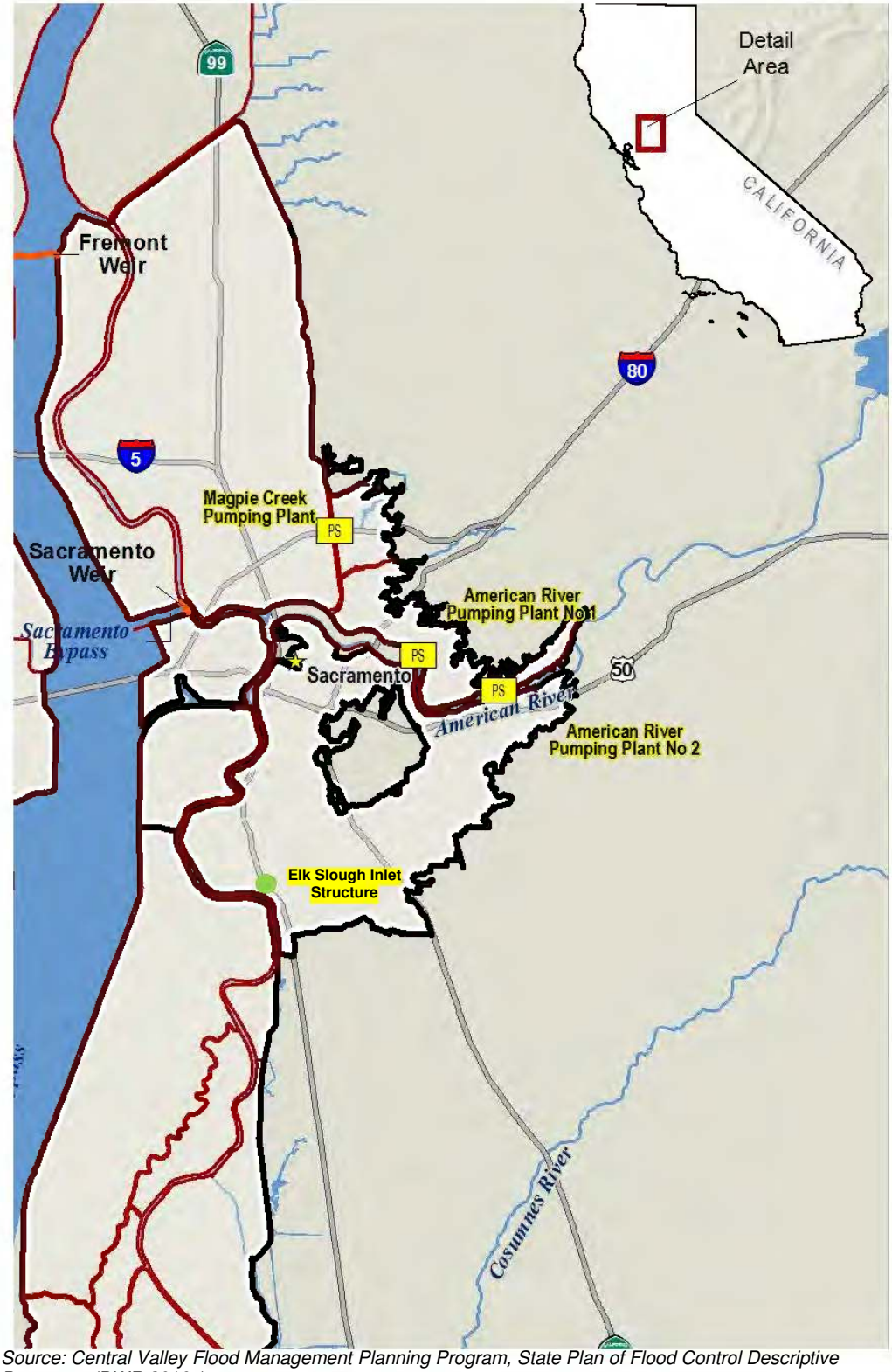
While strategies are highly dependent on regional watershed characteristics, the jurisdictions charged with flood and stormwater management responsibilities typically do not follow or align with watershed boundaries. Accordingly, this subsection begins with a region-wide perspective describing the role of the federal and State governments and the State Plan of Flood Control (SPFC) facilities in higher level flood management. SAFCA, a regional multicounty, multiagency flood management entity spanning parts of two counties, is then characterized. Thereafter, responsible local agencies or partnerships and relevant plans in Sacramento, Placer, and El Dorado counties are described.

2.7.1. Region State Plan of Flood Control Facilities

SPFC facilities, as legally defined in the California Water Code (CWC), are a portion of the flood management system that includes State- and Federally authorized projects under the jurisdiction of DWR, the Central Valley Flood Protection Board, and USACE (DWR 2010). The locations of SPFC facilities are shown in red in **Figure 2-30**. **Table 2-16** characterize the SPFC facilities in the Region.

The vast levee system in the Region is a combination of SPFC and local levees. Levees along larger streams and rivers tend to be under state and federal jurisdiction while levees along smaller local creeks and streams tend to be under local agency jurisdiction—however, there are exceptions.

Many of the storage facilities that contribute to flood management are also operated for other purposes, such as water supply and power generation, but are not part of the SPFC (DWR 2010). Major multipurpose storage projects that contribute significantly to flood management include Folsom Dam and Reservoir and Shasta Dam and Reservoir. Folsom Dam and Reservoir is a multipurpose facility that serves flood control, water supply, recreational, and ecosystem purposes on the American River. Shasta Dam and Reservoir is serves flood control, water supply, recreational, and ecosystem purposes on the Sacramento River. Operations of both dams and reservoirs provide flood protection upstream from the Region. **Table 2-15** characterizes major non-SPFC multipurpose reservoir projects in the Region.



Source: Central Valley Flood Management Planning Program, State Plan of Flood Control Descriptive Document (DWR 2016c)
Note: DWR may alter and update flood management-related maps as the Central Valley Flood Management Planning Project evolves.
Key:
PS =Pump Plant

Figure 2-30. SPFC Facilities in the Region

DWR has studied the current status of SPFC levees and assigned levee hazard classifications according to performance on levee failure assessments. Senate Bill (SB) 5 requires urban areas to provide at least 200-year flood protection as a condition for further development. Nonurban levee design criteria vary depending on local circumstances.

Table 2-15. Major Non-SPFC Multipurpose Reservoir Projects in the Region

Reservoir	Dam	Total Reservoir Capacity (AF)	Flood Storage Capacity (AF)	Owner/Operator
Folsom Reservoir	Folsom Dam	973,000	400,000 to 670,000	Reclamation

Sources: DWR, Central Valley Flood Management Planning Program, State Plan of Flood Control Descriptive Document (2010)
Key:
AF = acre-foot
ARB = American River Basin
SFPC = State Plan of Flood Control

Table 2-16. SPFC Levees in the Region

Levee Location in the Region	Design Capacity (cfs) from O&M Manuals[1]	Classification	Channel Capacity Status[2]
Lower Sacramento River-below Fremont Weir	35,900 to 579,000	Mostly urban	Potential encroachment, Backwater Zone, Sufficient capacity
Bear River	30,000 to 40,000	Nonurban	Potential encroachment, Backwater Zone,
Yankee Slough-Tributary of Bear River	N/A	Nonurban	Potential encroachment
American River	115,000 to 180,000	Urban	Potential encroachment, Sufficient capacity
Natomas East Main Drainage Canal	1,100 to 16,300	Urban	Potential encroachment
Dry Creek-Tributary of Bear River	7,000	Urban	Potential encroachment
Arcade Creek	3,300	Urban	Potential encroachment

Sources: DWR, Central Valley Flood Management Planning Program, State Plan of Flood Control Descriptive Document (2010) and DWR, Flood System Status Report (2017a)
Notes:
[1] Range of design capacity provided for each levee located in the Region.
[2] *Different channel capacity status found along each levee located in the Region.*
Key:
ARB = American River Basin
cfs = cubic-feet per second
N/A = Not Applicable
O&M = operations and maintenance
SPFC = State Plan of Flood Control

The Central Valley Flood Protection Act of 2008 directed DWR to prepare the Central Valley Flood Protection Plan (CVFPP) and 5-year updates for adoption by the Central Valley Flood Protection Board.

The 2012 CVFPP proposed a systemwide investment approach for sustainable, integrated flood management in areas currently protected by SPFC facilities. In 2013, DWR initiated Basin-Wide Feasibility Studies, along with associated Regional Flood Management Planning (RFMP) efforts and the Central Valley Flood System Conservation Strategy, to advance both ongoing and long-term implementation of the CVFPP. RFMP is an important part of flood management improvement planning in the Central Valley. The locally-led RFMP efforts are developing long-term, regional flood management plans that address local needs (such as urban level of flood protection requirements), articulate local/regional priorities, and establish the common vision of regional partners. DWR provided funding and resource support to help develop regional plans consistent with the 2012 CVFPP. In 2014 all regional plans were completed, and in 2017 drafts of both CVFPP Basin-Wide Feasibility Studies (Sacramento River and San Joaquin River) were released and updates to the CVFPP Conservation Strategy were adopted.

The Region, along with the Westside Sacramento IRWM Region, is part of the Lower Sacramento-Delta North Region (separate from Region boundaries), and the West Sacramento Area Flood Control Agency led the RFMP effort. Although these RFMP and IRWM efforts have differing planning boundaries, the two initiatives will coordinate with one another. The Lower Sacramento River/Delta North Regional Flood Management Plan was released in 2014 and the two plans share similar sets of stakeholders. The RFMP was developed to address flood management regionally and identifies pre-feasibility level solutions to flood management issues. See **Section 3.4** for details of coordination between the Region and the Westside Sacramento IRWM Region.

2.7.2. Sacramento Area Flood Control Agency

The City of Sacramento, Sacramento County, Sutter County, the ARFCD, and RD 1000 jointly created SAFCA in 1989 through a Joint Exercise of Powers Agreement to provide the Sacramento region with increased flood protection along the American and Sacramento rivers. SAFCA formed in response to the record flood of 1986 when Folsom Reservoir exceeded its normal flood control storage capacity and several area levees nearly collapsed under the strain of the storm. SAFCA's jurisdiction spans Sacramento County and part of Sutter County and multiple watersheds tributary to the lower Sacramento River, as shown in **Figure 2-4**.

SAFCA's mission is "to reduce flood risk, thereby minimizing the impacts of floods on human safety, health, and welfare; and, consistent with these flood risk reduction goals, to preserve and enhance the environmental and aesthetic values that floodways and floodplains contribute to the quality of life in the Sacramento region." SAFCA is governed by a board of directors that is appointed by its member agencies. The board has 13 members, and holds monthly public meetings. Under the Sacramento Area Flood Control

Agency Act of 1990 (SAFCA Act), the California Legislature conferred on SAFCA broad authority to finance flood management projects and has directed SAFCA to carry out its flood management responsibilities in ways that provide optimum protection to the natural environment. Since then, the SAFCA Act has been amended by Assembly Bill 930 of 2007 allowing SAFCA to acquire land easements as necessary and to use revenues from fees on projects that protect SAFCA's area.

Flood management projects have historically been initiated and funded by either or both federal and state laws, usually in response to major flooding events. Since the passage of Propositions 84 and 1E in 2006, the State (DWR) and state-local partnerships have become increasingly stronger in planning and implementing flood management projects. DWR works with SAFCA in the development and implementation of regional flood management projects and revisions to floodplain mapping. Natomas Basin levees have been recently upgraded in a project jointly funded by the state and SAFCA.

SAFCA receives funding from development fees and annual assessments imposed on properties that benefit in three separate districts in Sacramento and Sutter counties. **Table 2-17** identifies and describes the assessment districts and how the district funding is implemented.

Table 2-17. SAFCA Districts and Funding Expenditures

District	Area Coverage	Funding Expenditures
Operations and Maintenance (O&M) District	Areas within SAFCA's jurisdiction that are influenced by American River flows, contributing tributary creeks, and drainage channels; and are benefitted by SAFCA O&M projects	Annual operation and maintenance
Consolidated Capital Assessment District (CCAD)[1]	Natomas Basin in Sacramento and Sutter counties, plus the portions of the City and County of Sacramento outside Natomas that lie within the 200-year floodplain of the American and Sacramento Rivers and their tributaries in North and South Sacramento.	Capital improvements include Folsom Dam, levees along the American and Sacramento River, and other levees and related flood management facilities
Consolidated Capital Assessment District No. 2 (CCAD 2)	Natomas Basin in Sacramento and Sutter counties, plus the portions of the City and County of Sacramento outside Natomas that lie within the 200-year or greater floodplain of the American and Sacramento rivers and their tributaries in North and South Sacramento that would be benefited by the funded improvements.	This district funds the projects identified in the CCAD, but with an expanded scope based on new knowledge and new flood management standards adopted since 2007.
Natomas Basin Local Assessment District (NBLAD)	Entire Natomas Basin (all properties in Sutter County and Sacramento County in the American Basin)	Capital improvements on Natomas levees

Notes:
[1] Replaced by Consolidated Capital Assessment District No. 2. (M. Klasson, personal communication, 2018).
Key:
O&M = operations and maintenance
SAFCA = Sacramento Area Flood Control Agency

2.7.3. Sacramento County Area

This subsection describes the stormwater and flood management conditions of various agencies or organizations within Sacramento County. In addition, DWR is responsible for levee maintenance along a portion of the Sacramento River. This includes Sacramento County, six incorporated cities therein, a partnership between the county and those cities to jointly manage stormwater quality, a flood control district, and an RD. Sources of information include agency-specific management plans such as: storm drainage system master plans, the county-wide 2016 Local Hazard Mitigation Plan, and the 2009(b) Watershed Management Plan.

2.7.3.1. Sacramento Stormwater Quality Partnership

Stormwater management used herein includes water quantity (storm drainage) and water quality management of urban stormwater runoff, combined sewer system discharges, and larger, system-wide flood flows. Sacramento County and the cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova, collectively known as the Sacramento Stormwater Quality Partnership (SSQP), developed and adopted a Stormwater Quality Improvement Plan in 2009, describing their compliance with their NPDES Municipal Stormwater Permit (NPDES No. CAS082597; Order NO. R5-2008-0142). This permit is issued by the CVRWQCB and covers the fourth term from 2008 to 2013 (SSQP 2009). SSQP submitted, and now contains the 2013 Report of Waste Discharge and a Long-term Effectiveness Assessment for renewing the municipal NPDES permit. The county and each city collaborate on matters of mutual concern but maintain separate jurisdiction over their respective stormwater systems. Each city is briefly discussed in the following subsections.

2.7.3.2. Sacramento County

Sacramento County is responsible for various aspects of stormwater and flood management. The need for flood protection in Sacramento County has been recognized since the mid-to-late 1800s. Sacramento County, bordered by both the Sacramento and American rivers, has previously identified flooding as the county's largest concern in the 2011 Sacramento County Local Hazard Mitigation Plan (Sacramento County 2011b). Sacramento County is vulnerable to five flood types: localized/stormwater flooding, riverine flooding, flash flooding, levee overtopping/failure, and dam failure (Sacramento County 2016).

The Sacramento County Department of Water Resources is responsible for drainage and flood management within the current and future urbanized portions of unincorporated Sacramento County and the cities of Citrus Heights, Elk Grove, and Rancho Cordova. The drainage and flood management system operated and maintained by Sacramento County consists of 1,443 miles of storm drain pipe, 400 miles of creeks and open channels, 33 pump stations, and 18 detention basins (Sacramento County 2018). The Drainage Section

of the Sacramento County Department of Water Resources actively works with SAFCA on the development and implementation of regional flood management projects and revisions to floodplain mapping. This department is also responsible for the Sacramento County Stormwater Quality Program, which aims to improve quality of urban stormwater runoff in partnership with the SSQP.

2.7.3.3. City of Citrus Heights

The Citrus Heights Stormwater Program oversees the operations and maintenance of a storm-drain system consisting of 26 miles of creeks, 54 miles of open ditches, 5.5 miles of concrete-lined channels, 62 bridges, hundreds of miles of pipe, and thousands of catch basins and manholes. The program also provides sandbags before official storm events and information on flood-prone areas. The Citrus Heights Satellite Work Program of the Sacramento Regional Conservation Corps staff performs numerous functions to assist city staff in cleaning and maintaining the creeks and drainage systems throughout Citrus Heights. The goal of the program is to effectively manage stormwater runoff as a resource while improving water quality.

2.7.3.4. City of Elk Grove

Storm drainage in Elk Grove is conveyed through a storm drainage and flood control collection (SD&FCC) system consisting of approximately 400 miles of underground pipes and 60 miles of natural and constructed channels. The terrain throughout Elk Grove is relatively flat, with natural creeks and channels that traverse the city. The eastern portion (primarily east of Waterman Road) is predominantly rural with residences built on large lots and where agricultural uses are common. In 2011, Elk Grove adopted the Stormwater Drainage Master Plan, which identifies, analyzes, and selects stormwater-related projects to upgrade the SD&FCC system. The plan encompasses programs and project locations throughout both urbanized and rural areas in Elk Grove. Elk Grove also collects stormwater utility fees to maintain publicly owned water drainage facilities, manage flood, and execute the Stormwater Quality Program, as a part of the SSQP.

2.7.3.5. City of Folsom

Folsom's Public Works Department, Streets Division, operates and maintains an extensive storm drainage system, including about 190 miles of pipe, 23 miles of natural drainage channels/creeks, 30 flood management and/or water quality detention basins, and over 200 outfalls to creeks/rivers. Since late 2006, Folsom has also been involved in the Alder Creek Watershed Project, a project to manage the 11-square-mile watershed and to protect its natural resources. The 2010 Alder Creek Watershed Management Action Plan identified policies and projects to implement management actions, and some recommended site-specific projects involved floodplain restoration, Natoma Company Dam reservoir management, and stormwater detention basin.

2.7.3.6. City of Galt

Galt's storm drainage infrastructure includes over 70 miles of storm drainage lines spanning 8 inches to 84 inches in diameter, one detention pond, and two pump stations. With a few areas of planned construction, the majority of the existing storm drainage system contains sufficient capacity to convey peak runoff. Localized flooding, however, is a potential concern. Galt lacks curbs and gutters in some portions of the city and the size and capacity of some small agricultural drainage structures do not accommodate larger storm flows. The city collects storm drainage fees to pay for storm drainage operations.

2.7.3.7. City of Rancho Cordova

The Sacramento County Department of Water Resources provides drainage and flood preparedness services to the City of Rancho Cordova (Rancho Cordova), including floodplain management, review of drainage studies and improvement plans, and maintenance of the storm drainage systems. The storm drain infrastructure described under the subsection for Sacramento County includes the Rancho Cordova area. Rancho Cordova is also located within Zones 11A and 11B of the SCWA, which charges a development fee to new projects to fund the planning, design, and construction of new trunk drainage systems capacity. Rancho Cordova residents pay a Stormwater Utility Fee to pay for the bulk of drainage program services.

Rancho Cordova has experienced localized flooding associated with undersized drainage facilities in existing developed and developing areas. Drainage issues have been observed along Sunrise Boulevard south of White Rock Road where surface water flows exceed the capacity of drainage facilities (siphons and overchutes) of the Folsom South Canal. Existing 100-year peak flows have been observed to exceed in several of these facilities and result in localized flooding along Sunrise Boulevard as well as discharge of drainage into the Folsom South Canal.

2.7.3.8. City of Sacramento

The City of Sacramento Department of Utilities provides drainage services within city limits. To manage runoff from city streets, the Department of Utilities maintains 41,000 storm drain inlets, 65 miles of canals and ditches, 104 pump stations, and numerous detention basins (Public Financial Management 2011). Through this series of canals, pipes, and pump stations, water is directed away from homes and into creeks, lakes, and rivers. To assist with flood management, the Department of Utilities works year-round, ensuring that pumps, pipelines, canals, and over 18 miles of levee are maintained to provide flood protection during heavy rainfall. The Downtown, Midtown, Land Park, and East Sacramento portions of the City of Sacramento are served by a combined sewer system. Runoff from these areas, with the exception of some wet-weather runoff, is treated at the SRCSD Regional Wastewater Treatment Plant before it is discharged into the Sacramento River. In emergency situations, the Department of Utilities is in communication with

other agencies such as DWR, the California Department of Public Health, SAFCA, Sacramento County, and various RDs (Sacramento 2013).

2.7.3.9. American River Flood Control District and Reclamation District 1000

Two regional districts operate and maintain flood facilities in the Sacramento County region: ARFCD and RD 1000. The ARFCD was formed in 1927 to maintain the 40 miles of levees along the American River and portions of Steelhead, Arcade, Dry, and Magpie creeks. Year-round activities include mowing levee slopes, trimming vegetation, weed management, rodent abatement, erosion repairs, access roads maintenance, fixing gates, and equipment maintenance.

RD 1000 maintains over 40 miles of levees surrounding the perimeter of the Natomas Basin to contain floodwaters from the Sacramento River, American River, Steelhead Creek (Natomas East Main Drainage Canal), Pleasant Grove Creek Canal, and Natomas Cross Canal (which is outside the Region). RD 1000 also operates and maintains hundreds of miles of canals and seven pump stations in the Natomas Basin to collect and safely discharge the rain that falls within the Natomas Basin back into the river.

2.7.3.10. Maintenance Area 9

DWR is responsible for levee maintenance in Maintenance Area 9. Maintenance Area 9 encompasses the Sacramento River East Levee from Sutterville Road south to the northern end of Snodgrass Slough.

2.7.4. Placer County Area

This subsection describes the stormwater and flood management activities of Placer County, Placer County Flood Control and Water Conservation District (FCWCD), and five incorporated cities or towns within Placer County. Sources of information include each agency's stormwater management plan (SWMP) and each agency's Web site describing their stormwater and flood-management related programs.

2.7.4.1. Placer County

The Placer County Public Works Department has Floodplain Management and Stormwater Quality Management Programs. The Floodplain Management Program administers FEMA policies through a community effort of corrective and preventive measures for reducing flood damage to properties. This program is responsible for supervising flood zone building requirements and flood insurance programs in unincorporated areas in Placer County. Placer County's Stormwater Quality Program aims to reduce pollutants in stormwater runoff, eliminate non-stormwater discharges and lessen the long-term impacts of stormwater discharges from development, business, and municipal activities. The plan also complies with NPDES requirements. The West Placer SWMP applies to the unincorporated areas of Placer County in the

Region. Placer County also works closely with Placer County FCWCD, which is responsible for regional flood management planning, management, and mitigation.

Placer County has also implemented flood and stormwater-related projects through the Placer Legacy Open Space and Agricultural Conservation Program. A few projects, such as the Sundance-Lakeview Farms in 2008 included riparian property acquisitions or conservation easements, and a part of their reported benefits consisted of integrated flood-ecosystem management, floodwater conveyance, and floodwater storage (Placer County 2012).

2.7.4.2. Placer County Flood Control and Water Conservation District

The Placer County FCWCD was established in 1984 by the State Legislature as a Special District, separate from county government, to address flood management issues arising with urban growth. Placer County FCWCD boundaries are the same as the Placer County boundaries. The primary purpose of the Placer County FCWCD is to protect lives and property from the effects of flooding by comprehensive, coordinated flood prevention planning (Placer County 2009). The Placer County FCWCD is responsible for identifying solutions for regional flood management for the entire county and for providing or assisting in coordination for regional projects. The Placer County FCWCD is also responsible for managing flood issues for multiple communities in Placer County, including Roseville, Rocklin, Lincoln, Loomis, and Auburn.

Placer County FCWCD has three separate plans with flood management objectives. The 1992 Auburn Bowman Flood Control Plan covers 41.5 square miles and identifies flooding problems, makes specific recommendations to address them, and develops a funding mechanism to implement the recommendations. The 1993 Cross Canal Watershed Flood Control Plan studies the area drained by Auburn and Markham Ravine, Coon, Curry and Pleasant Grove creeks. The Natomas Cross Canal carries the combined flow of these creeks to the Sacramento River. This study was prepared to respond to concerns over potential increases in flooding in the lower portion of the watershed due to urban development potential upstream. Finally, the Dry Creek Watershed Flood Control Plan was updated in 2011, which evaluates existing flooding problems and identifies flood management options as well as a funding mechanism to achieve plan recommendations. This updated plan recommends building regional detention basin projects for peak flow attenuation, implementing a flood warning system, repairing bridges and culverts, supporting building elevation and floodplain buy-outs, and incorporating LID measures.

2.7.4.3. City of Auburn

Auburn's Public Works Department is responsible for the operation, maintenance and management of stormwater infrastructure. Auburn has a 2003 SWMP to reduce pollutants in stormwater runoff, to comply with NPDES stormwater regulations, and to meet the state's general permit. Auburn contains seven main

drainage basins: Auburn Ravine Creek, Lincoln Basin, North Fork American River Basin, Brewery Lane Basin, Baltimore Ravine Basin, Dutch Ravine Basin, and Mormon Ravine Basin. These waterways are used for recreation, habitat, fishing, and water supply. Adverse effects to the waterways are reduced by six federally designated minimum control measures, and Auburn annually reports on the implementation of these measures.

2.7.4.4. City of Lincoln

The Lincoln Department of Public Works/Operations Division is responsible for operating and maintaining the drainage systems within the city limits. Storm runoff drains to Markham Ravine and Auburn Ravine in the northern portion of Lincoln. The other surface water drainage systems include Ingram Slough, the Orchard Creek watershed, and a minor portion of the Pleasant Grove Creek watershed, which is located at the southern end of Lincoln. Presently, community residential and commercial development exists within the Auburn Ravine and Ingram Slough watersheds. The annexed lands south of Lincoln are in the remaining watersheds. Surface water in Lincoln is dominated by the seasonal rainfall runoff flows from the Markham Ravine and Auburn Ravine watersheds.

2.7.4.5. Town of Loomis

Loomis's Department of Public Works and Engineering has responsibility for stormwater management. The SWMP updated in 2008 complies with NPDES requirements and was approved by the CVRWQCB The SWMP aims to improve the quality of water in Loomis's two natural streams: Secret Ravine and Miners Ravine, both a part of the Dry Creek Watershed. The SWMP developed and implements an interdisciplinary approach to stormwater. Of the six federally mandated minimum control measures, Loomis considers post-construction stormwater management to be the best use of its resources in achieving better water quality. Because Loomis is a part of the Dry Creek Watershed, the Dry Creek Conservancy is also active in preserving local streams. Its actions also complement stormwater and flood management.

2.7.4.6. City of Rocklin

The Rocklin Department of Public Works maintains all storm drain infrastructure in Rocklin. Rocklin has had a municipal NPDES stormwater discharge permit since 2003, and implements its 2003 Stormwater Management Program. This program originally proposed six minimum control measures, which ranged from development of public education and outreach to enforcement of illicit discharge detection and elimination program. Recently, the program has expanded to include volunteer stormwater management projects, incorporation of nonstructural Best Management Practices (BMP), and focus on urban water runoff quality. Rocklin provides stormwater management guides and pollution prevention tips to various water users and potential polluters.

2.7.4.7. City of Roseville

The Roseville Department of Environmental Utilities is responsible for drainage and stormwater management within Roseville's city limits. Roseville's 2004 SWMP meets the NPDES discharge requirements and Waste Discharge Requirements. As required for SWMPs, Roseville has six minimum control measures that are implemented through BMPs. The SWMP originally planned for a 5-year implementation period, but the planned measures and BMPs are still relevant and continue to be executed, as seen in Roseville's Annual Progress Reports. Roseville also has progressive public involvement and outreach activities related to stormwater management.

2.7.5. El Dorado County Area

The El Dorado County Department of Environmental Management is responsible for drainage and stormwater management in the unincorporated areas of western El Dorado County. Along with the Departments of Transportation, General Services, Agriculture, Planning and Building, the Department of Environmental Management operates a stormwater management program to manage and improve stormwater quality. In general, the county's Stormwater Coordinator is responsible for:

- Preparing and updating SWMPs
- Approving stormwater treatment practices
- Providing Stormwater Construction Permits
- Maintaining close communication with the CVRWQCB
- Overseeing and coordinating implementation of the SWMP
- Monitoring the program
- Evaluating the program and reporting to the CVRWQCB annually

In addition, there are several community service districts in El Dorado County that provide operations and maintenance services for drainage facilities. El Dorado County also provides flood rate mapping information through its Planning Services.

2.8. Water Delivery and Wastewater Systems

This subsection describes currently existing pumping facilities, transmission facilities, collection systems, treatment facilities, storage facilities, fire protection systems, and physical plants of regional scale for the Region. Thereafter, there are per agency descriptions on the agency's water system (where applicable),

groundwater system (where applicable), and wastewater treatment and recycled water system (where applicable). Agencies are described in order, generally from northeast to southwest; starting north of the American River, and then south. Dedicated wastewater agencies (i.e., agencies that do not supply surface or groundwater) are discussed in latter portions of this subsection (starting with Placer County in **Section 2.8.26**), unless the agency is a combined water and wastewater utility.

Information for this subsection is primarily from a synthesis of each agency's description with information available from UWMPs, SWRPs, Water Supply Master Plans, Water Supply Infrastructure Plans, and/or Sewer System Management Plans (SSMP). A few of the smaller agricultural water agencies, Clay Water District, Galt Irrigation District, and Omochumne-Hartnell Water District (OHWD), are not described below. These districts formed initially to purchase water supplies in areas that derive water supply from private irrigation wells. These agencies have historically purchased very limited surface water supply and have limited water supply infrastructure (SAWC 2011).

2.8.1. Major Water Supply and Wastewater-Related Infrastructure

Folsom Dam on the American River and Shasta Dam on the Sacramento River, both parts of the CVP, operated by Reclamation are major sources of raw surface water to the Region. In addition to these reservoirs, there are 15 surface WTPs and 14 groundwater treatment plants in the Region. Many agencies also have groundwater wells, many with some form of onsite wellhead treatment. The locations of these water treatment plants are shown in **Figure 2-5**. Existing WTPs and their respective capacities are listed in **Table 2-18**.

There are more water agencies than WTPs in the Region. Many agencies share joint intakes, treatment plants, and pipelines to deliver municipal water. For example:

- PCWA owns and operates a pipeline from the upper American River and it also owns and operates raw water infrastructure from the Yuba and Bear River to provide treated water to Lincoln and Roseville, in addition to serving its own Auburn, Loomis, and Rocklin service area.

- SJWD's Sidney N. Peterson WTP is located near Folsom Reservoir, treating and delivering water to Citrus Heights Water District (CHWD), FOWD, Orange Vale Water Company (OVWC) the Ashland portion of Folsom, and San Juan's retail service area. It also periodically treats water for SSWD and Roseville when they have supplemental surface water supplies available.

- Sacramento's Fairbairn WTP and the Sacramento River WTP treat water for the City of Sacramento and for other agencies, including SSWD, Fruitridge Vista Water Company (FVWC), Cal-Am, and SCWA south of the American River in Sacramento County.

- The Freeport Project serves both SCWA and EBMUD's interests; Vineyard WTP treats Sacramento River water and delivers it within SCWA and to a portion of Elk Grove.

- CWD provides water to its district and to GSWC.

Table 2-18. Treatment Capacity at Existing/Planned WTPs in the Region

Source Water/Facility	Year Constructed or Last Expanded	Design Hydraulic Capacity (MGD)	Permitted Capacity (MGD)	Ultimate Capacity (MGD)
Upper American River				
PCWA				
Bowman WTP	1983	7	7	7
Auburn WTP	2005	8	8	8
Foothill WTP	1982	58[8]	60[8]	63[8]
Sunset WTP	1969	8	8	8
Ophir	2023	-	-	60
Folsom Reservoir				
EID				
El Dorado Hills WTP	2010	26	26	26
Folsom				
Folsom WTP	n/a	50	50	50
Roseville				
Roseville WTP	2008	100	100	100
SJWD				
Sidney N. Peterson WTP[1]	2010	150	150	150
Lower American River				
GSWC				
Coloma WTP	2002	9	9	9
Pyrites WTP	n/a	5.4	5.4	5.4
CWD				
Bajamont WTP	2001	22	22	22

Table 2-18. Treatment Capacity at Existing/Planned WTPs in the Region (contd.)

Source Water/Facility	Year Constructed or Last Expanded	Design Hydraulic Capacity (MGD)	Permitted Capacity (MGD)	Ultimate Capacity (MGD)
Lower American River				
City of Sacramento				
E.A. Fairbairn WTP	**2005**	**200**	**200**	**200**
Sacramento River				
City of Sacramento				
Sacramento River WTP	**2003**	**160**	**160**	**160**
SCWA				
Vineyard Surface WTP[2]	**2012**	**50**	**50**	**100**
Cosumnes River				
Rancho Murieta CSD				
Rancho Murieta WTPs[3]	**1995**	**n/a**	**3.5**	**6**
Groundwater (Offsite or Centralized Groundwater Treatment Plants)				
Elk Grove WD				
Railroad Street Treatment and Storage Facility	2005	10.4	10.4	10.4
City of Galt				
Golden Heights WTP	n/a	n/a	n/a	n/a
Industrial Park WTP[7]	n/a	n/a	n/a	n/a
SCWA				
Mather Housing WTP	1976	6	6	6
Waterman WTP	1991	8.6	8.6	8.6
Calvine Meadows WTP [4], [7]	2000	5	5	5
East Park WTP	2001	2.9	2.9	2.9
Dwight WTP	n/a	n/a	n/a	n/a
East Elk Grove WTP	2002	13	13	13
Anatolia WTP[5], [7]	2005	13	13	13
Wildhawk WTP	2006	10	10	10
Lakeside WTP	n/a	6.5	6.5	6.5
Poppy Ridge WTP[6], [7]	2025	6.5	6.5	6.5
Big Horn WTP	n/a	13	13	13

Data Sources: EID Integrated Water Resources Master Plan (2013), EID UWMP (2016a), PCWA UWMP (2016), GSWC UWMP (2016a), City of Folsom UWMP (2016), SCWA Zone 40 Water System infrastructure Plan (2016b), and direct agency comments (May 2013).

Notes:

[1] In 2012, SJWD evaluated the Sidney N. Peterson WTP's capacity. DPH approved the new permit for 150 MGD.

[2] The SCWA Vineyard WTP's design capacity has been increased from 85 MGD to 100 MGD to accommodate the replacement water supply to customers in east Sacramento County whose groundwater supply has been contaminated by Aerojet operation.

[3] Rancho Murieta has plans to expand their WTPs to a capacity of 6 MGD

[4] Zone 40 Water System infrastructure Plan Update

[5] The Anatolia WTP expansion from 6.5 MGD to 13 MGD in the future.

[6] Zone 40 Water System Infrastructure Plan Update

[7] 2013 ARB IRWMP reported values were used as no 2016 sources were available to update capacity values for each respective facility.

[8] Updates as of 2018.

[9] Expected to be constructed in the next 5 years.

Key:
CWD = Carmichael Water District
EID = El Dorado Irrigation District
GSWC = Golden State Water Company
MGD = million gallons per day
N/A = not applicable
PCWA = Placer County Water Agency
SCWA = Sacramento County Water Agency
SJWD = San Juan Water District
WD = Water District
WTP = water treatment plant

There are also 11 WWTPs in the Region, as shown in **Figure 2-6** and listed in **Table 2-19**. Sewer system management is operated by individual agencies or sanitation districts, and they update their management plans periodically. Some agencies serve both water supply and wastewater roles. Others, such as Placer County and SRCSD, collect and treat wastewater across a large area from numerous water supply agencies. Permits are issued by the State Water Board, under the Statewide General Waste Discharge Requirements for Order No. 2006-0003-DWQ adopted May 2, 2006.

Common infrastructure linking adjacent water and wastewater systems include hundreds of miles of transmission mains and multiple interconnections, although not all interconnections are currently used.

Table 2-19. WWTPs in the Region

Owner	WWTP Name	Type of Treatment	Capacity (MGD)	Discharge Location	Recycled Water Production
EID	El Dorado Hills WWTP	Tertiary	4.0	Carson Creek	Yes
Lincoln	Lincoln WWTRF	Tertiary	5.9	Auburn Ravine	Yes
City of Auburn	Auburn WWTP	Tertiary	1.65	Auburn Ravine	No
Placer County	Placer County No. 3	Tertiary	0.301	Miners Ravine	No
Placer County	Sheridan WWTP	Secondary and chlorination	0.061	Land Application	No
Roseville	Dry Creek WWTP	Tertiary	18	Dry Creek	Yes
Roseville	Pleasant Grove WWTP	Tertiary	12	Pleasant Grove Creek	Yes
SRCSD	Sacramento Regional WTP	Secondary3	181	Laguna Creek	No
SRCSD	Sacramento Regional WRF	Tertiary	3	Laguna Creek	Yes
Rancho Murieta	Rancho Murieta WWTF	Secondary and Tertiary	1.55; 3.04	Cosumnes River	Yes
City of Galt	City of Galt WWTP	Tertiary	3.0	Laguna Creek	Yes

Data Source: State Water Board Wastewater Treatment Facilities Database (February 22, 2001), UWMPs, SSMPs, SRCSD 2020 Master Plan 2008, and direct agency comments (May 2013)
Notes:
[1] Average dry weather flow capacity
[3] Treatment upgrades are currently in planning and design to meet recent NPDES requirements necessitating facility upgrade
[4] 1.55 MGD secondary treatment capacity and 3.0 MGD tertiary treatment capacity
Key:
ARB = American River Basin
EID = El Dorado Irrigation District
MGD = million gallons per day
n/a = not available
R. = River
SRCSD = Sacramento Regional County Sanitation District
WRF = Water Reclamation Facility
WWTF = Wastewater Treatment Facility
WWTP = Wastewater Treatment Plan
WWTRF = Wastewater Treatment and Reclamation Facility

2.8.2. Placer County Water Agency

PCWA owns and operates reservoirs with permitted water rights in the American River Basin of the Sierra Nevada, upstream from the Region, and delivers this water throughout Placer County. PCWA also has

significant contract rights to surface water from the Pacific Gas & Electric Company. Its canals and pipelines connect to other water agencies in Placer and Sacramento counties, making PCWA a regionally important source and transporter of water. In its service area, PCWA provides surface water to retail and wholesale municipal and industrial (M&I) customers. In addition, PCWA provides surface water to agricultural customers in its service area. PCWA's service area in the Region is developing from rural to urban uses.

2.8.2.1. Placer County Water Agency Water System

The PCWA service area is the entire County of Placer, established under its formation in the Placer County Water Agency Act (PCWA Act). The PCWA Act provides for the establishment of geographic zones for the purpose of assessing costs of projects, setting rates, and operating rules and regulations. In 2017, PCWA established Zone 6 for water service in the entirety of its western water system, spanning from the upper foothills westward. Zone 6 covers retail and wholesale service, and untreated and treated deliveries. Zone 6 covers four previously established administrative zones, Zones 1, 2, 3 and 5, as well as previously existing wholesale areas not covered by a zone. The intent of Zone 6 was to consolidate administrative practices and rates for the agency, with the objective of greater equity.

Zone 1 is the largest zone and is nearly contiguous with the American River Basin Region. Zone 1 includes areas under the land-use authorities of the cities of Auburn, Rocklin, and Lincoln, a portion of Roseville, the Town of Loomis, and Placer County. The zone boundary extends from the Auburn to Lincoln, and the area south that extends to the Sacramento County line. PCWA provides the sale of wholesale treated water to the City of Lincoln and the California American Water Company. There are 16 storage tanks within the Region providing approximately 57 million gallons (MG) of storage capacity. PCWA is planning to construct a 10 MG storage tank in Rocklin within the next five years and additional storage expansion projects through build-out. There are approximately 600 miles of treated water pipeline in the PCWA's western water system. Zone 2 is a single Placer County neighborhood surrounded by west Roseville, which is supplied by a wheeling agreement through interties with the city. Zone 3 covers the foothill areas east of Auburn, which currently includes 4 decentralized surface WTPs and distribution systems.

Zone 5 was created to reduce reliance on groundwater supplies by providing surface water for commercial agricultural in western Placer County, generally west of Lincoln. PCWA delivers surface water from its water rights to the Roseville and SJWD via the M&I diversion at Folsom Reservoir.

For its retail deliveries, about a third of the total water supplied by PCWA (including areas outside the Region) is used for treated drinking water distributed through 8 individual treated water systems. The PCWA treated water systems supply over 30,000 residential service connections and 100,000 persons.

About two-thirds of the total water supplied by PCWA is untreated water wholesaled to other water purveyors or used for irrigation of farms, ranches, landscapes, parks, and golf courses throughout Placer County. PCWA operates about 165 miles of canals, reservoirs, and diversions to supply approximately 4,200 raw water users. Approximately 2,800 irrigation water customers purchase irrigation water on a year-round basis while another 1,400 customers purchase irrigation water seasonally. Recycled water use for irrigation in areas adjacent to Lincoln and Roseville is anticipated to reach near five thousand acre-feet (TAF) per year by 2030.

2.8.3. City of Lincoln

Lincoln supplies a combination of surface water (treated water purchased from PCWA), groundwater, and recycled water to its service area. The subsection below describes Lincoln's surface water, groundwater, wastewater, and recycled water systems.

2.8.3.1. City of Lincoln Water System

Lincoln's service area is in northern western Placer County, an area that had seen heavy development in the past decade. Lincoln receives surface water from PCWA and NID that is treated at PCWA's Sunset and Foothill WTPs. Lincoln supplies potable water through a pressurized distribution system consisting of six pressure zones. The distribution system has three gravity storage tanks with 1.5 MG, 3 MG, and 5 MG capacities, respectively, and one 1.5 MG pumped storage tank (Lincoln 2017b).

2.8.3.2. City of Lincoln Groundwater System

Lincoln currently operates 5 groundwater wells to supplement its surface water supply. These wells can supply 10 percent of the annual demand during a normal year. During emergency outages and daily shortages related to seasonal peaks, the wells can supply more than 30 percent of the demand (Lincoln 2016). Lincoln plans to install additional wells to meet 75 percent of average day demand at build-out.

2.8.3.3. City of Lincoln Wastewater and Recycled Water System

The Lincoln Department of Public Services owns, operates and maintains a sanitary sewer system. The system collects and treats wastewater at the Lincoln Wastewater Treatment and Reclamation Facility (WWTRF) located on the Auburn Ravine. The WWTRF was recently expanded and upgraded, which increased the design average dry weather flow from 4.2 MGD to 5.9 MGD. The WWTRF has a future expansion potential of up to 30 MGD. Lincoln's WWTRF has received recognition for its records of safety and compliance.

Lincoln's WWTRF also produces recycled water, which is currently used for industrial and common area landscape irrigation at four sites with a net irrigation area of 382 acres. All new developments include

"purple pipes" for distribution and delivery of recycled water to augment other water supplies. Lincoln is planning to expand its recycled water deliveries from its water reclamation facility and is considering expansion options that could accommodate wastewater flows from nearby agencies through a potential partnership arrangement called the Midwestern Placer Regional Sewer Project. Lincoln, Placer County, and Auburn proposed and initiated their Midwestern Placer Regional Sewer Project in March 2012. This project will include three parts: 1) sewage pumps stations will be added at the Auburn and North Auburn Wastewater Treatment Plants, 2) a pressurized pipe will be added to the new sewage pump stations at Auburn and North Auburn Wastewater Treatment Plants to move sewage to Lincoln, and 3) the Lincoln WWTRF will be expanded to take in the sewage from Auburn and North Auburn Wastewater Treatment Plants (Lincoln 2018).

2.8.4. City of Roseville

Roseville's service area is in the incorporated city limits in Placer County, near the boundary of Placer and Sacramento counties. Roseville serves a combination of surface water, groundwater and recycled water throughout its service area. Roseville also operates its own wastewater collection and treatment systems. The subsection below describes existing components of its surface water, groundwater, wastewater, and recycled water systems.

2.8.4.1. City of Roseville Water System

Roseville is served by five pressure zones with a small portion served by PCWA due to topography. There are 15 total interconnections between Roseville and neighboring agencies for emergency, backup, and special service needs. There are five total interconnections with PCWA, three 12-inch interconnections with SJWD, three interconnections with Cal-Am, two interconnections with CHWD, and one connection with Sacramento Suburban Water District. Roseville uses three booster pumping stations to increase and maintain pressure to its Zone 5, Zone 2, and Zone 1 pressure zones in east Roseville (Roseville 2016b).

Water distribution is accomplished through over 583 miles of water transmission and distribution mains ranging in size from 4 inches to 66 inches in diameter. The water system currently has 32 MG of storage to manage flow fluctuations on a daily basis and for emergency needs, and is projected to need a total of 49 MG of storage at system build-out. The storage infrastructure includes five pre-stressed concrete storage tanks each with a capacity of 2.9 MG, 4 MG, 6 MG, 7.25 MG, and 10 MG, and one steel storage tank with a capacity of 2 MG.

Roseville operates a 100 MGD WTP on Barton Road near Folsom Reservoir in the Granite Bay community. Raw water from Folsom Reservoir is conveyed to the WTP through parallel 60-inch and 48-inch pipelines.

2.8.4.2. City of Roseville Groundwater System

By practice and city policy, Roseville uses its groundwater supplies for backup and dry year water supply. Roseville currently has six wells but there are plans to add 10 additional wells. All six existing wells are equipped for both groundwater extraction and injection as part of Roseville's Aquifer Storage and Recovery (ASR) Program. Other wells will be equipped similarly following regulatory approval. The ASR program has received all approvals from regulatory agencies and intends to store surplus drinking water in underground aquifers for later recovery during drought/shortage conditions.

2.8.4.3. City of Roseville Wastewater and Recycled Water System

Roseville's Environmental Utilities Department studies, operates, and manages Roseville's wastewater collection and treatment system. Roseville currently operates two regional wastewater treatment facilities serving approximately 45,000 residential, 1,932 commercial, and 600 industrial sewer connections (Roseville 2016a). Approximately 751 miles of sewer collection pipe connects to the Dry Creek WWTP, located in Central Roseville, and the Pleasant Grove WWTP, located in northwest Roseville. The Dry Creek WWTP has an average dry weather flow (ADWF) capacity of 18 MGD and the Pleasant Grove WWTP has an ADWF capacity of 12 MGD. Effluent from both WWTPs is tertiary-treated, meeting Title 22 recycled water standards.

Roseville's recycled water system predominantly serves landscape irrigation demands. The program has continued to expand since its beginning in 1998. The Dry Creek WWTP and Pleasant Grove WWTP recycled water systems are independent but are interconnected. The Pleasant Grove WWTP system includes a network of 20-inch transmission pipelines; the Dry Creek WWTP system includes a network of 8- to 20-inch pipelines to serve landscape irrigation purposes for golf courses, streetscapes, parks, and irrigation and processing water at both WWTPs. Both WWTPs have the capacity to produce additional recycled water supplies for industrial and landscape irrigation uses, if needed. Roseville currently supplies recycled water to a major golf course (Morgan Creek Golf Course) within Cal-Am's service area.

2.8.5. California American Water

Cal-Am is a privately owned public utility with services areas throughout California. Cal-Am provides surface water and groundwater to ten service areas in its northern division, eight of which are in the Region covered by the ARB IRWMP (Cal-Am 2016a). Nine service areas are in Sacramento County and one is in Placer County.

2.8.5.1. California American Water Water System

Cal-Am operates eight distinct water systems in the Region. Four of the service areas are located north of the American River: Antelope, Lincoln Oaks, Arden, and West Placer. Four of the service areas are located

south of the American River: Security Park, Suburban Rosemont, Walnut Grove, and Parkway. Cal-Am purchases a mix of surface and groundwater on a wholesale basis from the City of Sacramento, PCWA, and SSWD. Cal-Am plans to construct an intertie with Zone 40 of SCWA in the near future to serve Security Park. Cal-Am has an agreement for surface water deliveries from the City of Sacramento into its Parkway Service Area and has made arrangements for surface water deliveries for conjunctive use operations in Antelope and Lincoln Oaks. All other Cal-Am service areas are served by groundwater.

2.8.5.2. California American Water Groundwater System

Cal-Am's existing water supply facilities includes a network of more than 100 wells. Cal-Am customers are generally served by direct-feed groundwater wells, with iron and manganese treatment facilities in its Parkway system. Several wells in Cal-Am's Suburban Rosemont and Security Park System are either threatened or have been impacted by groundwater contamination emanating from the Aerojet and former Mather AFB. One well (Moonbeam) has granular activated carbon treatment that removes contaminants before use as a potable supply. In addition, several wells in the Parkway, Lincoln Oaks, Suburban Rosemont, and Security Park systems have been impacted by PCE. Three wells in Lincoln Oaks and one in Parkway currently have granular activated carbon systems that are used to remove PCE.

2.8.6. San Juan Water District

Located adjacent to Folsom Reservoir, SJWD is a wholesale and retail agency. The wholesale area consists of 45 square miles and includes SJWD's retail service area along with CHWD, FOWD, OVWC, and Folsom (Ashland area).

2.8.6.1. San Juan Water District Water System

SJWD receives water diverted from Folsom Reservoir, via Folsom Dam, to the Sidney N. Peterson WTP through 84-inch and 72-inch pipelines. This WTP obtained a new permit following a capacity evaluation in 2012 that expanded its permitted capacity to 150 MGD. From the WTP, finished water is conveyed through Hinkle Reservoir (62 MG capacity) at the WTP site for delivery. SJWD owns, operates, and maintains approximately 220 miles of pipeline and six pump stations (SJWD 2017) to deliver water to retail and wholesale customers (SJWD 2018). Along with Hinkle Reservoir, SJWD has three smaller storage facilities for treated water: Kokila Reservoir (4.5 MG), Los Lagos Tank (1.6 MG) and Mooney Ridge Hydropneumatic Tank (0.05 MG) which are used for storage in the SJWD retail service area.

The Cooperative Transmission Pipeline (CTP) serves most of the SJWD wholesale area (FOWD, CHWD, OVWC), as well as SSSWD when it has supplemental surface water supplies treated by SJWD. Between the WTP and C-Bar-C Park, the CTP consists of about 9,000 feet of 78-inch-diameter pipe and almost 20,000 feet of 72-inch-diameter pipe with several 30- to 48-inch-diameter stubs. The CTP provides

redundancy to the older water transmission system, allowing for maintenance and rehabilitation without service interruption. Some of these older transmission mains, which were constructed in the early 20th century, are still used in conjunction with the CTP to deliver water to FOWD (the 40-inch-diameter pipeline known as the "Fair Oaks 40") and CHWD (42- diameter pipeline). San Juan also has a 33-inch-diameter pipeline along Barton Road with an interconnection with Roseville.

SJWD has 15 connections with neighboring agencies. One of these connections is at the C-Bar-C Park where the Antelope Transmission Pipeline (ATP) begins, extending westward from the CTP, at times conveying SSWD's supplemental surface supplies treated by SJWD. The CTP and the ATP is a two way supply chain, a pump back project that occurs from SSWD to SJWD. SJWD also has a 42-inch and 54-inch connection to the CTP at Bacon Pump Station and multiple 12-inch connections off the CHWD 42-inch pipeline. SJWD has seven intertie connections that are for emergency response and are normally closed. These include two interconnections with Roseville, two with PCWA, one with OVWC, and one with CHWD.

The eight remaining connections are used regularly to supply the wholesale service area. SJWD's connections for the wholesale area include three with OVWC and two with FOWD and three to CHWD. In addition, a pump station is used to deliver water to the City of Folsom's Ashland service area.

2.8.7. Orange Vale Water Company

Located immediately south of SJWD, OVWC is a mutual water company. One of SJWD's wholesale customers, OVWC currently provides surface water to its service area but no longer supplies groundwater. The subsection below describes the OVWC water system.

2.8.7.1. Orange Vale Water Company Water System

OVWC purchases treated surface water from SJWD per a wholesale agreement. Surface water provided by SJWD is treated at Sidney N. Peterson WTP. Treated water is transported to Hinkle Reservoir and delivered to OVWC through the CTP at five metered locations. Water is then distributed by gravity through the OVWC system. The OVWC water system consists of over 75 miles of pipeline, ranging from a 1.5-inch to a 30-inch diameter. The system also includes approximately 1,100 distribution system valves and 5,500 active connections (OVWC 2018). OVWC does not currently have any storage or treatment facilities (OVWC 2011).

2.8.8. Citrus Heights Water District

CHWD is located southwest of SJWD and adjacent to OVWC. Also a SJWD wholesale customer, CHWD currently provides surface water and groundwater to its service area. This subsection includes a description of CHWD's surface water and groundwater distribution systems.

2.8.8.1. Citrus Heights Water District Water System

CHWD has about 271 miles of transmission and distribution mains and maintains 23 interconnections with adjacent agencies which include SJWD, OVWC, FOWD, CWD, SSWD, Cal-Am, and Roseville. CHWD has three pressure zones and has no storage tanks or water treatment facilities, as it purchases treated surface water, delivered by gravity, from SJWD per a wholesale agreement (CHWD 2011). The treated surface water from SJWD is obtained through its 42-inch diameter transmission main. Additional water is also received from the CTP.

2.8.8.2. Citrus Heights Water District Groundwater System

To supplement its surface water supply, CHWD currently operates six groundwater wells, with a projected total yield of 5,000 acre-feet per year (AFY) (CHWD 2016). In the past, groundwater production has averaged approximately 850 AFY. The CHWD plans on adding four additional wells within the next 12 years to maintain groundwater supply reliability and conjunctive use (CHWD 2016).

2.8.9. Fair Oaks Water District

FOWD is located south of OVWC and CHWD and is adjacent to the lower American River. One of SJWD's wholesale customers, FOWD currently provides a combination of surface water and groundwater to its service area. The subsection below describes the existing surface water and groundwater systems.

2.8.9.1. Fair Oaks Water District Water System

FOWD currently purchases surface water from SJWD per a wholesale agreement. FOWD has two types of connections: surface water supply and emergency. There are two surface water supply connections with SJWD. FOWD operates three pressure zones and has five emergency interconnections with adjacent agencies, all of which are normally closed. The three interconnections with CHWD range in size from 6 to 12 inches in diameter. The interconnection with CWD is 8 inches in diameter and is equipped with a 12-inch, one-way meter to CWD. FOWD also has an 8-inch interconnection with OVWC. The district has one storage tank and booster pump (3 MG capacity).

FOWD has two primary transmission mains (Northern and Southern Transmission Mains). From the connection with SJWD, the Northern Transmission Main connects to both the 39-inch Filbert Avenue Main (which conveys water from the CTP/NTP and is the primary source of water) and the Fair Oaks 40-inch

Main. The Northern Transmission Main consists of about 22,000 feet of 27- to 24-inch-diameter concrete pipe. The Southern Transmission Main runs southeast from the Fair Oaks 40-inch Main to near the Upper Pressure Zone Storage and Pumping Station before turning west. The Southern Transmission Main consists of about 20,000 feet of 30- to 28-inch-diameter steel pipe. The primary source of water to the Southern Transmission Main is the Fair Oaks 40-inch Main.

2.8.9.2. Fair Oaks Water District Groundwater System

To supplement its surface water supply, FOWD currently operates six wells, most of which are located in the east/central portions of FOWD's water system. Their capacities range from 500 gallons per minute (gpm) to 2,700 gpm. Groundwater typically accounts for about 10 percent of the FOWD's total water supply.

2.8.10. Carmichael Water District

Located adjacent to the lower American River, CWD is generally a self-sufficient water agency, with its own water rights and water infrastructure. CWD supplies a combination of surface water and groundwater to its service area. The subsection below describes the components of the surface water and groundwater systems.

2.8.10.1. Carmichael Water District Water System

The CWD water system consists of three pressure zones. To serve all three zones, CWD pumps water from the American River at Bajamont WTP (22 MGD capacity with a 28 MGD pumping capacity) on the lower American River downstream from Folsom Dam. The WTP was constructed in 2001, along with its associated 2 MG storage reservoir. The distribution system also includes two storage tanks (1 MG and 3 MG) and one additional storage reservoir.

CWD currently has four interconnections that are used primarily for emergency purposes. These interconnections are normally closed. There are interconnections with FOWD, CHWD, SSWD, and GSWC (CWD 2016).

2.8.10.2. Carmichael Water District Groundwater System

To supplement its surface water supply, CWD operates eight groundwater wells. Four of the wells are active, one is inactive, one is on standby, and two are to be decommissioned (CWD 2016). The four active wells and standby well have a combined pumping capacity of 6,550 gpm (CWD 2016). Between 2005 and 2010, CWD relied on groundwater for about 15-30 percent of its total annual water supply.

2.8.11. Sacramento Suburban Water District

SSWD is located in northern Sacramento County, purchases surface water from adjacent agencies, and relies on groundwater to meet its full demand. SSWD's water system is divided into two parts: (1) North Service Area (NSA) for the areas of the former Northridge Water District, the former McClellan Air Force Base (now McClellan Park), Arbors at Antelope, and the North Highlands service area of the former Arcade Water District; and (2) South Service Area (SSA) for the Town and Country service area of the former Arcade Water District. Between the NSA and the SSA, there are 49 interconnections with adjacent agencies. Both the NSA and SSA are discussed separately below.

2.8.11.1. North Service Area Water System

The NSA distribution system consists of three pressure zones. To serve these zones there are six storage tanks in addition to groundwater pumping stations.

To deliver surface water to the NSA, SSWD uses SJWD's diversion and treatment facilities. The NSA system has two primary transmission mains that are part of the ATP. The primary east-west link of the ATP consists of about 40,000 feet of 48-inch-diameter pipe located mostly within Antelope Road. A 30-inch-diameter, 4,000-foot-long section of the ATP paralleling Interstate 80 conveys surface water to the southeastern portion of the NSA.

There are nine connections or turnouts in the NSA off of the ATP. These turnouts range in size from 12 inches to 30 inches in diameter. (There are four other turnouts: three for CHWD and one for CWD.)

2.8.11.2. North Service Area Groundwater System

The NSA contains 31 active wells with a combined pumping capacity of 37,550 gpm. The groundwater production system is designed to provide 100 percent of the system demand. There are six wells in stand-by, two wells pending inactivation, and one well is under construction.

2.8.11.3. South Service Area Water System

The SSA includes the town and country area of the former Arcade Water District, served as one pressure zone. The SSA distribution system includes one 5 MG capacity groundwater storage reservoir and a 14,000 gpm pump station completed in 2006. Distribution piping in the SSA ranges from 4 inches to 12 inches in diameter.

2.8.11.4. South Service Area Groundwater System

The SSA contains 40 active wells with a combined pumping capacity of 44,000 gpm. Like the NSA groundwater system, the SSA system is designed to provide 100 percent of the system demand. There is currently one well in stand-by, and one well is under construction.

2.8.12. Del Paso Manor Water District

Del Paso Manor is a small public water system nearly encompassed by SSWD in its South Service Area Water System. Del Paso Manor serves water to approximately 4,500 customers using eight groundwater wells and surface water. Total groundwater production reported in 2010 was 1,409 acre-feet.

2.8.13. Golden State Water Company

GSWC is a subsidiary of the American States Water Company that serves communities throughout California. In the Region, GSWC provides surface water and groundwater to over 16,000 people of the Arden Cordova Service Area. The Arden area is located south of SSWD, north of the lower American River, and is supplied entirely by groundwater. The Cordova area is located south of the lower American River, across from CWD and FOWD, and is supplied by a mixture of surface water and groundwater. This subsection describes GSWC's surface water and groundwater systems.

2.8.13.1. Golden State Water Company Surface Water System

Surface water is supplied to the Cordova System from the Coloma WTP, Pyrites WTP, and CWD's Bajamont WTP. The Coloma WTP and Pyrites WTP treat water pumped from the Folsom South Canal, which is gravity fed from Lake Natoma at Nimbus Dam. The Folsom South Canal is part of CVP and is operated and maintained by Reclamation. There is a 24-inch transmission main that crosses under the American River conveying 4.5 mgd of treated surface water on a continuous basis from the Bajamont WTP to the Cordova System. The Arden and Cordova systems combined comprise over 20 miles of 2- to 6-inch-diameter distribution pipeline, and over 95 miles of 8- to 24-inch-diameter pipeline. The Cordova System has two 6-inch interconnections and one 12-inch interconnection with Cal-Am, two 12-inch interconnections with SCWA, two 12-inch connection with Folsom, and six reservoirs for a total storage capacity of 14.5 MG. There are currently no connections between the Arden and Cordova systems without wheeling through other agencies.

2.8.13.2. Golden State Water Company Groundwater System

The Arden system is supplied by five wells which served just over 850 AFY in 2017. The Cordova system is supplied by eight active wells with capacity of just over 20,000 acre-feet (AFY) to supplement surface water from the three WTPs. Groundwater is estimated to account for about 30 percent of Cordova's water supply. All active wells have disinfection and there is one inactive well in the Cordova system.

2.8.14. Rio Linda/Elverta Community Water District

Rio Linda/Elverta Community Water District (RLECWD) is located west of SSWD, at the northern border of Sacramento County. It currently supplies only groundwater to its service area, although water can be purchased from SSWD through an interconnection during emergencies. Discussions for potential

conjunctive use with other agencies are ongoing with neighboring districts. The subsection describes the existing water and groundwater systems.

2.8.14.1. Rio Linda/Elverta Community Water District Water System

RLECWD does not currently use surface water on a regular basis, and has an intertie with SSWD for emergency purposes. SSWD supply through the intertie is a mix of surface and groundwater, with a design capacity of 2,500 gpm.

2.8.14.2. Rio Linda/Elverta Community Water District Groundwater System

About half of RLECWD's area is currently served by private wells; the remainder is served by RLECWD groundwater distribution facilities. RLECWD's groundwater system consists of 12 production wells. The older production wells are more than 25 years old and typically produce 350 to 950 gpm of good quality water, whereas the well-constructed in 2012 produces 2,100 gpm. RLECWD's recently reactivated well can produce 600 gpm. To increase future water supplies, RLECWD has plans to replace older wells affected by hexavalent chromium by constructing two additional groundwater wells. Some of the existing wells have disinfection treatment. The only well that does not have disinfection treatment is rarely used due to high iron and manganese levels. RLECWD's water system consists of a network of 12-inch-diameter and smaller pipelines to convey water to customers. There is a 0.1 MG elevated water tank that provides system storage.

2.8.15. Natomas Central Mutual Water Company

Natomas Central Mutual Water Company (NCMWC) is a private, not-for-profit corporation formed to serve some 280 member/shareholders in northwest Sacramento County and southwest Sutter County. NCMWC serves more than 33,200 acres and has water rights for up to 120 TAF per year from Reclamation. NCMWC's distribution system includes pipelines, pumps, and more than 50 miles of canals (NCMWC 2013).

2.8.16. City of Sacramento

The City of Sacramento currently provides surface water and groundwater to wholesale and retail customers within its city limits and the American River Place of Use (POU), a contiguous area of 63,182 acres. Sacramento is self-sufficient regarding its water supply system, with legal and infrastructural access to water from both the American and Sacramento rivers. The City of Sacramento is also responsible for the collection of wastewater and delivery to SRCSD. This subsection describes the City of Sacramento's water, groundwater, and wastewater collection systems.

2.8.16.1. City of Sacramento Water System

The City of Sacramento owns and operates two WTPs. The Fairbairn WTP is located on the south side of American River about 7 miles upstream from the confluence with the Sacramento River. The Fairbairn WTP intake has a diversion screen capacity of 200 MGD, but the permitted treatment capacity is 160 MGD. Additional regulatory constraints ("Hodge Decision") governing diversions on the lower American river will often limit the diversion rates between 64 MGD and 100 MGD. The Sacramento River WTP, located on the east bank of Sacramento River below the confluence with the American River, has a design capacity of 160 MGD during the summer. Permits condition limits the facility during the winter to 120 MGD.

The City of Sacramento provides water to two pressure zones within its city limits. The larger pressure zone encompasses the majority of the city, with a smaller pressure zone in the northeastern part of the city. High lift pump stations are operated at the Sacramento River WTP and Fairbairn WTP to serve the two pressure zones. Ten smaller pump stations are operated at storage facilities throughout the city. The City of Sacramento currently maintains approximately 1,600 miles of transmission and distribution system mains that have a diameter range of 2 to 72 inches, where only 360 miles of the pipeline have diameter range of 12 inches or larger. In addition, the City of Sacramento maintains 17 storage facilities, with 12 being storage reservoirs, and 5 as finished water clearwells at the 2 WTPs. Each storage reservoir in the distribution system contains a storage capacity of 3 MG with the exception of the Florin Reservoir that contains a storage capacity of 15 MG. In the southern part of the City of Sacramento, a new distribution tank is under construction that will contain a storage capacity of 4 MG and two new groundwater wells. The total distribution storage will be 52 MG when the 4 MG "Shasta Park" storage facility is completed in 2018. The total clearwell capacity from both water treatment plants provide an additional 45 MG.

2.8.16.2. City of Sacramento Groundwater System

In addition to surface water supply, the City of Sacramento currently operates 32 active municipal groundwater supply wells, with 30 of these wells located within the city limits north of the American River, and the remaining two wells located south of the American River. The total capacity of the well pumping facilities is about 23 MGD (Personal Communication, B. Ewart, 2018). The City of Sacramento is in the process of completing a well rehabilitation program which will improve the existing well capacity through a variety of projects. During this project it was discovered that the existing wells will required new pump-to-waste improvements for flexible operations upon well startup. The City is currently identifying candidate wells and developing cost estimates to plan for this potential future project (Personal Communication, B. Ewart, 2018). Recently, a new well was constructed at Shasta Park with another well under construction at the Fairbairn WTP. Due to water quality results at the Fairbairn WTP Well site, equipping of the well was put on hold, and a second well at Shasta Park is currently under construction. Together, the two new wells

will begin to provide approximately 7 MGD of potable water, starting in 2018. The anticipated groundwater pumping capacity is expected to be approximately 25 to 30 MGD after the new wells are constructed and the rehabilitation project is completed.

2.8.16.3. City of Sacramento Wastewater System

Wastewater collection in the City of Sacramento is provided by both the city and the Sacramento Area Sewer District (SASD). SASD maintains approximately 35 percent of the public collection system within the city limits, primarily in the northwest and southeast sections of the city. The City of Sacramento's Department of Utilities maintains the remaining portion of the public collection system, which includes a combined sewer system in the older central city area with a total service area of approximately 7,545 acres and approximately 305 miles of 4- to 120-inch-diameter pipes. The separated sewer system is located primarily in the northeast, east, and southwest sections of the city with a total service area of about 25,435 acres. Wastewater conveyed by the city's separated sewer system, as well as unincorporated areas in Sacramento County and the cities of West Sacramento and Folsom, and is routed to SRCSD's SRWWTP for treatment and disposal via an interceptor system consisting of large-diameter pipes and pump stations (Sacramento 2015a).

2.8.17. El Dorado Irrigation District

EID supplies surface water and recycled water to customers in its service area which spans an area of 220 square miles, primarily located in the South Fork American River and North Fork Cosumnes River watersheds. EID provides water to more than 100,000 people for municipal, industrial, and irrigation uses. The portion of EID in the Region is the downstream and western portion of the larger EID service area. This subsection focuses on the El Dorado Hills area, unless otherwise noted and describes the water, wastewater, and recycled water systems and planned facilities.

2.8.17.1. El Dorado Irrigation District Water System

The EID water transmission system is comprised of three, interconnected subsystems; each subsystem is identified by its water supply source. The El Dorado Forebay and Jenkinson Lake subsystems are outside the Region, but the Folsom Reservoir subsystem supplies the western portion of El Dorado County, which is within the Region. Water is pumped from Folsom Reservoir to the El Dorado Hills WTP (26 MGD). Treated water is conveyed through distribution mains using two pump stations that supply two primary pressure zones (960 Zone and 820 Zone) and several storage tanks (EID 2013).

2.8.17.2. EID Wastewater and Recycled Water Systems

EID's three largest wastewater service areas (El Dorado Hills, Deer Creek, and Mother Lode) are served by a series of lift stations, force mains, and gravity mains that convey sewage to either the El Dorado Hills

WWTP or Deer Creek WWTP. EID operates and maintains a sanitary sewer system serving a population of approximately 62,000 people with over 77 square miles of service area. The system has 388 miles of gravity collection system, 59 miles of force mains, 8,204 maintenance holes, 21,662 sewer service laterals, and 61 lift stations. The El Dorado Hills WWTP has a rated ADWF capacity of 4.0 MGD, and the Deer Creek WWTP has a rated ADWF capacity of 3.6 MGD (EID 2016b).

EID operates two interconnected recycled water systems. Approximately 65 percent of the treated effluent produced at the El Dorado Hills WWTP is reclaimed, and approximately 35 percent is reclaimed at the Deer Creek WWTP. While the Deer Creek WWTP is located outside the Region, an 18-inch-diameter pipeline connects the El Dorado Hills and Deer Creek systems. EID typically discharges 1 MGD of treated effluent to Deer Creek to maintain downstream riparian habitat and provide water for beneficial uses. Disinfected, tertiary quality recycled water produced at these two facilities are distributed for irrigation of residential landscape, commercial landscape, and recreational turf. Recycled water is also used in a few areas for fire suppression and dust control. The peak capacity of the recycled water system is approximately 5.1 MGD. Since recycled water demands currently exceed recycled water supplies, the deficit is supplemented by potable water. EID plans to expand its recycled water operations as daily wastewater flows increase and to explore options for additional recycled water storage (EID 2013).

2.8.18. City of Folsom

Folsom is located south of and adjacent to Folsom Reservoir. Folsom currently supplies surface water almost entirely to its service area. Groundwater is only used on a limited basis for golf course irrigation and as an emergency supply for Intel Corporation. This subsection includes a description of the surface water distribution system, the groundwater system, and the wastewater system operated by Folsom.

2.8.18.1. City of Folsom Water System

Folsom supplies surface water to seven pressure zones within its city limits, and to one pressure zone that extends slightly beyond city limits to the southwest. The eight pressure zones are organized into six service areas – Folsom Service Area West, Folsom Service Area East, Folsom Plan Area, Nimbus Area, Ashland Area, and American River Canyon Area (M. Yasutake, personal communication, 2018). The Ashland Area and American River Canyon area are served by SJWD's Sidney N. Peterson WTP. While SJWD provides water supplies to both of these service areas, Folsom retails the SJWD wholesale water to its customers in the Ashland Service Area, while SJWD retails to Folsom's customers in American River Canyon (Folsom 2016).

Folsom receives surface water from Folsom Reservoir and treats raw water at the 50 MGD Folsom WTP. Drinking water is supplied through approximately 308 miles of pipeline to approximately 20,650 service

connections (M. Yasutake, personal communication, 2018). Folsom's water system also includes 12 storage tanks with a total capacity of 34.5 MG. Reservoirs 1 and 2 at the WTP have a capacity of 3 and 4 MG, respectively. Eight other storage tanks with capacities ranging from 1.5 MG to 4 MG are located throughout the distribution system, and seven booster pump stations pump water to the eight pressure zones (M. Yasutake, personal communication, 2018).

Folsom has two system interconnections: (1) an emergency connection to the Ashland District across the Rainbow Bridge, and (2) an interconnection with GSWC. Both interconnections are normally closed (Montgomery Watson, 1998).

2.8.18.2. City of Folsom Groundwater System

Groundwater use in Folsom is limited to private use by the Empire Ranch Golf Course and as an emergency supply for Intel Corporation. Intel Corporation uses two emergency backup wells, with 100 and 15 gpm capacities, respectively (Folsom 2016).

2.8.18.3. City of Folsom Wastewater System

Folsom operates and maintains 275 miles of gravity sewer lines, 3 miles of force mains, 96 miles of lower sewer laterals, and 14 active pump/lift stations (M. Yasutake, personal communication, 2018). Folsom's primary wastewater customers are residential, industrial, and commercial customers with most wastewater generated from residential users. Folsom conveys this wastewater to the SRCSD system where it is treated at the SRCSD Wastewater Reclamation Facility (Folsom 2017a).

2.8.19. Sacramento County Water Agency

SCWA provides retail water supply to portions of unincorporated Sacramento County, and the cities of Rancho Cordova and Elk Grove. SCWA also provides wholesale water supply to a portion of the service area of EGWD. It is anticipated that SCWA will also provide wholesale water supply in the future to Cal-Am's service area in Rio del Oro. Elk Grove Water District (EGWD) operates a retail water system serving customers in a portion of the City of Elk Grove (SCWA 2016a).

SCWA supplies a combination of surface water, groundwater, and recycled water to eight main service areas. The combined Mather Sunrise and Laguna Vineyard public water systems are known as Zone 40. The Mather Sunrise system consists of the Zone 40 NSA. The Laguna Vineyard water system consists of both the Zone 40 Central Service Area (CSA) and SSA (SCWA 2016a). The other service areas include: Arden Park Vista, East Walnut Grove, Hood, Northgate 880, Southwest Tract, and the Metro Air Park (SCWA 2016a). This subsection describes the water and groundwater systems. SCWA's recycled water system is operated (by agreement) in collaboration with SRCSD, which is described in **Section 2.8.29**.

2.8.19.1. Sacramento County Water Agency Water System

The SCWA water system has a total storage capacity of 31 MG and 10 pump stations. SCWA also maintains over 70 miles of transmission mains of 16 inches to 48 inches in diameter. SCWA's water system includes the Vineyard WTP, 12 groundwater treatment plants (GWTP), direct feed wells, storage facilities, and the Franklin Intertie. The current capacity of the Vineyard WTP is 50 mgd, with an ultimate capacity of 100 mgd (SCWA 2016b). The City of Sacramento also treats a portion of SCWA's surface water at its Sacramento River WTP, and then wheels that water through its distribution system to the Franklin intertie (SCWA 2016b). The Franklin Intertie has a capacity of 11.1 mgd.

Tertiary treated wastewater is supplied from SRCSD's Water Reclamation Facility to a part of SCWA's Laguna Vineyard system. The 5 MGD Water Reclamation Facility is located at the SRWWTP Plant site. SCWA owns and maintains the recycled water distribution system. This program is called the Phase I SRCSD/SCWA Water Recycling Pilot Program (WRPP) (SCWA 2016a).

2.8.19.2. Sacramento County Water Agency Groundwater System

SCWA service areas are generally dependent on groundwater supplies. The Arden Park Vista, Northgate 880, Hood, East Walnut Grove, and Mather Sunrise water systems are completely reliant on groundwater. Groundwater is supplied by SCWA's system of groundwater wells and as remediated groundwater that is extracted by others. SCWA has a combination of direct-feed wells and groundwater treatment facilities where needed.

GWTPs maintained by SCWA include the Anatolia GWTP, Mather Housing GWTP, Calvine Meadows GWTP, East Park GWTP, East Elk Grove GWTP, Wildhawk GWTP, Waterman GWTP, Big Horn GWTP, Dwight Road GWTP, Lakeside GWTP, and Poppy Ridge GWTP (SCWA 2016a).

Typical municipal capital facilities for groundwater production include groundwater extraction wells (including raw water piping from the wells to the treatment plant), treatment, at grade storage tanks, booster pumps, and transmission pipelines to the distribution system. Treatment plants typically remove iron, manganese, and in some cases arsenic. SCWA also has a remediated groundwater supply of 8,900 AFY through an agreement with Sacramento County and Aerojet-General Corporation (SCWA 2016b). The remediated groundwater is pumped from the northern portion of the South American Subbasin and discharged into the American River from Aerojet's Groundwater Extractions and Treatment facilities, located in Rancho Cordova.

2.8.20. Elk Grove Water District

EGWD serves more than 42,000 people in an area of approximately 13 square miles in southern Sacramento County. Surrounded on all sides by SCWA, EGWD provides treated water from SCWA to their Service Area No. 2 customers and groundwater to its Service Area No. 1 customers.

2.8.20.1. Elk Grove Water District Water System

EGWD supplies a mix of surface water and groundwater to Service Area No. 2, and EGWD is responsible for the maintenance and operation of the distribution mains. SCWA wholesales the water to EGWD, and EGWD owns and operates one WTP, the East Elk Grove Groundwater Treatment Plant, which is located in the service area.

2.8.20.2. Elk Grove Water District Groundwater System

In Service Area No. 1, EGWD owns and operates groundwater wells and the Railroad Street Treatment and Storage Facility. This facility includes the groundwater treatment plant, two aboveground storage tanks, production wells, and multiple pipe distribution systems. The facility contains a maximum capacity of 10.4 MGD that can pump up to 16,000 gpm (EGWD 2016). After the Recently refurbished Hampton Village WTP supplies an additional 1,000 gpm of water to EGWD (EGWD 2017).

2.8.21. Fruitridge Vista Water Company

FVWC relies almost entirely on groundwater to serve an area of 4 square miles south of the City of Sacramento along State Route 99. The service area to the east of State Route 99 is primarily residential, but contains some commercial areas and three schools. The service area to the west of State Route 99 is primarily commercial, but contains some residential and commercial areas in addition to two schools. FVWC considers its service area to be 95 percent built-out, except for the south and southeast areas.

FVWC operates 16 groundwater wells, which have been sufficient to meet past water demands. FVWC has taken four wells out of production due to methyl tertiary-butyl ether and PCE contamination, and replaced this loss in supply with three new wells and two new permanent interties with the City of Sacramento. Additionally, FVWC has six emergency interties with both the City of Sacramento and Cal-Am.

2.8.22. Tokay Park Water Company

Tokay Park Water Company is a small water district serving an area of under 2 square miles southeast of FVWC. Service is provided to approximately 199 primarily residential connections. Supply is from groundwater wells. Estimated demand is 142 AFY (Sacramento Local Agency Formation Commission 2013).

2.8.23. Florin County Water District

Florin County Water District is a small water district serving an area of approximately 2.5 square miles east of Tokay Park Water Company. Service is to approximately 12,588 customers through 2,213 connections. Supply is from 10 groundwater wells. Estimated demand is 2,668 AFY (Sacramento Local Agency Formation Commission 2013).

2.8.24. Rancho Murieta Community Services District

Rancho Murieta is located in southeastern Sacramento County along the Cosumnes River. Rancho Murieta uses surface water and recycled water in its service area, although access to groundwater is an option being considered to diversify its water supply portfolio in dry years. Surface water storage and increased recycled water capacity are also being studied.

2.8.24.1. Rancho Murieta Community District Water System

Rancho Murieta's water supply stems from Granlees Dam on the Cosumnes River. Raw water is distributed by booster pumps and pipelines to three primary reservoirs (Calero, Chesbro, and Clementia) with a combined usable storage of 4,608 AF. Rancho Murieta has two WTPs with a combined capacity of 3.5 MGD, and both plants have plans for expansion if needed for a total capacity of 6.0 MGD.

2.8.24.2. Rancho Murieta Community Services District Wastewater and Recycled Water Systems

Rancho Murieta Wastewater Reclamation Plant (WWRP) serves the entire Rancho Murieta community, producing 537 AFY of treated effluent. The collection system consists of gravity sewer lines with three lift stations. The WWRP has secondary and tertiary treatment systems, with a design flow of 1.55 MGD and design capacity of 3.0 MGD, respectively (CVRWQCB 2014).

Rancho Murieta treats all of its wastewater to Title 22 standards and distributes recycled water to irrigate golf courses, which have a normal year water demand of 550 AFY. Rancho Murieta's WWRP stores secondary wastewater in two large reservoirs, and then applies tertiary treatment during the irrigation season from April to November.

2.8.25. City of Galt

Located approximately 20 miles south of the City of Sacramento, Galt serves an area of 3,815 acres. Of this total area, 58 percent is residential, 19 percent is commercial and light industry, and the remaining 23 percent are parks, open spaces, or mixed uses. Galt does not have access to surface water and relies on groundwater to meet water demands.

2.8.25.1. City of Galt Groundwater System

Galt owns and maintains over 99 miles of water lines ranging from 1 to 24 inches in diameter, eight active wells, four above ground water storage tanks, and five treatment plants. The Golden Heights WTP was updated in 2017. Industrial Park WTP will potentially be upgraded from 1,360 gpm to 4,160 gpm.

2.8.25.2. City of Galt Wastewater and Recycled Water System

Galt owns, maintains, and operates its own WWTP, gravity sewer pipelines and force mains, sewer lift stations, and pump stations. The city collects wastewater from residential, commercial, institutional, and industrial customers within the service area. The WWTP is permitted for 3.0 MGD and currently operates at approximately 2.2 MGD. Treated effluent is used for irrigation purposes and/or is discharged to Laguna Creek.

Galt's WWTP consists of secondary treatment, tertiary filtration, and ultraviolet (UV) disinfection, and connects to an effluent storage reservoir with a capacity of 70 MG. This WWTP has the capacity to produce recycled water, but currently, neither the necessary distribution infrastructure nor the demand exists for widespread use. However, Galt has identified potentially interested irrigation water customers. Galt applied 335 MG of recycled water in 2011 to an onsite agricultural reuse site to grow fodder crops.

2.8.26. Placer County

Placer County is responsible for providing wastewater services for the entire unincorporated area of Placer County (outside the cities of Lincoln, Roseville, and Auburn and the areas served by the South Placer Municipal Utility District). Placer County Environmental Engineering Division operates and maintains 10 separate sanitary sewer systems that are self-supporting and maintained through user fees.

Five of the 10 separate sewer systems are located in the Region. Sewer Maintenance District (SMD) 1 is located in North Auburn, and 102 miles of pipe carry wastewater to the North Auburn lift station, which is conveyed to the City of Lincoln Regional WWTP. SMD 2 in Granite Bay and County Service Area 28, SMD 3 in Horseshoe Bar/Folsom Reservoir, and Zone2A3 in Sunset Industrial Park consist of 118 miles, 16 miles, and 10 miles of sewer pipes, respectively. All three of these systems connect to Roseville's WWTPs for treatment. Zone 6 in Sheridan has 3 miles of pipeline and has its own WWTPs (R. Mahoney, personal communication, 2018).

Wastewater capital improvement projects are continuously identified and planned on facilities and pipes in all Placer County Districts and Central Service Areas (R. Mahoney, personal communication, 2018).

2.8.27. City of Auburn

Located in the northeastern corner of the Region, Auburn owns and operates its own wastewater treatment and collection system, which serves the city within its boundaries.

Auburn maintains over 85 miles of wastewater collection lines and 11 sewer lift stations throughout the city. This network of pipes collects sewage from residences and businesses and transports it to the Auburn WWTP located west of the city. The Auburn WWTP discharges its tertiary treated effluent into Auburn Ravine at a maximum permitted flow of 1.65 MGD. Auburn plans to upgrade its WWTP to improve performance and comply with NPDES permits. The WWTP upgrades include constructing a new oxidation ditch along with its associated facilities (Auburn 2017).

2.8.28. South Placer Municipal Utilities District

South Placer Municipal Utilities District (SPMUD) provides wastewater collection and conveyance services for the communities of Rocklin, Newcastle, Loomis, Penryn, and portions of Granite Bay (Loomis Basin Chamber 2013). SPMUD has a service area of 18,560 acres and approximately serves 29,000 dwelling units. The SPMUD system includes 247 miles of pipeline and eight pump stations, and the wastewater is conveyed to the Dry Creek Regional WWTP or the Pleasant Grove Regional WWTP, both operated and maintained by Roseville. Newcastle Sanitation District was annexed into SPMUD.

2.8.29. Sacramento Regional County Sanitation District

Formed in 1973, SRCSD (or Regional San) is the Sacramento region's wastewater conveyance and treatment utility, serving a population of more than 1.4 million. SRCSD treats wastewater from residential, commercial, and industrial customers in the cities of Citrus Heights, Elk Grove, Folsom, Rancho Cordova, Sacramento, and West Sacramento; unincorporated Sacramento County; and the communities of Courtland and Walnut Grove. After local collection, wastewater from these areas travel's through SRCSD's system, which includes approximately 169 miles of interceptor pipelines and 11 pump stations, until it reaches SRCSD's SRWWTP, the wastewater is currently treated to secondary treatment levels and is safely discharged to the Sacramento River, with the exception of a small amount that receives additional treatment at SRWTP's Water Reclamation Facility (WRF) to produce tertiary recycled water that is reused for non-potable purposes, such as irrigation and industrial uses. In normal weather years, SRCSD treats, on average, approximately 130 million gallons of wastewater each day.

Since 2003, SRCSD, in partnership with the SCWA, has been providing approximately 800 AFY of tertiary treated recycled water for landscape irrigation uses to the Laguna West, Lakeside, and Stonelakes communities located in Elk Grove. These communities are also referred as the Phase I recycled water

service area. In 2004, SRCSD approved a goal of increasing recycled water use in SRCSD's service area to 30 to 40 MGD by the year 2025.

In February 2007, SRCSD completed a Water Recycling Opportunities Study (WROS) that identified and prioritized, at a high level, 18 recycled water projects that could, collectively, enable SRCSD to meet its water recycling goal. The top three most promising projects identified in the WROS include the Phase II Expansion Project located in Elk Grove, City of Sacramento Recycled Water Projects, and the South Sacramento County Agriculture and Habitat Lands Recycled Water Project (South County Ag).

In December 2010, the CVRWQCB adopted a new NPDES permit for the SRWTP requiring ammonia removal and filtration. To comply with this NPDES permit, SRCSD is implementing the EchoWater Project at the SRWTP. Once completed in 2023, the EchoWater Project will reduce nearly 95 percent of the ammonia in the treated wastewater (recycled water) at SRWTP. It will also make most of the treated recycled water suitable for large-scale water recycling.

SRCSD, in partnership with the City of Sacramento and SMUD, is implementing the Sacramento Power Authority (SPA) Water Recycling Pipeline Project that will initially provide 1,000 AFY of tertiary treated recycled water for industrial cooling water at the SPA Cogeneration Plant, and eventually up to 1,700 AFY for irrigation in the southwest portion of the City of Sacramento. The Project will be implemented in multiple phases, with Phase 1 building the transmission pipeline to convey recycled water from SRWTP to the SPA Cogeneration Plant. The construction work associated with constructing the transmission pipeline is expected to be completed in 2018. Future expansion phases will build the distribution system to serve other recycled water users located in the City of Sacramento.

In addition, SRCSD, in collaboration with SCWA and Elk Grove, is planning to expand the use of recycled water in the communities of East Franklin and Laguna Ridge both located in Elk Grove. The estimated recycled water demand to serve these communities is about 2,300 AFY and recycled water service to this are anticipated to start after the EchoWater Project is completed in 2023.

South County Ag will deliver up to 50,000 acre-feet per year of tertiary treated recycled water to irrigate up to 16,000 acres of farmland and habitat lands located in south City of Sacramento. The recycled water will be available at the SRWTP in 2023 with the completion of the EchoWater Project. South County Ag is expected to be implemented in phases to facilitate design, permitting, construction, acquisition of State and federal funding, and development of user service agreements.

To facilitate the implementation of its water recycling projects, SRCSD continues to form partnerships and to pursue state and federal funding opportunities. At the state level, SRCSD continues to seek funding through the Proposition 1 Water Storage Investment Program, Clean Water State Revolving Fund, and state funding allocated to the local ARB IRWMP. At the federal level, SRCSD is pursuing funding through the WaterSMART and Title XVI funding programs sponsored by Reclamation.

2.9. Water Demands and Supplies

This subsection describes water demands and supplies in the Region. Because the Region is significantly urbanized, this subsection focuses on M&I water use. However, the Region has significant private agricultural water users that use a combination of seasonal surface water supplies and groundwater that is available year round. Some water agencies, such as PCWA (to its Zone 5 users), deliver water for larger scale irrigation uses. **Section 2.9.1** portrays historic and projected water demands in the Region, as well as ongoing demand reduction efforts. **Section 2.9.2** begins with a brief discussion regarding surface water rights and contracts in the Region. The subsection then explains restrictions on surface water availability, groundwater use patterns, and recycled water availability. The water supply picture is summarized with a description of the water agencies' current water supply portfolios and their projected future water supplies. This subsection concludes with an explanation of how these water demands and supplies interact and play a role in shaping future development in the Region.

Water demand and supply portfolios for RWA member agencies were developed as part of the North American Basin Regional Drought Contingency Plan (NAB RDCP). The NAB RDCP was a planning effort to explore opportunities to collaborate and cooperate to enhance regional reliability, and to increase the resiliency of the Region's water resources in the face of future climate and drought conditions. The effort was cost-shared by Reclamation through Reclamation's WaterSMART Drought Response Program.

To develop the portfolios, information was gathered from state, local, and regional planning documents, including 2015 UWMPs, Master Plans, General Plans, and capital improvement programs. An initial water budget and vulnerability analysis for each agency was developed to highlight demand variability throughout the course of year, and variability of supplies across different hydrological conditions per the WFA water year types. This information was compiled into draft water supply portfolios, which were sent to each agency for review. Interviews were conducted to confirm accuracy and completeness of information presented in the water supply portfolios, fill data gaps, and identify vulnerabilities and opportunities. Finally, the water budget for each agency was updated using the information from the interviews. The water agency demand and supply portfolios included information on: current and projected demands, estimate of

conservation potential, available supply sources, surface water rights and contract entitlements, groundwater production capacity, and recycled water.

Water supply portfolios for agencies not included in the NAB RDCP were developed for use in the Regional Water Reliability Plan (RWRP) evaluation. The RWRP is an RWA-led planning effort to achieve long-term water supply reliability by investigating and identifying potential coordinated and collaborative actions among the region's water agencies. Water supply portfolios for agencies not included in either the NAB RDCP or RWRP were updated using information from regional and agency-specific plans, such as UWMPs, Master Plans, and water supply assessments. **Figure 2-31** shows the water agencies involved in the NAB RDCP. In **Figure 2-31** the 5 agencies that partnered as leads for development of the RDCP, also part of the RWRP, are identified as RDCP Partner Agencies. The other agencies that participated in the RDCP, also part of the RWRP, are identified as RDCP Participating Agencies. Agencies that are only part of RWRP are identified as Other Participating Regional Agencies. **Figure 2-32** shows all of the water agencies involved in the RWRP. Of the agencies depicted in **Figure 2-32**, all had an updated water supply portfolio completed with the exception of NCMWC and EDCWA.

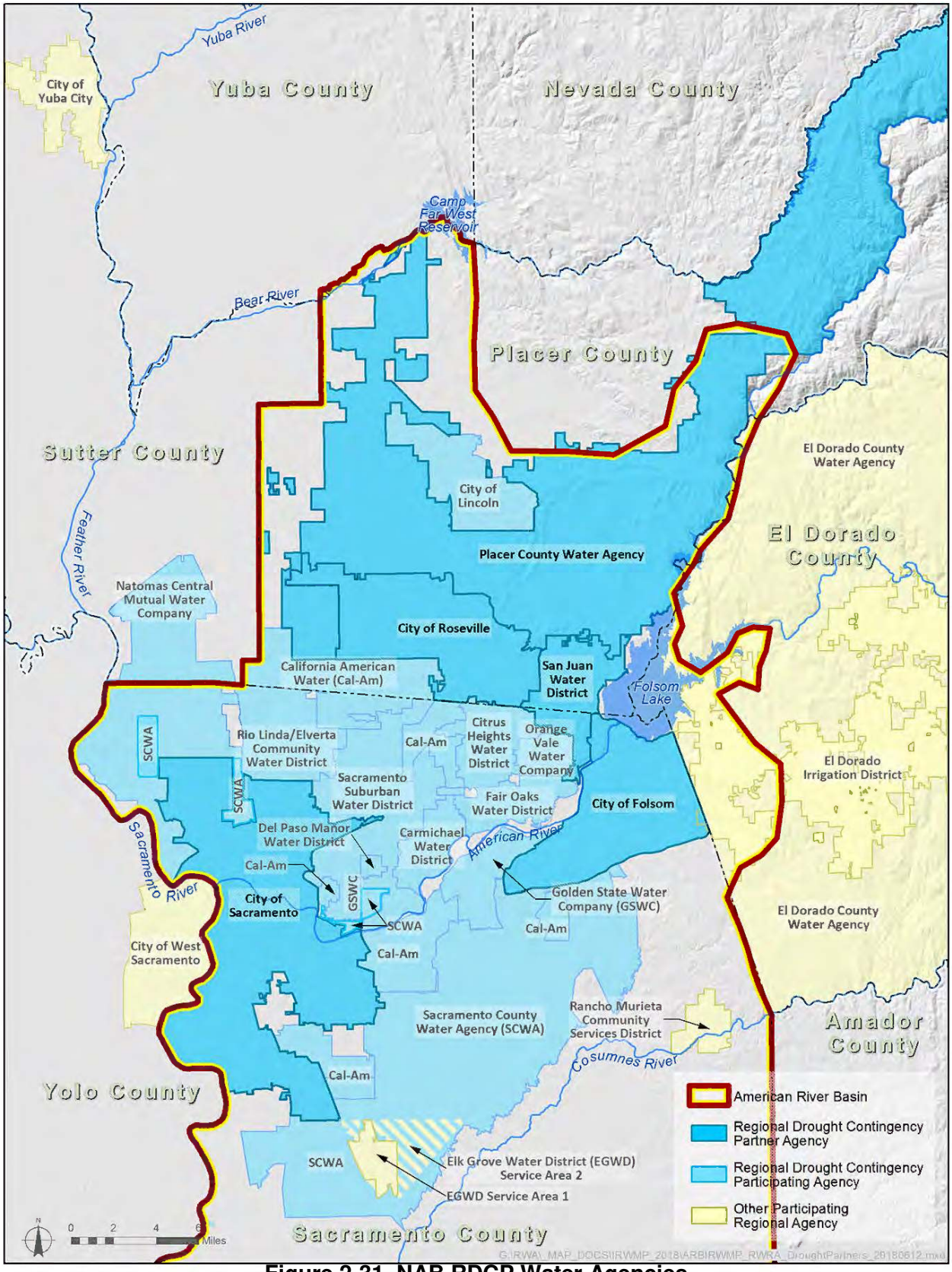


Figure 2-31. NAB RDCP Water Agencies

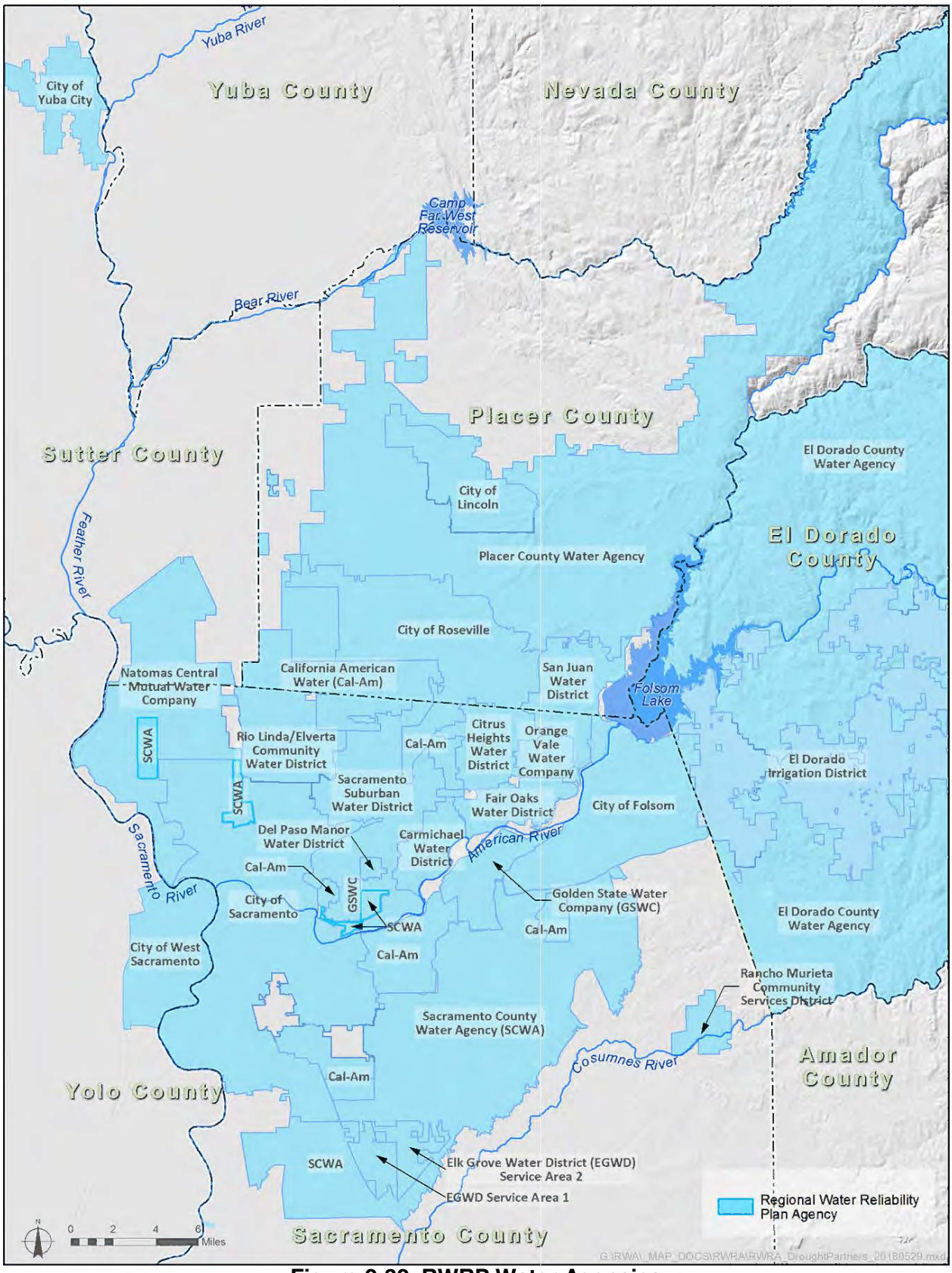


Figure 2-32. RWRP Water Agencies

2.9.1. Water Demands

Current and projected water demands help determine anticipated future water supply needs. Water demand is dependent on numerous factors, such as population, land use, season, efficiency of the distribution system, and water user efficiency. As M&I water demands vary hourly, within a single day, and seasonally, demands are typically normalized for general discussion purposes. Residential water demands typically peak in the morning and early evening, corresponding to when residents wake up and return home. Seasonally, summer has a higher water demand than winter due to outdoor irrigation. With the Sacramento region's hot, dry climate and long summer season, more than 65 percent of a household's yearly water consumption is typically landscape irrigation (Sacramento 2016a). The following subsections discuss historic and projected water demands annually, as well as demand management efforts in the Region.

2.9.1.1. Historical Water Demands

Recent historical water demands in the Region are provided in **Table 2-20**. These demand reports include system losses, but do not include wholesale deliveries to other agencies. Historically, water demands in the Region increased with population growth. In 1992, the Energy Policy Act was passed, which created mandates, established goals, and reformed utility laws with the aim of improving energy efficiency and promoting the use of clean energy in the United States. As a result, local and regional water efficiency programs, increased public outreach and continued with the installation of water meters to allow volumetric billing. Since the passage of the act, the Region has experienced a decreasing trend in water demand, especially in the last decade.

For example, water demands in the Region decreased from about 854,292 AFY in 2005 to 782,818 AFY in 2010. More recently, water demands in the Region continued to decrease from 2010 to 678,000 AFY in 2015. The significant reduction in demand can be attributed to the demand drivers listed above as well as the state-issued mandatory water conservation emergency drought restrictions in place during 2015. As the state and Region emerged from the peak of the drought in 2015, water demand in the Region has recovered during 2016 and 2017.

Table 2-20. Estimated Recent Historical Water Demands (AFY)

Water Agency	2005	2010	2015
California American Water	44,970	37,297	28,421
Carmichael Water District	12,496 [1]	9,732	7,142
Citrus Heights Water District	19,034	13,725	9,974
Del Paso Manor Water District	1,657	1,409	1,052
El Dorado Irrigation District	37,223	32,525	30,167
Elk Grove Water District	7,915	6,720	5,311
Fair Oaks Water District	12,454	11,800	8,130
Florin County Water District	2,668	2,668	2,668
City of Folsom	24,974	26,243	18,587
Fruitridge Vista Water Company	4,891	4,157	3,596
City of Galt	5,300	5,174	4,163
Golden State Water Company [2]	18,098	16,478	11,593
City of Lincoln	9,376 [3]	9,203	7,629
Natomas Central Mutual Water Company	37,332	23,438	23,438[7]
Orange Vale Water Company	4,915	4,585	3,256
Placer County - Ag/Ag-Res	56,300	58,300	58,300[7]
Placer County Water Agency, Zone 1 TW [4]	36,253	35,608	29,675
Placer County Water Agency, RW Deliveries[4]	54,505	52,990	43,912
Placer County Water Agency, Z5 Deliveries[4]	11,808	12,240	10,137
Rancho Murieta Community Services District	2,008	1,710	1,711
Rio Linda/Elverta Community Water District	3,400	2,720	2,109
City of Roseville [5]	31,075	28,633	22,881
City of Sacramento	131,564	108,276	84,832
Sacramento County – Ag/Ag-Res [6]	192,500	192,500	192,500
Sacramento County Water Agency	35,971	35,509	29,149
Sacramento Suburban Water District	41,193	36,386	27,502
San Juan Water District[8]	14,270	12,650	9,666
Tokay Park Water District	142	142	142
Regional Total	**854,292**	**782,818**	**678,000**

Sources:
Rio Linda/Elverta Community Water District data were provided in the 2015 Public Draft UWMP. City of Galt data were provided in the 2015 UWMP. Rancho Murieta Community Services District's information is from its 2006 and 2010 Integrated Water Master Plan and 2016 Water Supply Assessment – Ranch Murieta North Project. Florin County and Tokay Park Water District data are estimates from Sacramento County Local Agency Formation Commission, as other data are not available. Placer County Ag/Ag-Res data are from 2013 Draft Western Placer County Sustainable Yield. Sacramento County Ag/Ag-Res data are estimated from the SacIRWM.
All other information was taken from the 2015 UWMP of each water agency.
Notes:
[1] 2005 Carmichael Water District demand is for 2006 (CWD 2011).
[2] Golden State Water Company includes Cordova System only.
[3] 2005 City of Lincoln demand is for 1996 (Lincoln, 2003) and 2006 (Lincoln, 2010).
[4] PCWA resides over two IWRMP regions, the ARB and CABY regions. PCWA's Zone 1 region is within the ARB Region. Recycled water deliveries are exclusive of Zone 5 deliveries and any Middle Fork Project water not utilized in Zone 1. Historical consumption of PCWA's various zones are provided (B. Rickards, personal communication, 2018).
[5] City of Roseville also provides raw surface water to Linda Creek for to sustain the natural flow for environmental purposes. The water usages for the years above are: 27.77 MG for 2005, and 73.1 MG for 2010.
[6] Sacramento County Ag/Ag-Res data theoretically include water use by Clay Water District, Galt Irrigation District, Omochumne-Hartnell Water District, and South Sutter WD.
[7] 2015 historical water demands were not available, assumed 2010 historical water demands.
[8] Values are for the San Juan Water District retail service area only.
Key:
AFY = acre-feet per year
Ag/Ag Res = agriculture/ agricultural-residential
ARB = American River Basin
CABY = Cosumnes American Bear Yuba
IRWMP = Integrated Regional Water Management Plan
PCWA = Placer County Water Agency
SacIRWM = Sacramento Area Integrated Water Resources Model
UWMP = Urban Water Management Plan
WD = water district

2.9.1.2. Projected Water Demands

In UWMPs, each water agency estimated its future water demands based on a minimum of land-use and population projections through 2035 (**Table 2-21**). Anticipated effects of climate change are separately discussed in **Section 2.10**. If a water agency contracts its water to another agency, that demand is shown under the retailing agency using the water, and not under the agency that sold the water. Demand projections to at least 2040, providing a 20-year planning horizon, will be available in the next round of UWMP updates in 2020. From 2020 to 2035, the Region is expecting an increase in overall water demands due to growth[8].

Table 2-21. Projected Annual Water Demands (AFY)

Water Agency	2020	2025	2030	2035
California American Water	40,742	43,587	46,946	50,989
Carmichael Water District	10,374	10,300	10,226	10,151
Citrus Heights Water District	16,970	17,383	17,797	18,210
Del Paso Manor Water District 1	1,600	1,600	1,600	1,600
El Dorado Irrigation District	43,477	46,833	50,696	53,128
Elk Grove Water District	7,694	7,917	7,972	8,038
Fair Oaks Water District	11,768	12,080	12,398	12,726
Florin County Water District 1	2,668	2,668	2,668	2,6682
City of Folsom	25,575	27,685	28,527	29,283
Fruitridge Vista Water Company	6,609	6,609	6,609	6,609
City of Galt	5,858	6,405	7,072	7,808
Golden State Water Company	17,342	17,697	18,312	18,968
City of Lincoln	12,291	13,478	15,296	17,113
Natomas Central Mutual Water Company	29,000	23,000	23,000	23,0002
Orange Vale Water Company	4,567	4,686	4,860	4,981
Placer County – Ag/Ag-Res	75,600	74,300	73,100	71,800
Placer County Water Agency	28,600	32,800	37,600	42,500
Rancho Murieta Community Services District	2,041	2,532	2,854	3,428
Rio Linda/Elverta Community Water District	4,846	5,681	6,650	7,462
City of Roseville	41,054	43,300	46,074	48,762
City of Sacramento	122,229	129,548	138,882	148,213

[8] Due to the 2012-2016 California drought and the resulting water use efficiency that resulted, the projected annual water demands reported for the year 2015 are expected to differ significantly from what is to be reported in 2020 UWMPs.

Table 2-21. Projected Annual Water Demands (AFY) (contd.)

Water Agency	2020	2025	2030	2035
Sacramento County – Ag/Ag-Res	174,400	165,350	156,300	156,300[2]
Sacramento County Water Agency	48,121	55,489	63,288	71,145
Sacramento Suburban Water District	40,004	40,910	41,345	41,340
San Juan Water District[3]	15,855	16,773	17,624	18,509
Tokay Park Water District [1]	142	142	142	142
Regional Total	**789,427**	**808,753**	**837,383**	**913,289**

Notes:
Rio Linda/Elverta Water District data were provided in the 2015 UWMP. City of Galt data were provided in the 2015 UWMP. Rancho Murieta Community Services District's information is from its 2016 Water Supply Assessment – Ranch Murieta North Project. Placer County Ag/Ag-Res data are from 2013 Draft Western Placer County Sustainable Yield. Sacramento County Ag/Ag-Res data are estimated from the SacIRWM. Del Paso Manor Water District data were provided by personal communication with D. Sedwick, 2018. All other information was taken from the 2015 UWMP of each water agency or personal communication is agency staff.
[1] Growth is not expected for these water agencies.
[2] 2035 projected water demands are not available, 2030 projected water demands were assumed.
[3] Values are for the San Juan Water District retail service area only.
Key:
AFY = acre-feet per year
Ag/Ag Res = agriculture/ agricultural-residential
SacIRWM = Sacramento Area Integrated Water Resources Model
UWMP = Urban Water Management Plan

2.9.1.3. Demand Management

Demand management helps promote smart growth and smart water management in light of urban development and the associated increases in water demand. Increasing population, interest in reducing water waste, and uncertainties posed by climate change all result in a need for demand management. All water suppliers should have proactive demand management policies that include both conservation and efficiency. Conservation is generally viewed as a behavior or action that uses less water such as taking shorter showers. Conservation is the primary short-term demand management measure to reduce water use during times of water shortage like drought. Efficiency is generally viewed as a technology solution that uses less water to perform the same task such as replacing a high volume showerhead with a high efficiency model. Efficiency is the primary long-term demand management measure that water suppliers should always be implementing regardless of local water supply conditions.

The most recent drought highlighted the benefits of both long- and short-term demand management as well as the success that can be achieved from implementing demand management and the resulting water use reductions during periods of shortage. This subsection describes the water use targets each agency has set to meet the statewide goal of decreasing per capita water use 20 percent by the year 2020 and describes how those targets will be met. It also describes ongoing efforts to achieve long-term water efficiency, as outlined in the California Water Action Plan: "Make Conservation a California Way of Life." Effective demand management will increase regional water supply reliability (discussed in **Section 2.9.3**).

20 Percent Reduction by Year 2020

In February 2008, the Legislature directed state agencies to develop a plan to reduce statewide per capita urban water use by 20 percent by the year 2020. This marked the initiation of the 20x2020 Water Conservation Plan process. In which, all urban water suppliers had to plan for a 20 percent reduction in per capita water demand by 2020 and 10 percent by 2015. Calculation methodologies and targets were required and identified in water suppliers' 2015 UWMPs and are summarized in **Table 2-22**.

Table 2-22. Baseline and Target Demands (gallons per capita per day)

Water Agency	Baseline Demand	2015 Target	2015 Actual[2]	2020 Target
California American Water	216	195	130	173
Carmichael Water District	296	266	168	237
Citrus Heights Water District	286	257	137	229
El Dorado Irrigation District	301	271	187	241
Elk Grove Water District	239	215	111	191
Fair Oaks Water District	348	314	207	279
City of Folsom	440	396	261	352
Fruitridge Vista Water Company	154	117	117	123
City of Galt	217	196	158	174
Golden State Water Company	400	360	235[1]	320
City of Lincoln	241	217	149	193
Orange Vale Water Company	301	271	176	241
Placer County Water Agency	306	292	203	261
Rio Linda/Elverta Community Water District	226	*204*	127	*181*
City of Roseville	309	278	165	247
City of Sacramento	282	253	158	225
Sacramento County Water Agency	295	265	153	236
San Juan Water District	516	464	293	413
Sacramento Suburban Water District	257	231	142	206

Notes:
[1]Only from the Cordova System (A. Talbot, personal communication, 2018).
[2] Actual data provided by personal communication with A. Talbot, 2018.

Long-term Water Use Efficiency Measures

After several years of historic drought, Governor Edmund G. Brown Jr. declared a drought state of emergency on January 17, 2014, and directed the State Water Board to adopt emergency regulations. These regulations included mandates to urban water suppliers to implement drought response plans and limit outdoor irrigation and other water practices. Starting on April 1, 2015, Governor Brown took a series of actions to continue to address the state's severe drought conditions, including Executive Order B-29-15 which mandated a 25 percent statewide reduction in potable urban water use. Urban water suppliers were

assigned a conservation standard from 4 to 36 percent reduction in water use, based on their residential gallons per capita per day for the months of July to September 2014. Urban water suppliers in the Region rose to the challenge. Sacramento-area residents and businesses contributed to 12 percent of the state's total savings from June 2014-December 2016. In 2016, Sacramento-area urban water supplier and residents reduced water use by 25 percent, compared to 2013. Although the state of drought emergency was lifted in April 2017, water conservation remains a central focus in California and the Region.

Executive Order B-37-16, signed in May 2016, sought to establish long-term conservation measures in California. The Order focused on one of the ten principles originally outlined in the California Water Action Plan: "Make Conservation a California Way of Life." Assembly Bill (AB) 1668 and SB 606, signed in May 2018, were developed based on the California Water Action Plan's long-term framework for water conservation and drought planning. AB 1668 and SB 606 require DWR and the State Water Board to develop standards for water loss, indoor and outdoor residential use, and commercial, industrial, and institutional water use. Beginning November 1, 2023, urban retail water suppliers will be required to calculate their urban water use objective and actual water use on an annual basis. Guidelines and methodologies to calculate urban water use objectives have not yet been developed. As described in this section, the Region has a history of successfully meeting water use targets and reducing demands, and will continue to implement measures to achieve long-term water use efficiency.

Urban Water Demand Management Practices and Measures

Conservation and demand management have been and will continue to be actively employed throughout the Region. Potential conservation BMPs were studied initially in this region in the City of Sacramento's Water Conservation Study/Urban Management Plan prepared in September 1991. Subsequently, the Water Forum recommended an expanded list of conservation measures, including residential water metering. Through discussions with various stakeholders and water agency representatives, the Water Forum developed a list of conservation measures, or BMPs, for adoption and implementation. The Water Forum anticipates full implementation of these BMPs by the year 2030.

The BMPs adopted by the Water Forum are a subset of those developed by the California Urban Water Conservation Council (CUWCC)[9] and DWR. CWC Section 10631 also stipulates that Demand Management Measures (DMM) required in UWMPs are synonymous with CUWCC's BMPs. Nineteen of the 26 water agencies in the Region develop UWMPs, and these agencies are required to implement and track progress on the BMPs or DMMs. Explanations of DMMs are available in DWR's *2015 Urban Water Management Plans Guidebook for Urban Water Suppliers* (DWR 2016b). One of the BMPs/DMMs that

[9] The California Urban Water Conservation Council has transitioned to the California Water Efficiency Partnership.

discusses wholesale agency assistance programs is only applicable to a handful of agencies in the Region.

Regional Water Use Efficiency Program

The RWA operates an award-winning Water Use Efficiency Program (WEP), a program designed to help its participants implement their BMPs by pooling resources. All members of the RWA, except the City of Yuba City, have participated in this program since its creation in 2001 or since they joined the RWA. WEP's advisory committee continues to meet every other month. WEP has a user-friendly Web site titled "Be Water Smart," which can be accessed at http://www.bewatersmart.info/. WEP program activities include:

- Toilet, clothes washer, turf removal, and irrigation efficiency rebate programs.
- Residential customer workshops on how to conserve water indoors and outdoors.
- Annual trainings for landscape professionals on river friendly landscape principles and practices.
- Water education programs including a public services announcement video contest geared towards high school and middle school students.
- Annual public outreach campaigns that include radio, television, online, and social media advertising. Campaign themes have included Rethink Your Yard and Check Your Soil and Save. RWA coordinates events and messaging with local water agencies.
- Partnering with state and local entities like Save Our Water and the Sacramento Tree Foundation on public outreach efforts
- Indoor fixture direct installations for low income households and commercial, industrial, and institutional facilities located in low income neighborhoods or that service low income households.

2.9.1.4. Metering Policies

Water metering was a contentious issue historically in the Region for a variety of social, physical, and financial reasons. Notwithstanding regional sentiment, a variety of laws and policies have been enacted to addressing water metering:

- Since 1992, CWC Section 525-529.7 requires all new construction statewide to have water meters installed during construction.

- Agencies using CVP water, including water supplied under Public Law 101-514 (Fazio Water) (e.g., SJWD) have been required to meter all connections since the Central Valley Project Improvement Act was passed in 1992.

- Signatories to the WFA (2000) agreed to phased implementation of water meters over a period of years.

- AB 2572, passed in 2004 requiring water meters on all residences by 2025 for urban water suppliers, which primarily addressed agencies with water metering prohibitions in their charters. An urban water supplier is defined in CWC Section 10617 as having either 3,000 connections or supplying more than 3,000 acre-feet of water per year.

Almost all water agencies in the Region are now fully metered or have plans for full meter implementation with metered rates by 2025. In the Sacramento Region, 91 percent of the water accounts are metered. Most Sacramento-area water providers are 100 percent metered and have been for years. Others are continuing to upgrade their systems, including installing state-of-the art wireless water meter reading systems at homes and businesses.

2.9.2. Water Supplies

Meeting water demands with adequate and reliable water supplies is an essential goal of water agencies. Potential sources of water supply include surface water, groundwater, and recycled water. In the Region, most water demands are met by surface water supplies, with groundwater meeting most of the remaining demand. A small, but growing percentage of supplies are provided by recycled water. Total regional demands met by surface water, groundwater, and recycled water supplies are currently being calculated as part of the RWRP. Recycled water is a hydrology-independent source of supply. However, recycled water is used only in certain portions of the Region, and a larger scale integration of recycled water into the regional water portfolio remains a continuing goal and a challenge. After a discussion of each of these water sources, this subsection concludes with a characterization of the current water supply portfolios and projected water supplies for each water agency, portraying some of the future challenges in the Region.

2.9.2.1. Surface Water Supplies

The Region has three sources of surface water: American, Sacramento, and Cosumnes rivers. Availability of surface water is dependent on water rights and contract agreements, which legally define who can use water where, when, and how. Surface water availability is also constrained by hydrology and related diversion limitation agreements or legal restrictions as well as infrastructure capacity to pump, treat, store,

and deliver water at the time, quantity, and quality that it is needed. Discussion of surface water constraints is presented in **Section 2.9.2.1** and includes the WFA, Hodge Flows, and Reclamation's CVP restrictions.

Water Rights and Contracts

This subsection provides a regional overview of available surface water from the Sacramento, American, and Cosumnes rivers pursuant to water rights, contracts, and other agreements. This information is presented by agency in **Table 2-23**. This discussion on water rights and contracts is intended to provide a general overview of water availability from a high-level discussion perspective, and is not an exacting legal description. Listed water rights and contracts include known conditions or restrictions, such as POU, diversion rate limitations, and seasonal or hydrologic restrictions. The data displayed in **Table 2-23** show the potential maximum amount of water an agency may access, including supplies possibly available during surplus conditions, if the agencies have the infrastructure capacity and water demands to accommodate the diversion. Information listed in the table was gathered through regional and local water plans and other documents, as well as interviews conducted with regional water purveyors as part of the NAB RDCP and RWRP.

The discussion of water supply availability by agency and the interplay of constraints, such as hydrology, infrastructure capacity, and availability of supplemental supplies is found in **Section 2.9.2.5**. Thus, data presented in **Table 2-23** does not necessarily correlate with current actual or future agency water demand data.

Water is commonly "wheeled" in the Region from wholesaler to retailers through subcontracts, assignments, and agreements. For example, Roseville has an agreement with SJWD to receive 4,000 AFY from SJWD's up to 25,000 AFY contract with PCWA for Middle Fork Project water. Due to these subcontracts, assignments, and agreements, the water rights and contracts data are not directly totaled to provide an overall regional number. As shown in **Table 2-23**, agencies that provide water to other retailers throughout the Region include PCWA (from its Middle Fork Project water rights), City of Sacramento, SCWA and SJWD (from the American River), and SSWD. A brief narrative follows **Table 2-23** to describe water rights and contracts in the Region.

This subsection focuses on water rights and contracts held by municipal water agencies. Accordingly, there may be other, independent agricultural water rights holders from the American, Sacramento, and Cosumnes rivers that are not listed. Further, an agency's water rights or contracts outside the Region, if distinguishable, are not included for overall clarity. This is especially relevant to PCWA and EID, that have jurisdiction and active service areas across Placer and El Dorado counties, respectively, but those areas are beyond the formal Region.

Table 2-23. Surface Water Rights and Contracts

Water Agency	American River		Sacramento/Cosumnes Rivers	
	Description of Right or Entitlement	Maximum Use (AFY)	Description of Right or Entitlement	Maximum Use (AFY)
California American Water	Purchase from Sacramento	4,831	N/A	N/A
	Purchase from SSWD as part of SSWD agreement with PCWA	2,000		
	Purchase from SCWA	5,000		
	Total	11,831		
Carmichael Water District	Appropriative	10,859	N/A	N/A
	Appropriative	3,669		
	Appropriative	18,099		
	Aerojet Contract	2,200		
	Total	34,827		
Citrus Heights Water District	Wholesale contract with SJWD	Unspecified quantity [1]	N/A	N/A
	Total	Unspecified quantity [1]		
Del Paso Manor Water District	Contract with Sacramento via SSWD	2,460	N/A	N/A
	Total	2,460		
Fruitridge Vista Water Company	Contract with Sacramento	3,629	N/A	N/A
	Total	3,629		
El Dorado Irrigation District [2]	Reclamation-Folsom Reservoir	7,550	N/A	N/A
	From EDCWA, Public Law101-514 Fazio [3]	7,500		
	FERC Project 184 (Appropriative) License 2184 and Pre-1914 Water Rights	15,080		
	Licenses 11835 and 11836 Permit 21112	4,560		
	Applications 5645X12, 5644X02 and partial assignment of Applications 5645, 5644 with El Dorado-SMUD Cooperation Agreement[14]	23,000		
		17,000		
		30,000		
	Total	104,690		
Elk Grove Water District			Purchase from SCWA [4]	2,935
			Total	2,935

Table 2-23. Surface Water Rights and Contracts (contd.)

Water Agency	American River		Sacramento/Cosumnes Rivers	
	Description of Right or Entitlement	Maximum Use (AFY)	Description of Right or Entitlement	Maximum Use (AFY)
Fair Oaks Water District	Wholesale contract with SJWD	Unspecified quantity [1]	N/A	N/A
	Total	Unspecified quantity [1]		
Folsom, City of	Pre-1914	22,000	N/A	N/A
	Pre-1914 Co-tenancy with GSWC (assigned in perpetuity)	5,000		
	Agreement with SCWA for Public Law 101-514 "Fazio Water"	7,000		
	Pre-1914 and CVP Supply through wholesale contract with SJWD	Unspecified quantity [1]		
	GET A and GET B Supply	3,250		
	Total	37,250		
Golden State Water Company	Pre-1914 [5]	5,000	N/A	N/A
	Total	5,000		
Lincoln, City of	Contract with PCWA	20,724	N/A	N/A
	Total	20,724		
Natomas Central Mutual Water Company [6]			Appropriative from Sacramento River (conditioned by Settlement Agreement with Reclamation)	120,200
			Total	120,200
Orange Vale Water Company	Wholesale contract with SJWD	Unspecified quantity [1]	N/A	N/A
	Total	Unspecified quantity [1]		
Placer County Water Agency	Middle Fork Project	120,000	N/A	N/A
	CVP Contract	35,000		
	Agreement with PG&E	100,400 [7]		
	PG&E (Zone 3) Purchase Agreement (1982)	25,000		
	South Sutter WD Contract	12,000		
	Pre-1914	3,400 [8]		
	Pre-1914 Appropriative Right (S000959)	Not stated		
	Pre-1914 Appropriative Right (S000967)	Not stated		
	Pre-1914 Appropriative Right (S010397)	Not Stated		
	Pre-1914 Appropriative Right (S010398)	Not Stated		
	Total	295,800		
	Subcontracted to Lincoln, Roseville, SJWD, and SSWD [9,] Cal-Am contract wheeled through Roseville	(110,988)		
Rancho Murieta Community Services District	N/A	N/A	Cosumnes River:	
			Permit 16762	6,368
			Total	6,368

Table 2-23. Surface Water Rights and Contracts (contd.)

Water Agency	American River		Sacramento/Cosumnes Rivers	
	Description of Right or Entitlement	Maximum Use (AFY)	Description of Right or Entitlement	Maximum Use (AFY)
Roseville, City of	CVP Contract	32,000	N/A	N/A
	Call on SJWD's PCWA entitlement water	4,000		
	Water Purchase Agreement with PCWA	30,000		
	Total	66,000		
Sacramento, City of	Appropriative (conditioned by Settlement Agreement with Reclamation) [10]	245,000	Sacramento River:	81,800
	Total	245,000	Pre-1914 and Appropriative (conditioned by Settlement Agreement with Reclamation)	
	Obligated sales to neighboring agencies	(30,017)	Total	81,800
SCWA	CVP Supply (SMUD 1, SMUD 2, and Fazio Water)	45,000	Sacramento River:	
	Wholesale Water Agreement(s) with Sacramento	9,300	Appropriative Water [11]	35,000
	Total	54,300		
	Subcontracted to EGWD [12]	(4,600)		
San Juan Water District	Pre-1914	33,000	N/A	N/A
	CVP Contract (EID, Folsom, SCWA) includes "Fazio" Water (Public Law 101-514)	24,200		
	Water Purchase Agreement with PCWA	25,000[15]		
	Total	82,200		
	CHWD, FOWD, Folsom, and OVWC [13]	Unspecified quantity		
Sacramento Suburban Water District	Agreement with City of Sacramento	9,300	N/A	N/A
	Agreement with PCWA[16]	29,000		
	Purchased Water from USBR (Section 215)[17]	200		
	Total	38,500		

Data Source: RWRP (RWA 2018), 2015 UWMPs, Rancho Murieta 2010 Integrated Water Master Plan Update, RLECWD 2015 UWMP.

Notes: [1] CHWD, FOWD, OVWC, City of Folsom north of the American River (Ashland area), and the San Juan Water District Retail service area have an unspecified quantity contract with SJWD that states that SJWD will deliver water according to each of their demands.

[2] EID also has water rights from the El Dorado Forebay and Jenkinson Lake, which are not part of the Region.

[3] Projected to be available by 2020.

[4] EGWD does not have any entitlements to surface water; however, EGWD does purchase wholesale water from SCWA who does have surface water rights to Sacramento River water. This volume of water was the highest amount of water EGWD purchased from SCWA since 2010, as reported in EGWD's 2015 UWMP. The water was most likely primarily groundwater delivered by SCWA to EGWD. However, depending on SCWA's infrastructure, there is the potential that SCWA could deliver the water as 100% surface water.

[5] GSWC has access to Pre-1914 water through the Natoma Ditch Company and associated POU. A portion of this water (5,000 AF/year) is contracted to Folsom.

[6] For use in both Sacramento and Sutter counties. Includes base supply of up to 98,200 AF and CVP supply of up to 22,000 AF.

[7] Water sources are Yuba and Bear rivers, outside the Region.

[8] Water sources are tributaries to Auburn Ravine and Coon Creek, outside the Region.

[9] PCWA supplies Lincoln from a mix of all its water sources, including but not exclusively of Middle Fork Project Water.

[10] Settlement agreement with Reclamation limits Sacramento's total diversion from the Sacramento and American rivers. This total was 227,500 AFY in 2010 and is to gradually increase to 326,800 by 2030.

Notes (contd.):
[11] SCWA's appropriative water rights to divert water from the American and Sacramento Rivers (Permit 21209) provide intermittent water that typically would be available during the winter months of normal or wet years. The number shown is the expected long-term average use of the water and not the water right amount, which can range up to 71,000 AFY.
[12] SCWA water sold to EGWD is a mix of surface and groundwater.
[13] Amount wholesaled from SJWD includes contracts with CHWD, FOWD, OVWC, and Folsom (Ashland area), with unspecified quantities.
[14] Section 5.1.1 of the El-Dorado SMUD Cooperation Agreement indicates that 40,000 acre-feet of SMUD water will be available after 2025. For conservative Normal Year planning purposes, El Dorado Irrigation District uses 30,000 acre-feet of available supply.
[15]Revised in 2017, 12,500 AFY take-or-pay and with ability to call for up to 25,000 AFY.
[16]PCWA is 12,000 AFY take-or-pay but they can call for up to 29,000 AFY. This water is only available to SSWD when the inflow to Folsom is above 1.6 MAF.
[17] 215 water is not a regular water supply and others have access to it when it is available.

Key:
AFY = acre-feet per year
Cal-Am = California American Water
CHWD = Citrus Heights Water District
CVP = Central Valley Project
EDCWA = El Dorado County Water Agency
EGWD = Elk Grove Water District
EID = El Dorado Irrigation District
FERC = Federal Energy Regulatory Commission
FOWD = Fair Oaks Water District
GET = Groundwater Extraction and Treatment
GSWC = Golden State Water Company
N/A = not applicable
NID = Nevada Irrigation District
OVWC = Orange Vale Water Company
PCWA = Placer County Water Agency
POU = Place of Use
RLECWD = Rio Linda/Elverta Community Water District
SCWA = Sacramento County Water Agency
SJWD = San Juan Water District
SMUD = Sacramento Municipal Utility District
South Sutter WD = South Sutter Water District
SSWD = Sacramento Suburban Water District
UWMP = Urban Water Management Plan

American River Water Rights

Water agencies in the Region hold just over 500,000 acre-feet of American River water rights for consumptive use purposes (Reclamation 2017). Eight agencies participating in the ARB IRWMP have water rights on the American River: CWD, EID, Folsom, GSWC, PCWA, City of Sacramento, SCWA, and SJWD. Details of these water rights are summarized in **Table 2-23**. The POU of this water is usually coincident with the jurisdictional boundaries of the respective agencies. Exceptions include the City of Sacramento that has an authorized POU for American River water outside the current city limits, generally including: (1) portions of SSWD, (2) Del Paso Manor, (3) SCWA Arden Park Vista Service Area, and (4) CWD. The POU for SJWD's water rights is its wholesale service area. The POU for PCWA prioritizes use in Placer County before use in Sacramento County. Portions of the Region are supplied by water sources that lie outside of Region boundaries, including the upper American, Bear, and Yuba rivers. Aside from local water agencies, Reclamation has diversion rights to much of the American and Sacramento River flows for use by the CVP.

American River Contracts

Four agencies have existing water supply contracts with Reclamation for CVP supplies: EID, PCWA, Roseville, and SJWD. SJWD can provide CVP water to agencies in its wholesale service area, including CHWD, FOWD, Folsom-Ashland, and OVWC. Details of these contract entitlements are summarized in **Table 2-23**.

In addition, SJWD and SCWA have other CVP water supply entitlements with Reclamation from Public Law 101-514 (commonly referred to as "Fazio Water"). SJWD's supply may be used in SJWD's Sacramento County wholesale area. Folsom has a subcontract with SCWA for 7,000 AFY. EID also receives Fazio Water from El Dorado County Water Agency. SCWA's "SMUD Assignment" water is another water supply contract with Reclamation.

Four agencies with American River water rights contract their water to other local water agencies: PCWA, Sacramento, SCWA, and SJWD. PCWA has water contracts with Reclamation and Pacific Gas and Electric (PG&E) and provides water to Cal-Am, Lincoln, Roseville, SJWD, and SSWD. The City of Sacramento provides (or can provide) American River water to Del Paso Manor, FVWC, SCWA, and SSWD in its American River POU. SSWD further subcontracts some of this water to Cal-Am, potentially Del Paso Manor, GSWC, and portions of SCWA. SCWA has appropriative water rights to divert water from the American River (via the Sacramento River) and subcontracts some of that water to Cal-Am and Elk Grove. SJWD is a wholesaler to its retail customers CHWD, FOWD, OVWC, Folsom (Ashland), and also contracts with SSWD to treat SSWD's PCWA contract water when SSWD calls on it, and Roseville may call on up to 4,000 AFY of SJWD's PCWA contract water (SJWD 2015).

Sacramento River Water Rights

NCMWC, City of Sacramento, and SCWA have water rights on the Sacramento River. Total rights held by NCMWC in both Sacramento and Sutter counties are for up to 120,200 AFY per the Settlement Agreement between NCMWC and Reclamation. The City of Sacramento holds a combination of pre-1914 and appropriative water rights on the Sacramento River for diversion of up to 225 cfs, up to 81,800 AFY, for service in the city limits. SCWA also has an appropriative water right to divert water from the Sacramento River to provide intermittent water that typically would be available during the winter months of normal or wet years.

Cosumnes River Water Rights

Rancho Murieta obtains all its water supplies from the Cosumnes River through Permit 16762 issued in 1969 and renewed for 2001 to 2020.

Aerojet Replacement Water Supply

Aerojet has legal responsibility for groundwater contamination attributable to its activities in portions of Sacramento County. This contamination has affected some water agencies' groundwater supplies, including GSWC and Cal-Am. Aerojet provides replacement water from its extraction and treatment of contaminated groundwater at several groundwater extraction and treatment (GET) facilities. Treated water is obtained

from the northern portion of the South American Subbasin and is discharged in the American River and its tributaries (SCWA 2016a). Legal agreements include contracts to use this remediated Aerojet water.

Aerojet has guaranteed that replacement water supplies will be made available to offset lost groundwater production in the GSWC's Cordova System GSWC, up to a maximum 15,200 AFY. GSWC can divert up to 5,000 AFY of GET water via the Folsom South Canal.

In 2010, SCWA entered into an agreement with Aerojet to transfer ownership of 8,900 AFY of remediated groundwater (SCWA 2011). CWD also obtains reclaimed water from Aerojet facilities.

The 2007 Aerojet Agreement between Folsom and Aerojet stipulates that Folsom has access to GET water from GET Facilities A and B. Both facilities underwent modifications, pursuant to a partial consent decree with the EPA. In recent years, Folsom has relied on Aerojet to pump and treat groundwater for its service area. Per the 2007 agreement, Folsom may treat 3,250 AFY of groundwater produced by GET Facilities A and B to serve industrial demands (Folsom 2016).

Other Agreements

Folsom, SSWD, Roseville, and SJWD have temporary contracts with Reclamation for surplus water (often referred to as Section 215 water). Section 215 water is available on an intermittent basis subject to hydrologic conditions.

Surface Water Use Constraints

The beginning of **Section 2.9.2.1** discussed the legal background and setting of water availability in the Region. The maximum water rights and contract amounts, however, are rarely used. Some of the limiting factors are the WFA, Hodge Flows (a legal decision), Reclamation's CVP restrictions, and infrastructure limitations of the water delivery systems. Annual hydrology and inflow to Folsom Reservoir triggers the WFA and Hodge Flows, as both seek to maintain environmental flows in the lower American River during dry and critically dry periods. CVP allocations are similarly hydrology dependent. Infrastructure limitations result from water demand growth apart from existing infrastructure or sources of supply, lack of funds to maintain older systems and construct new facilities, and differing system designs among individual water agencies.

The recent drought showed regional vulnerabilities to climate change were not limited to water supply infrastructure, but also water rights. Water rights on the American River were historically viewed as 100 percent reliable. However, in response to the drought, the State Water Board issued curtailments on water right diversions throughout the state, including against senior rights holders on the American River

(Reclamation 2017). In 2014 and 2015, water rights in the Region became subject to curtailment notices. Further, access to CVP supplies was limited by historically low storage in Folsom Reservoir. Water agencies were close to losing their intake's physical ability to access water in Folsom Reservoir in 2015, even though they still had the legal right to divert water (Reclamation 2017). These regulatory and physical infrastructure constraints have redefined the water supply reliability vulnerabilities of many water users. These constraints will likely increase with climate change. The demand and supply portfolios developed for the NAB RDCP and RWRP assessed the priority and POU restrictions for surface water rights and reliability of contract entitlements for each agency. Mitigation strategies to address vulnerabilities to water rights curtailments are described in **Section 2.10.2**.

Water Forum Agreement

The WFA, a voluntary MOU among signatories, includes water diversion restrictions according to the American River hydrologic year types, restricting overall water diversions (AFY) for each signatory agency. These restrictions are intended to maintain flows in the lower American River in times of shortage. As shown in **Table 2-11**, water year types for the American River are determined by the amount of unimpaired inflow into Folsom Reservoir from March to November. Each signatory faces restrictions during drier or dry years, and some agencies, such as Roseville, have agreed to leave water in the American River during certain years of shortage. Other water agencies with limited groundwater availability have signed agreements with neighboring agencies willing to use more groundwater supplies in dry years and forgo surface water use.

Hodge Flows

Hodge flows refer to Judge Richard Hodge's ruling in *Environmental Defense Fund v. East Bay Municipal Utility District*. Sacramento's American River water diversion rates are restricted if river flows that reach the Fairbairn WTP are below 2,000 cfs from October 15 through February 28, 3,000 cfs during March through June, and 1,750 cfs during July through October 14.

Reclamation's CVP Water Use Conditions

Reclamation imposes a shortage policy for CVP water in times of drought, unavoidable interruptions, and other operational restrictions from legal obligations. This shortage policy applies to CVP water from both American and Sacramento rivers. Reclamation's shortage policy, generally, is as follows: M&I contractors receive 100 percent of contract amounts until agricultural service contractors are reduced by 75 percent of their contracts. Once that point is reached, agricultural service contractors' reductions are still applied against contract amounts, but M&I contractor deliveries are determined based off a percent of historical use determined by taking the average of what was received in the 3 most recent years of unconstrained

deliveries. This may translate to agricultural service contractors receiving 70 percent of contract and M&I getting 95 percent of historic use. Additionally, M&I contractors will not receive 70 percent of historic use until agricultural service contractors drop to 20 percent of contract.

2.9.2.2. Groundwater Supplies

As discussed in **Section 2.6.3**, the Region overlies productive and generally high-quality groundwater subbasins. Groundwater is both a primary supply for some agencies and a supply that augments surface water use for some agencies, especially during shortage periods. The WFA established sustainable yields for each of the three groundwater subbasins underlying Sacramento County in the Region, and prescribed a regional conjunctive use program to optimize regional water supplies. The GSAs in the Region and IRWM Coordination Zone will further refine the sustainable yields and water budgets for these subbasins as part of GSP development. While groundwater is a regionally significant source of supply, some agencies, particularly those along the eastern edge of the Region, do not have access to groundwater due to underlying geologic conditions.

Table 2-24 shows historical groundwater pumping by public water suppliers in the Region from 2006 – 2015, as reported in the 2015 UWMPs. Similar to regional water demands, these data show a 24 percent decrease in groundwater use over the past 9 years, which in part, can be attributed to an increase in conjunctive use practices. The Sacramento region has been moving toward more conjunctive use of surface water and groundwater depending on hydrologic conditions. Conjunctive use is the coordinated use of surface water during wet years and groundwater during dry years. This trend is not as evident between 2000 and 2010 when, for example, significantly more surface water was used in 2008 even though it was classified as a drier year (SGA 2018). In 2010, however, additional Water Forum requirements related to surface water use came into effect. Since that time, conjunctive use has increased. For example, in 2010, 2011, and 2012, all wet or average years more surface water was used than groundwater.

2013, 2014, and 2015 (all dry years) saw more groundwater used than surface water. As shown in **Table 2-24**, some agencies increased groundwater extraction in 2013 and 2014. This can be attributed to water rights curtailments in 2013 and 2014 and a reduction in surface water resources caused by the drought. For example, groundwater production in the North American Basin increased during 2013 and then decreased thereafter to a volume nearly equal to 2011 (SGA 2018). This reduction was in large part due to conservation efforts during drought conditions. The Region reduced total water demand (groundwater and surface water) by 20 percent in 2014 and 30 percent in 2015 compared to 2013.

The reported reduction in groundwater extraction over the past nine years supports observed recovering groundwater levels in SGA and SCGA Basin Management Reports. Independent groundwater pumpers and

small water suppliers are not required to report extractions in California, so those data are not available for this report.

Table 2-24. Groundwater Extraction (AFY)

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
California-American Water	40,748	41,320	44,012	42,907	34,849	29,811	32,893	38,136	33,951	27,966
Carmichael Water District	3,519	2,868	1,581	1,609	1,518	1,469	1,579	2,030	3,417	2,543
Citrus Heights Water District	100	98	352	2,120	1,560	962	587	465	1,930	841
Del Paso Manor Water District	1,673	1,737	1,650	1,489	1441	1,398	1,533	1,549	1,432	1,052
El Dorado Irrigation District	0	0	0	0	0	0	0	0	0	0
Elk Grove Water District	6,365	6,963	6,460	5,407	3804	4615	5582	5194	4117	3398
Fair Oaks Water District	845	899	2,225	1,109	1,194	1,516	1,562	1,319	2,329	872
City of Folsom	0	0	0	0	0	0	0	0	0	0
Fruitridge Vista Water Company [2]	3,717	n/a	n/a	n/a	7,659	n/a	n/a	n/a	n/a	11,273
City of Galt	5,668	6,203	5,953	5,741	5,174	5,120	5,699	6,132	5,382	4,163
Golden State Water Company	14,425	11,006	10,438	9,324	7,679	5,731	6,685	7,273	5,111	4,397
City of Lincoln	623	924	1,085	836	962	0	0	0	0	0
Orange Vale Water Company	0	0	0	0	0	0	0	0	0	0
Placer County Water Agency [3]	0	0	0	0	0	0	0	0	0	0
Rio Linda/Elverta Community Water District	3,378	3,305	3,340	2,914	2,719	2,542	2,857	3,051	2,449	2,109
City of Roseville [4]	0	1,468	392	0	0	0	0	0	296	6
City of Sacramento	20,917	18,618	18,414	18,867	17,768	17,811	14,363	12,568	14,393	13,479
Sacramento County Water Agency	34,152	35,803	39,248	39,450	37,121	34,626	30,629	28,828	27,781	24,652
Sacramento Suburban Water District	26,559	37,084	23,516	23,021	20,178	19,119	27,530	38,145	32,561	27,422
San Juan Water District	0	0	0	0	0	0	0	0	0	0
Total	**162,689**	**168,296**	**158,666**	**154,794**	**143,626**	**124,720**	**131,499**	**144,690**	**135,149**	**124,173**

Notes:
[1] Del Paso Manor Water District is not required to submit UWMPs but reports data to Sacramento Groundwater Authority. Del Paso Manor Water District data were provided by personal communication with D. Sedwick, 2018
[2] Fruitridge Vista Water Company did not report data for all noted years in its 2010 and 2015 UWMP.
[3] Placer County Water Agency does use groundwater supplies in Zone 40 near Truckee, but not in western Placer County
[4] Groundwater use in 2007 and 2008 was driven by the Aquifer Storage and Recovery demonstration project as opposed to water supply, Source: 2010 UWMP
[5] 2011-2015 groundwater extractions were provided from the 2015 UWMPs.
Key:
AFY = acre-feet per year
UWMP = Urban Water Management Plan

2.9.2.3. Recycled Water

Seven agencies in the Region (SRCSD, SCWA, EID, Lincoln, Rancho Murieta, Roseville, and Galt) use recycled water as part of their water supply portfolios. Recycled water is a hydrology-independent supply,

making it a very reliable source of water. Availability and production of recycled water is directly dependent on the availability of treatment and distribution infrastructure with a complementary customer demand for recycled water supply. Recycled water is expected to become an increasingly valuable regional water supply resource as local, regional, and statewide water demands continue to grow and other supplies become less reliable.

Table 2-25 summarizes the current use of recycled water in the Region. SRCSD, primarily a wastewater treatment provider, uses recycled water produced at its WRF to irrigate parks and school fields in addition to wholesaling recycled water to SCWA as part of the SRCSD/SCWA Demonstration Project. Galt also has capacity to produce recycled water, but currently uses it only at onsite agricultural fields. EID, Lincoln, Rancho Murieta, Roseville, and Galt currently operate recycled water programs to meet nonpotable water demands in their respective service areas and offset demands for potable water supplies.

Table 2-25. Recycled Water Use Summary–2015

Agency	Recycled Water Treatment Facility	Recycled Water Use (AFY)	Approx. Percent of Total Water Supply (%)
EID	El Dorado Hills WWTP Deer Creek WWTP [1]	2,400	3
Galt	Wastewater Treatment Plant	603	14
Lincoln	City of Lincoln WRTF	270	4
Rancho Murieta CSD	Rancho Murieta Wastewater Reclamation Plant	550	9
Roseville	Dry Creek WWTP Pleasant Grove WWTP	4,060	10
SCWA	SRCSD WRF	575	2
SRCSD	SRCSD WRF	500	N/A

Notes:
Recycled water use in 2015, per each agency's 2015 Urban Water Management Plan (UWMP), except for Rancho Murieta which is from 2010 Integrated Water Master Plan Update.
[1] Deer Creek WWTP is not located in the Region, but its system is interconnected with the El Dorado Hills system.

Key:
AFY = acre-feet per year
CSD = Community Services District
EID = El Dorado Irrigation District
SCWA =Sacramento County Water Agency
SRCSD = Sacramento Regional County Sanitation District
WRF = Water Recycling Facility
WRTF = Water Recycling Treatment Facility
WWTP = wastewater treatment plant

2.9.2.4. Desalinated and Imported Water

Currently, there is no known use of desalinated or imported water in the Region, and use of these supplies is not anticipated in the future.

2.9.2.5. Agency Water Supply Portfolios

Agency water supply portfolios describe the relative percentage of various water supply sources used by individual water agencies. An agency's portfolio can be affected by physical, legal, and hydrologic considerations associated with its respective supplies as explained in **Section 2.9.2.1**. Most water agencies in the Region are required to submit an UWMP, which includes information on an agency's water supply portfolio in normal and dry years. Water agency supply portfolios were updated as part of the NAB RDCP and RWRP. Water supply information for participating agencies was gathered from regional and local water planning documents, including 2015 UWMPs and Master Plans. Interviews were then conducted with each agency to validate the information in the draft portfolios and fill any data gaps. The reported data for current normal year reliability and data for current dry year reliability are presented in **Figure 2-33**. This figure shows which agencies have access to surface water, groundwater, and/or recycled water, and the relative proportions of those sources used by each water agency.

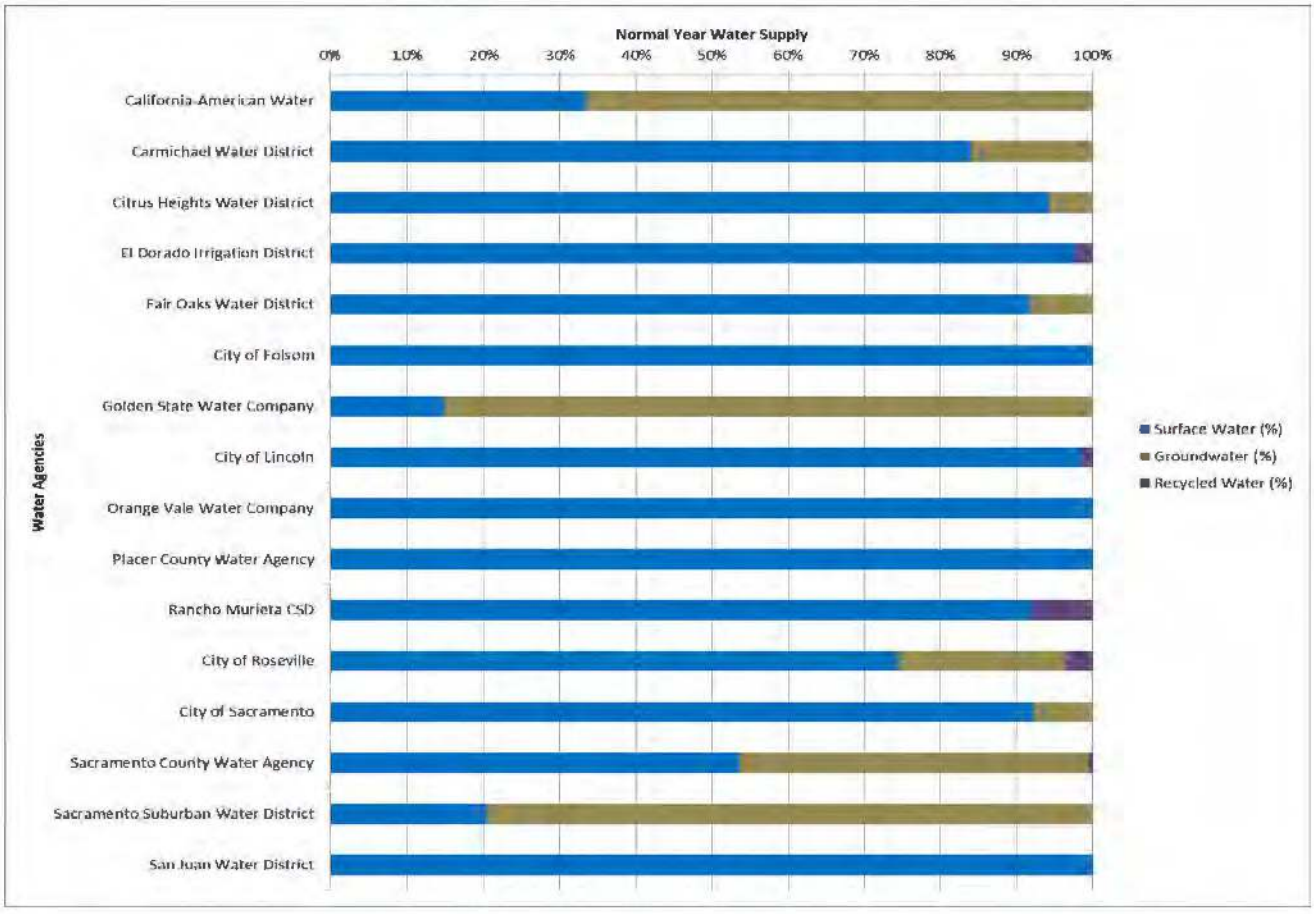
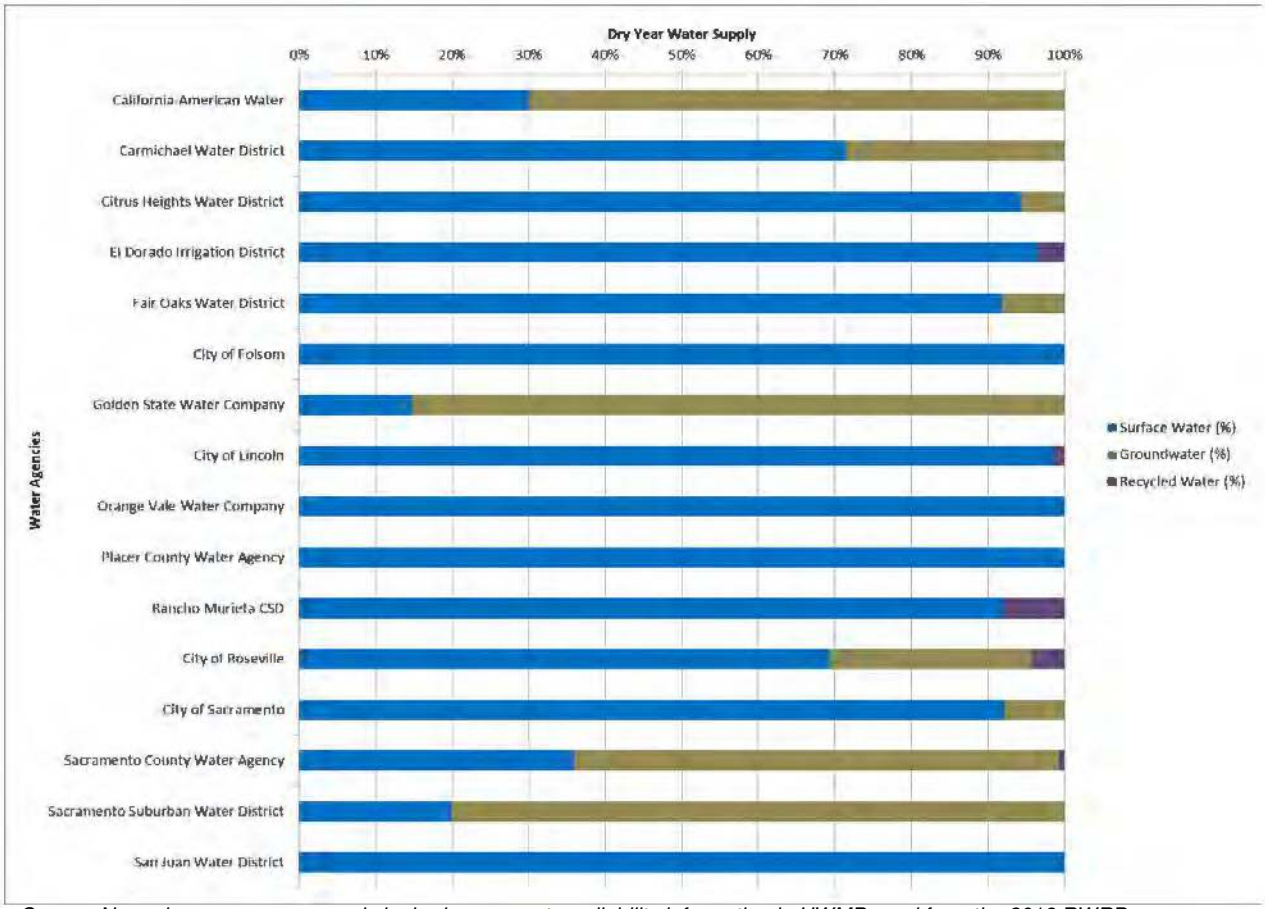


Figure 2-33a. Normal and Dry Year Water Supply Portfolios as Reported in 2015 UWMPs



Source: Normal or average year and single-dry year water reliability information in UWMPs and from the 2018 RWRP

Notes:
-Only those agencies that had complete normal and dry year water supply information were presented.
-The average and dry values were obtained from the water supply data presented in the 2018 RWRP.

Figure 2-33b. Normal and Dry Year Water Supply Portfolios as Reported in 2015 UWMPs

Figure 2-33 illustrates that groundwater continues to be a resource for some agencies and the Region as a whole in dry years to offset restrictions in surface water use. Thus, operational flexibility of water supply distribution becomes a regionally significant challenge, especially during dry years. If the Region were to leverage its surface water and groundwater assets through conjunctive use and banking activities, it could augment the limited storage in Folsom Reservoir and provide needed buffers to weather drought periods. The total estimated groundwater storage capacity north and south of the American River is more than double the capacity of Folsom Reservoir. Different from surface water storage, groundwater banking operations could extend over several years with both "puts" (recharge) and "takes" (recovery), giving additional flexibility to regional operations and potential participation in the statewide water market and other water transfer programs. However, the investment in infrastructure needed to fully realize a large-scale regional conjunctive use opportunity is significant. The Region has undertaken several planning efforts to establish a regional conjunctive use program, including the RWRP, NAB RDCP, American River Basin Study (ARBS), and American River Basin Water Marketing Strategy Project. The RWRP evaluates regional

opportunities for conjunctive use in the Region. This includes identifying the main inhibitors to a conjunctive use program, evaluating the storage potential of regional groundwater basins, assessing infrastructure constraints, and developing a conjunctive use operations simulation. This analysis indicates that using existing infrastructure, estimated region-wide recharge could be increased by up to 63 TAF per year in wet years by offsetting groundwater use with surface water, and region-wide recovery could be increased by nearly 58 TAF per year in dry years by offsetting surface water use with groundwater. The ARBS is an ongoing effort to further assess the water supplies and demands in the Region and address regional demand-supply imbalance and infrastructure deficiencies under existing and future climate change conditions. The ARB Water Marketing Strategy Project focuses on leveraging the potential for regional conjunctive use to further enhance existing regional market transfers through surface water reservoir reoperation and individual groundwater substitution practices. The project will evaluate the potential for water market asset development; determine the infrastructure investments needed to realize that market; and formulate an implementation plan that includes recommendations on governance, reporting, and monitoring procedures.

2.9.2.6. Projected Water Supplies

Projecting water supply availability and relating these projections to estimated future water demands are integral to planning over a 20-year horizon. **Table 2-26** summarizes water supply projections reported by each water agency in its respective 2015 UWMPs. These data include surface water, groundwater, and recycled water supplies. Projections for 2040 will be available for all water agencies in the 2020 UWMPs. According to the available data, water supplies in the Region are expected to fully meet projected demands through 2035.

Table 2-26. Projected Water Supplies

Water Purveyor	Projected Water Supplies (AFY)			
	2020	2025	2030	2035
California American Water	42,291	45,244	48,730	52,926
Carmichael Water District	41,473	41,473	41,473	41,473
Citrus Heights Water District	16,970	17,383	17,797	18,210
Del Paso Manor Water District	1,600	1,600	1,600	1,600
El Dorado Irrigation District	77,490	107,690	107,790	107,990
Elk Grove Water District	7,694	7,917	7,972	8,038
Fair Oaks Water District	23,338	23,338	23,338	23,338
Florin County Water District	2,668	2,668	2,668	2,668[2]
City of Folsom	38,790	38,790	38,790	38,790
Fruitridge Vista Water Company	14,532	14,532	14,532	14,532
City of Galt	5,858	6,405	7,008	7,675
Golden State Water Company	17,342	17,697	18,312	18,968
City of Lincoln	12,291	13,478	15,296	17,113
Natomas Central Mutual Water Company	29,000	23,000	23,000	23,000

Orangevale Water Company	4,568	4,686	4,860	4,981
Placer County – Ag/Ag-Res	71,850	70,634	69,422	68,209
Placer County Water Agency [1]	233,800	268,300	270,800	272,800
Rancho Murieta Community Services District	6,368	6,368	6,368	6,368
Rio Linda/Elverta Community Water District	4,846	5,681	6,650	7,462
City of Roseville	70,421	70,791	72,759	73,143
City of Sacramento	275,917	288,288	294,419	294,419
Sacramento County – Ag/Ag-Res	174,400	165,350	156,300	156,300[2]
Sacramento County Water Agency	82,900	82,900	87,900	97,900
Sacramento Suburban Water District	60,500	56,500	56,500	56,500
San Juan Water District[3,4]	82,200	82,200	82,200	82,200
Tokay Park Water District	142	142	142	142
Regional Total	**952,790**	**1,387,419**	**1,452,421**	**1,467,204**

Notes:
Rio Linda Elverta Community Water District data were provided in the 2015 UWMP. Rancho Murieta Community Services District data were provided in the 2016 Water Supply Assessment – Rancho Murieta North Project. Del Paso Manor Water District data were provided by personal communication with D. Sedwick, 2018. All other information was taken from the 2015 UWMP of each water purveyor. Sacramento and Placer County - Ag/Ag-Res is independent pumping, so it was assumed that future demand estimates would be fully met.

[1] Only Zones 1 and 5 in the Placer County Water Agency system are in the American River Basin Region

[2] Water supplies projected for the year 2035 was not available so 2030 projected water supply values were assumed.

[3] Except for CHWD and FOWD groundwater, CHWD and FOWD don't have water supplies as they receive wholesale deliveries from SJWD as demands require.

[4] 82,200 AFY reflect take-or-pay contract which as of 2018 is 12,500 AFY take-or-pay with the ability to call on up to 25,000 AFY.

Key:
AFY = Acre Feet per Year
CHWD = Citrus Heights Water District
FOWD = Fair Oaks Water District
SJWD = San Juan Water District
UWMP = Urban Water Management Plan

2.9.3. Future Outlook Considering Water Supplies and Demands

Comparing projected Region water demands (**Table 2-21**) and projected water supplies (**Table 2-26**), along with an understanding of Region water rights and contracts (**Table 2-23**) generally leads to the conclusion that overall, the Region has sufficient water to meet future needs—which is true in normal water years and especially true when comparing the Region to other IRWM regions statewide. However, future water shortages in single and multi-year scenarios continue to be of concern. For example, the State Water Board curtailed water rights in 2015, the first time since 1977 that senior water right holders had their water rights curtailed. Consequently, such curtailments have an impact on local water demands. RWA, its member agencies, and the Region expect to face future challenges and uncertainties and have created an ARB IRWMP Framework (**Section 5**) to effectively address those challenges at multiple levels of detail. The Region has a history of pro-actively planning for the future, and continues to benefit from decades of integrated planning efforts. Ongoing regional planning efforts include the RWRP, NAB RDCP, ARBS, and American River Basin Water Marketing Strategy Project. **Section 5** contains a more comprehensive discussion on water resources issues and challenges facing the Region, but at a high level, the following

issues potentially impact water demands, water rights, and water supplies, and are under active investigation:

- Climate change and associated hydrologic impacts
- Aging infrastructure and lack of funding to replace aging infrastructure
- Better integration of water infrastructure systems
- Groundwater contamination
- Urban conversion
- Protection of water rights
- Water quality and increasing regulations
- Watershed and ecosystem protection
- Integration with statewide water planning efforts

2.9.4. Conjunctive Use

As established in the WFA (completed in 2000), the Region has been actively and continually engaged in a regional conjunctive use program. Many agencies have the ability to use surface water in-lieu of groundwater in wet years and rely more on groundwater in dry years (e.g., SSWD, City of Sacramento, Roseville, SCWA, FOWD, and CHWD). However, California's historic drought and increasing hydrologic variability have revealed greater potential risk to agencies' surface water supplies in the Region than previously assumed. This is especially critical to agencies with limited in-district groundwater supplies. To address these vulnerabilities, the Region has undertaken several planning efforts to analyze the potential for an expanded regional conjunctive use program. These efforts include the NAB RDCP and RWRP, as well as the ongoing ARBS and ARB Water Marketing Strategy Project.

Analysis of conjunctive use potential in the North and South American subbasins was conducted as part of the NAB RDCP and RWRP. The analysis looked at the potential of the subbasins to store additional surface water supplies, a key factor in the success of a regional conjunctive use program. The analysis showed that the combined available storage capacity across both the North and South American subbasins is around 2 million acre-feet, based on spring 2017 groundwater conditions. This large, available capacity readily supports expansion of conjunctive use in the Region. The analysis also showed that existing infrastructure

in the North and South American subbasins (surface water treatment, groundwater extraction, interties, and conveyance) could support expansion of conjunctive use practices. In wet years, existing in-lieu and direct recharge across the Region may be increased by around 63 TAF per year. In dry years, extraction of groundwater may be increased by nearly 58 TAF per year to recover banked water supplies. Key barriers to realizing this conjunctive use potential are institutional factors, namely the cost difference in producing surface water and groundwater among agencies the Region. Establishing a regional groundwater bank could help alleviate some of these challenges.

The analysis also found that establishing a groundwater bank would provide many regional benefits, including improvements to regional water reliability. Groundwater banking would provide seasonal and annual flexibility by reducing reliance on surface water and maximizing the use of available water supplies. Groundwater conditions would improve by actively storing more water in the basins either through in lieu or direct methods.

The findings from this analysis will be further refined and expanded upon as part of the ARBS and ARB Water Marketing Strategy Project. The Region will continue to identify constraints and opportunities to establish a regional conjunctive use program.

2.10. Climate Change

Clear indications of a changing climate have been observed in California and the western United States over the last several decades. Statewide average temperatures have increased by about 1.7°F between the years 1895 and 2011, with even greater increases observed in the Sierra Nevada over that timeframe (CEC 2012). The effects of climate change on hydrology in California are already apparent, including changes to snowpack, river flows, storm intensity, temperature, winds, and sea levels. Planning for and adapting to the continuation of these trends, particularly their impacts on public safety, ecosystems, and long-term water supply reliability, will be among the most significant challenges facing water and flood managers this century (CNRA 2009, DWR 2013c).

State and local agencies are already engaged in a number of efforts designed to improve California's ability to adapt to a changing climate. IRWM planning efforts are collaborative and include many entities involved in water management. These aspects make IRWM an appropriate platform for addressing issues, such as climate change where multiple facets of water management are affected on a regional scale. To this end, climate change is one of 16 "standards" in the 2016 IRWM Guidelines, that IRWM plans must meet to receive planning and implementation grant funds through Proposition 1. To provide guidance for implementing this climate change standard and incorporating climate change analyses into the IRWM

planning process, DWR developed the Climate Change Handbook for Regional Water Planning (Handbook) (EPA/DWR 2011).

In accordance with the Handbook, this subsection describes the vulnerabilities due to climate change that stakeholders in the Region are likely to face in the future. Based on the severity of the vulnerability, each is given a ranking in relation to one another. This ranking process helps the Region determine where they are potentially vulnerable to climate change, and which considerations require the greatest attention. In addition, this subsection describes efforts that member agencies have taken to adapt to climate change and to reduce greenhouse gas (GHG) emissions in the Region.

The first vulnerability assessment for the Region was conducted as part of the 2013 ARB IRWMP Update. A revised vulnerability assessment was conducted for the Region following the historic California drought which began in 2012. The impacts of the drought were most evident in 2014 and 2015 after multiple dry years and record-low snowpack led to severe water rights curtailments and overdrafted groundwater basins in many parts of the state. The drought was followed by a series of storms in early 2017 that caused flooding. These extreme events revealed substantially greater risks to the public water supply system in the greater Sacramento region than previously anticipated. Hence, the revised vulnerability assessment was conducted as part of the NAB RDCP and RWRP. Regional climate change vulnerabilities and mitigation strategies first identified in 2013 have been updated with information from the NAB RDCP, RWRP, and other local and regional planning efforts. These include individual agency Water Shortage Contingency Plans, the Sacramento and San Joaquin Rivers Basin Study, and the American River Basin Plan of Study.

2.10.1. Regional Climate Change Effects and Vulnerabilities

This subsection describes the approach for assessing and prioritizing climate change vulnerabilities in the Region.

2.10.1.1. Approach

This approach for assessing climate change in the Region involved the following steps:

1. Characterizing the Region.
2. Reviewing regional climate change impacts.
3. Assessing and prioritizing climate change vulnerabilities using a checklist.
4. Conducting a quantitative vulnerability assessment.

5. Compiling ongoing efforts to address climate vulnerabilities.

This approach was developed consistent with the general approach outlined in the Handbook.

2.10.1.2. Characterize Region

To adequately analyze and address the potential impacts of climate change, a description of the existing resources in the Region that may be impacted was required. **Sections 2.1** through **2.9** characterize the water resources, environmental, and socioeconomic characteristics of the Region.

2.10.1.3. Review Regional Climate Change Impacts

Literature Review on Climate Change Impacts

There have been multiple studies of climate change impacts on water resources specific to the western United States and California. A literature review was conducted to survey existing information and determines the potential regional impacts of climate change. Reviewed documents included:

- Cal-Adapt (CEC 2011)
- Reports on the Third Assessment from the California Climate Change Center (CEC 2012)
- California Climate Adaptation Strategy (CNRA 2009)
- Central Valley Flood Protection Plan (DWR 2017b)
- Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future (NRC 2012)
- SECURE Water Act Section 9503(c) – Reclamation Climate Change and Water, Report to Congress (Reclamation 2016a)
- California's 2017 Climate Change Scoping Plan (CARB 2017)
- Sacramento County Climate Action Plan (Sacramento County 2011a)
- North American Basin Regional Drought Contingency Plan (PCWA et al. 2017)
- Regional Water Reliability Plan (RWA 2018)
- Sacramento and San Joaquin Rivers Basin Study (Reclamation 2016b)

- American River Basin Study Plan of Study (Reclamation 2017)

Climate change is projected to alter temperature patterns, globally and in California. Effects can include changes in average temperature, the timing of seasons, and the degree of cooling that occurs in the evening. In California, temperature increases are expected to be more pronounced in the summer and in inland areas (CNRA 2009). The degree of change experienced partially depends on global GHG emissions and atmospheric GHG concentrations. Temperatures are projected to increase steadily during this century, with generally greater changes occurring farther inland. In the Sacramento region, warming increases are estimated to be about 1 degree Celsius (°C) to 3°C (1.8°F to 5.4°F) at mid-21st century (2055) and about 2°C to 5°C (3.6°F to 9°F) at end-of-century (2084). The period since 1950 has been warmer across the U.S. Southwest (including California) than in any comparable period in the last 600 years (DWR and CNRA 2016). However, it is recognized that current regional climate projections contain substantial uncertainty. At the local level, specific changes to seasonal temperature profiles are more difficult to project precisely. Global climate models have coarse spatial and temporal scales that make projections for areas the size of the Region difficult. Regionally downscaled models are being developed that provide a higher level of resolution, but still include substantial uncertainty in their results (DWR 2017b).

Available climate projections suggest that over the next century, precipitation will likely progress from initially steady or slightly increasing, to slightly decreasing over the Sacramento River Basin (Reclamation 2016). Even without any change in the quantity of precipitation, a warmer climate is likely to lead to increased watershed evapotranspiration, an increase in the fraction of precipitation falling as rain instead of snow, and a decrease in spring snowpack and snowmelt (CEC 2012). Already, a greater proportion of annual runoff has been occurring earlier in the water year (Knowles et al. 2006). The combination of earlier snowmelt and shifts from snowfall to rainfall seem likely to increase flood peak flows and flood volumes, which is likely to affect associated flood risk (Miller et al. 2003, Fissekis 2008, Dettinger et al. 2009). Higher snow lines (elevations) could increase flood risk because more watershed area contributes to direct runoff (DWR 2017).

Mean sea level is expected to rise by approximately 4.8 to 23.9 inches by the year 2050 at the Golden Gate Bridge (NRC 2012). The lower Sacramento River in the southern portion of the Region is tidally influenced, and will be affected by rising sea levels. Despite predictions for somewhat less overall precipitation over the long term, the Region is also predicted to have more extreme storms (Sacramento County 2011a). The Sacramento region is also projected to have more frequent, longer, and more-extreme heat waves and longer periods of drought (Sacramento County 2011a).

Recent Climate Change Impacts

The extreme hydrologic conditions experienced in the Region and throughout California since 2012 have underscored the need for the Region to address regional vulnerabilities to climate change impacts. Recent drought, floods, and wildfires have shown that climatic change will continue to impact regional water supplies, water demands, water quality, ecosystems, and hydropower operations. The 2016 Sacramento and San Joaquin Rivers Basin Study identifies these projected impacts from future climate change conditions.

From 2012 to 2016, California experienced a prolonged drought with record-breaking low levels of precipitation, mountain snowpack, and snowmelt runoff. 2014 was the warmest recorded year in California history (USGS 2018). In 2015, the annual snowpack survey showed that mountain snowpack was five percent of historic average, the lowest level ever recorded (DWR and CNRA 2016).

Impacts of the drought were evident and wide-spread. Lack of surface water resources and issuance of water rights curtailments resulted in increased groundwater pumping and historic low groundwater levels in basins throughout the state. In addition to threats to water supply, low groundwater levels threatened water quality for many individual well owners and small, rural community water systems. Water right curtailments resulted in severely reduced contract allocations for some agencies and mandatory conservation measures. In addition, regulatory flow requirements were reduced, and riverine and Delta water quality requirements were adjusted.

In the Region, the dry lakebed of Folsom Reservoir became symbolic of the regional impacts of the drought. On December 4, 2015 storage in Folsom Reservoir stood at a record low level of 135,561 acre-feet. This surpassed the prior low of 140,600 acre-feet, which occurred during the 1977 drought. During this time, there was limited stored water to meet local water right diversions and CVP contract delivery demands, threatening the water supply to over one million people in the lower portion of the Region. Emergency actions were almost taken to ensure deliveries to SJWD, Roseville, and Folsom since the intake verged on inoperability.

The Region experienced a series of Atmospheric Rivers and storm systems in January 2017. Water from storm systems, king tides, release, and runoff into the watershed impacted several areas of the Region. Conditions caused by the extreme drought exacerbated the impacts of the storms. In January 2017, Governor Brown declared a state of emergency in counties across California, including El Dorado, Placer, and Sacramento. In Sacramento County, areas particularly affected included Rio Linda, Point Pleasant, Glanville tract, Wilton, and other southern portions of the County (Sacramento County 2018). Governor Brown declared an end to the drought in April 2017, and that was soon followed by a series of storms that caused flooding and sparked devastating wildfires.

2.10.1.4. Identify and Prioritize Key Regional Areas of Potential Vulnerability

During the 2013 ARB IRWMP Update, participating agencies identified and prioritized areas of potential vulnerability to climate change impacts. This was done with the intent of helping the Region better plan adaptation actions to target specific, high-priority climate vulnerabilities. Defined by the Intergovernmental Panel on Climate Change (IPCC), vulnerability is a function of the character, magnitude, and rate of climate variation (collectively, the climate hazard) to which a system is exposed, as well as to non-climatic characteristics of the system, including its sensitivity, and its coping and adaptive capacity (IPCC 2001).

The Handbook provided a useful checklist for qualitatively determining areas of potential vulnerability within the Region. Indicators of potential vulnerability include currently observable climate impacts, presence of climate sensitive features, and adaptive capacity of regional resources. At this point in the analytical process, the actual magnitude of impacts or consequences resulting from a potential vulnerability was not required. This information was used in the planning process to prioritize regional planning objectives, define performance metrics, and focus a more detailed, quantitative analysis.

During the 2013 ARB IRWMP Update, stakeholders in the Region met to discuss climate change mitigation and adaptation. Based on information provided by stakeholders in these meetings, the assessed likelihood of vulnerabilities, and regional values, prioritization was accomplished qualitatively, with issues assigned a low, medium, or high priority. The complete set of checklist responses and prioritizations can be found in **Appendix C**. The vulnerabilities of high priorities in the Region are described in the following subsection.

These vulnerabilities were refined as part of the NAB RDCP and RWRP using updated water supply and demand information. Following a review of regional characteristics and water agency experiences during the recent drought period, the NAB RDCP and RWRP partners elected to limit the scope of vulnerability assessments to the water supply (municipal/industrial and agricultural) and environmental (in-stream natural resources) sectors. The NAB RDCP focused on identifying regional vulnerabilities to water supply and environmental resources resulting from a drought. As discussed in **Section 2.9**, the core of the vulnerability assessment focused on developing agency-specific Water Supply Portfolios. The assessment was conducted in four primary steps: (1) summarize available information, (2) develop initial water supply budget and vulnerability analysis, (3) meet with agency to confirm information and fill data gaps, and (4) update water supply budget and vulnerability analysis.

Through the vulnerability assessment process, a comprehensive list of vulnerabilities was compiled. The vulnerability assessment completed for the NAB RDCP provided a detailed analysis of drought-specific vulnerabilities. The RWRP goes beyond the drought-based scope of the NAB RDCP by evaluating a

broader set of vulnerabilities and mitigation strategies. The RWRP vulnerability assessment identified seven vulnerability "themes," each with multiple vulnerability categories (**Table 2-27**).

Table 2-27. Identified Vulnerability Themes and Categories

Vulnerability Theme	Vulnerability Category
1. Institutional threats to surface water availability	• Increasing constraints on CVP/Folsom Reservoir Operations • Evolving State and Federal Regulations • Agency Specific Water Rights/Contract Limitations • Allocation Shortages of CVP Supplies • Water Right Curtailments
2. Physical threats to surface water availability	• Climate Change/Hydrologic Variability • Inability to Divert during Low Storage/Flow Conditions • Source Contamination
3. Institutional threats to groundwater availability	• New Drinking Water Standards • New State Water Quality Regulations • Future Constraints Related to SGMA
4. Physical threats to groundwater availability	• Groundwater Contamination • Groundwater Production Capacity Limitations • Groundwater Injection Limitations
5. Institutional limitations on sharing supplies	• Existing POU/Service Area Limitations • Evolving State and Federal Requirements for Transfers • Disparity in Cost of Water • Diverse Agency Goals & Interests
6. Physical limitations on sharing supplies	• Differing Fluoridation Practices • Limited Intertie Capacities • Incompatible Pressure Zones • Differing water quality • Lack of metering on interties
7. Threats to infrastructure integrity	• Aging Infrastructure • Lack of redundancy for critical facilities • Geologic Hazards • Flooding Hazards
Other Challenges	• Reliance on single supply source • Unrealized recycled water potential • Limited capacity to serve growth • Lack of Real-time Data Sharing

Key:
CVP = Central Valley Project
POU = place of use
SGMA = Sustainable Groundwater Management Act

After a list of vulnerabilities were identified, participating agencies developed mitigation strategies to address those vulnerabilities. The steps for developing mitigation strategies included the following activities: 1) identify mitigation strategies; 2) screen of identified mitigation strategies; and 3) evaluate of retained mitigation strategies. The climate change vulnerabilities and mitigation strategies identified in the updated vulnerability assessments have been included in Sections **2.10.1** and **2.10.2** below.

Currently in development, the ARBS will further assess the water supplies and demands in the Region and address regional demand-supply imbalance and infrastructure deficiencies under the existing and future climate change conditions. The results of the ARBS will be used to refine and augment the mitigation

strategies described below. Other local and regional climate adaptation plans, such as the Placer County Sustainability Plan, will also be considered as they are finalized.

2.10.1.5. Prioritize Regional Vulnerabilities

The following are descriptions of the highest priority vulnerabilities in the Region.

Water Demand

- **Increased potential for summer water shortage** – The Region is vulnerable to increased summer water shortages from increased summer water demand, including potential increases in landscape water requirements and in agricultural crop water demand as a consequence of higher temperatures and increased levels of evapotranspiration. Currently, demand during summer months is as much as 50 percent higher than the monthly average calculated over 12 months; demand during winter months is as much as 50 percent lower than the average month (see **Section 2.9).** Warming temperatures and increased frequency and magnitude of extreme heat events will exacerbate this already increased summer demand, as experienced during the recent multi-year drought.

  Much of this seasonal increase in demand is due to higher landscaping irrigation demands during the summer months (Sacramento County 2011a). Agricultural production in the Region is an essential contributor to the local economy. In Sacramento County alone, agricultural production was valued at $507 million dollars in 2016 (Sacramento County Agricultural Commission 2016). A variety of crop types are grown in the Region, including row crops, tree crops, and irrigated grains. The existing crop mix has the potential to stay unchanged or change with time. Many of these crops are sensitive to climate change and will require increased irrigation during the dry season (Sacramento County 2011a). A secondary impact could be a decline in the agricultural economy. In 2015, the drought cost the agriculture industry in the Central Valley an estimated $2.7 billion (CARB 2017).

  The NAB RDCP vulnerability assessment showed that, consistent with demand patterns throughout the year, the greatest deficits during a drought would occur during summer months when demands are highest (PCWA et al. 2017). For the purposes of this vulnerability assessment, a Highly Restricted Supply scenario was developed to reflect a severe supply disruption situation in which one or more of an agency's primary water supply(ies) becomes unavailable for an extended duration during a drought. This scenario was beyond the requirements of UWMPs, vary for each agency depending on its water supply portfolio, and represented the most dire conditions whether due to drought, climate change, change in regulatory environment, etc. Each agency identified the

parts of its supply that were most vulnerable and the parts that were most reliable for purposes of determining the potential deficit. This only consider drought-related vulnerabilities. Under a highly restricted supply scenario, many agencies in the Region could experience deficits that would require significant additional customer conservation to achieve desired service levels and reliability of service going forward.

Water Supply

- **Reduced water supply reliability** – The Region is vulnerable to reduced water supply reliability from three primary drivers: reliance on snowpack, existing storage capacity limitations, and increased drought potential.

  American River runoff from April through July is dominated by snowmelt (see **Section 2.9**). Water supply in the Region relies heavily on the late season storage provided by snowpack. Most agencies in the Region dependent upon the American River have limited access to alternative water sources, such as the Sacramento River. Prolonged drought and reduced snowpack may cause institutional and physical threats to surface water availability, in addition to threats to groundwater availability, infrastructure integrity and the ability to share water supplies.

  Current regional reservoir operating conditions limit storage opportunities during winter runoff season; increased winter runoff will not necessarily translate into increased water stored in the spring, as releases must be made to meet flood management requirements. In the entire American River watershed (combined watersheds of the Lower American and the upstream watersheds of the American River), the ratio of storage to annual runoff is approximately 0.64, indicating the winter runoff is not likely to be stored (Roos 2005). In addition, less spring snowmelt will reduce the ability to refill winter reservoir flood control space during late spring and early summer of many years, reducing the amount of surface water available during the dry season (Roos 2005).

  The Region is projected to have more frequent, longer, and more-extreme heat waves and longer periods of drought (Sacramento County 2011a) which would reduce the reliability of regional water supplies from year to year. The 2012 to 2016 drought exposed the vulnerability of water agencies in the Region that rely solely on surface water. North of Delta CVP M&I allocations were reduced by 75 percent, whereas past planning efforts by local water agencies assumed no more than a 25 percent reduction in supplies during critically dry years (PCWA et al. 2017). In the ten-year period from 2007 through 2016, Folsom Reservoir dropped below 200,000 acre-feet three times, with its lowest ever recorded storage of under 135,561 acre-feet in December 2015 (PCWA et al. 2017).

While emergency pumps and barges could provide water at lower storage volumes (i.e. below 110,000 AF), water supply diversions would be substantially impacted. While such storage levels have never occurred, low storage in Folsom Reservoir appears to be increasing in frequency during droughts.

The spills observed at Folsom Dam following the intense winter storms that contributed to the end of the drought illustrate the system does not have the capacity to store significant amounts of water when they are available. From December 2016 through March 2017, the cumulative volume of water Folsom Dam released for flood control purposes could have filled the reservoir over four times, and the inflow to Folsom Reservoir over the course of the entire water year was approximately eight times its capacity.

Water managers in the Region continue to experience a growing imbalance between water demands and water supply due to a variety of factors, including population growth; increased regulatory requirements; changes in CVP operations; inadequate infrastructure; and lack of interagency planning necessary to address emerging climate change conditions, and increasingly intense and more frequent extreme events (droughts and floods). The imbalance will only increase with climate change.

Another threat to water supply is low flows in rivers, which could potentially reduce the amount and accessibility of surface water by agencies that divert directly from the American or Sacramento Rivers. River flows could become so low that surface water diversions could even be cut off. Agencies relying predominantly on these supplies would then need to rely on transfers from other agencies, all or in part, to meet demands. For example, the City of Sacramento identified this vulnerability as an ongoing concern because its ability to divert flows from its lower American River diversion are impacted when flows are below 500 cfs (PCWA et al. 2017). Similarly, on the Sacramento River, when flow drops below 6,000 cfs to 6,500 cfs, the capacity of its other diversion structure is reduced. Such low flows occurred during the recent drought. This vulnerability is likely to occur again, and would have at least a moderate impact on the City of Sacramento's supply.

- **Constraints on conjunctive use and water transfers** – Inhibiting regional reliability and resiliency to future drought and climate change impacts are limitations on increasing conjunctive use in the region. There are a number of factors that may inhibit expanded regional conjunctive use or inter-agency water transfers. The lack of interties between agencies limits both wet year in-lieu/injection and dry year recovery. In some cases, only a new valve and meter would be needed

to make an existing intertie capable for regular conjunctive use operations. On the other extreme, completely new interties and pipelines would need to be constructed to facilitate more sharing of supplies. Without a robust network of interties between surface water and groundwater using agencies, the ability to share water is limited. Differing fluoridation practices throughout the Region serve as another limitation to expanding regional conjunctive use. The NAB RDCP presented a map to identify each system's fluoridated practices. About half the agencies fluoridate their water while the other half do not. This is an issue for regular sharing of supplies, but typically does not limit supply sharing during emergencies and short-term applications (PCWA et al. 2017).

Limitations on groundwater production and injection capacity limit agencies' ability to participate in conjunctive use projects. Limitations in groundwater production was identified as a vulnerability by over a quarter of the agencies participating in the RWRP. Existing groundwater-using agencies stated that greater groundwater production would improve operational flexibility, and would put them in a better position to partner on conjunctive use projects. For example, current groundwater production for some agencies is only sufficient to meet existing demands of that agency and there is limited to no ability for exchange opportunities via groundwater substitution pumping in summer months with other agencies. In addition, lack of groundwater injection capacity prevents the use of available surface water in wet years for groundwater recharge as part of a conjunctive use program. Groundwater injection is regulated by the California Environmental Protection Agency through the Safe Drinking Water Act. Currently, only Roseville has the potential to inject surface water through its ASR Program. In the RWRP, Lincoln, RLECWD, SJWD's wholesale service area, and SSWD identified mitigation strategies to employ ASR p rograms which if implemented could potentially increase regional injection capacity around 16 TAF in wet years.

Water Quality

- **Reduced beneficial use of water from degraded water quality** – The Region is vulnerable to degraded water quality as a result of (1) increased contaminant loads from more frequent or intense storm events, and (2) rising surface water temperatures.

  While current water quality in the Region is generally characterized as good, storm events pose problems for water treatment due to increases in turbidity and disinfection byproduct precursors (Sacramento County 2010). Climate change is expected to increase the frequency and magnitude of extreme precipitation and runoff events, potentially increasing the occurrence of these water management challenges.

Water temperature is expected to generally rise in regional streams, lakes, and reservoirs as air temperature rises. This will adversely impact aquatic habitats and species (discussed below). For the Region, increasing temperatures are likely to increase challenges for providing suitable habitat conditions for salmonid populations, particularly fall-run Chinook salmon. Folsom Reservoir is operated to release cold water during the late summer and early fall months to provide suitable habitat conditions for anadromous fish survival. With a warming climate, the quantity of suitable cold water in storage is likely to decrease. At the same time, the need for these colder water releases is likely to increase due to warmer in-stream temperatures (Reclamation 2016a).

Prolonged droughts may threaten both surface water and groundwater quality. During dry periods, demand for groundwater is anticipated to increase as surface water availability decreases. Although not experienced in this area, heavily-pumped aquifers sometimes experience degradation in water quality due to concentrations of pesticides, fertilizers, salts, industrial pollutants, and other contaminants. This impacts not only available water supply, but also public health. Differing water quality may also impact the ability of agencies to share supplies during droughts, floods, or other events (PCWA et al. 2017).

Water quality differences between surface water and groundwater may also serve as a barrier to establishing a regional conjunctive use program. Some agencies have concerns about receiving lower quality groundwater from neighboring agencies as compared to their surface water. For example, Folsom has contracts with Gekkeikan and Kikkoman that allow only high quality surface water to be delivered to them. Roseville, among others, has similar limits to conjunctive use due to existing policies limiting groundwater for emergency use only and customer preferences.

Flooding

- **Increased riverine flood risk** – In the Region, major infrastructure, residences, and industries are currently located in the 200-year floodplain. Population growth and economic development behind levees in the Region has greatly increased flood risk over time. These issues are likely to be exacerbated, as climate change is expected to increase the frequency and magnitude of extreme precipitation and runoff events. Additionally, changes in storm magnitude may overwhelm potentially undersized internal drainage systems in the Region.

- **Increased tidal flood risk** – Tidally influenced levees in the southwestern portion of the Region will experience increased pressure under sea level rise scenarios. A rise in sea level would increase hydrostatic pressure on levees currently protecting low-lying land in the Delta, much of which is

already at or below sea-level. These effects threaten to cause potentially catastrophic levee failures that could inundate communities, damage infrastructure, and interrupt water supplies throughout the state (Hanak and Lund 2008). Sea-level rise may also cause issues with intakes or outfalls from water or wastewater treatment facilities.

Ecosystem and Habitat Vulnerability

- **Increased adverse impacts to habitats and species** – The Region includes substantial acreages of vulnerable and already fragmented wetland and aquatic habitats. The Region is also home to a number of climate-sensitive and state- and federally listed threatened and endangered species, including salmonids and migratory bird species. **Section 2.6.2** and **Appendix B** contain descriptions of existing vulnerable habitats and species within the Region. Agencies within the Region have numerous plans for restoration of these habitats in place, but these may be inhibited by a changing climate.

  In addition, warmer air and water temperatures potentially could improve habitat for invasive species that outcompete natives. Climatic changes could decrease the effectiveness of measures currently used to control invasive species (Hellman et al. 2008). Invasive species, including various nonnative fish and plant species, are an ongoing issue in the Region. Some invasive species, such as quagga mussels, may also impact maintenance of hydraulic structures.

  Existing quantified environmental flow requirements have been established to improve aquatic habitat, but these do not necessarily account for climate change. Water for prescribed flows may not be available at the correct time, or if available, may not be at the proper temperature, as described in **Section 2.6**. This may affect allowable diversions and water use downstream. A reduction in the amount of in-stream water available may lead to water quality impairments that affecting the health of aquatic species.

  Low flows in rivers can cause detrimental impacts to native and local species such as Chinook salmon and the Central Valley steelhead trout. The WFA and various regulatory requirements specify the maintenance of flow and temperature releases from Folsom Reservoir. Nevertheless, dry water years could reduce fish habitat (PCWA et al. 2017).

2.10.1.6. Quantitative Vulnerability Assessment

As part of the 2013 ARB IRWMP Update, the Sacramento Area Integrated Water Resources Model (SacIWRM) was used to evaluate the impacts of climate change on water resources in the Region.

SacIWRM is an integrated hydrologic model that simulates the groundwater and surface water resources in the Region. The model uses various input data, the most significant of which from a water supply perspective are: precipitation, streamflows, land use, agricultural and urban water demand, and surface water deliveries. The model also uses groundwater production data as inputs, where known (e.g., urban areas), but can simulate groundwater production data to meet demands in areas when the data are unavailable (e.g., rural and agricultural areas).

This climate analysis used information from DWR modeling exercises to evaluate future water deliveries under future climate change conditions. Applicable data from this broader DWR modeling effort were used as local inputs into the SacIWRM to assess potential impacts on the Region's surface water and groundwater resources. Because the data generated for the DWR analysis were for significantly different purposes than for the Region analysis, this is not intended to be a rigorous technical analysis. Rather, it meant to begin to provide an understanding of the expected magnitude of impacts potentially associated with future climate change. A technical memorandum of the modeling assumptions and results is provided in **Appendix D**.

Data extracted from the DWR analysis indicate there could be the following impacts:

- **Precipitation** – Monthly distribution of rainfall is expected to change under climate change conditions. March and December precipitation would increase by approximately 17 percent, while precipitation would be reduced in other months. The long-term average precipitation is expected to decrease by 7 percent.

- **Streamflow** – Changes in precipitation would result in similar changes in streamflows. American River annual flows would decline by an average of 8 percent, while the long-term average monthly reservoir releases would increase in March (+17 percent), April (+6 percent) and October (+23 percent) under climate change conditions. Similarly, Cosumnes River annual flows would decline by an average of 9 percent, but in contrast, the long-term average monthly Cosumnes River flows would only increase in December (+11 percent) under climate change conditions. Sacramento River annual flows would decrease by an average of 1 percent, while the long-term average monthly flows would increase in July (+4 percent), August (+8 percent), and October (+9 percent).

- **Surface Water Deliveries** – Changes in streamflows would result in significant changes in surface water deliveries from the American River and Folsom Reservoir. Changes in deliveries to each water supplier would depend on availability of surface water and water rights of the water supplier. The average annual surface water deliveries from the American River could typically be decreased by a range of 1 to 6 percent, while summertime decreases could be up to 12 percent. In contrast,

average annual deliveries on the Sacramento River could increase by approximately 2 percent because summertime flows could be increased.

Using the above information in the SacIWRM and running a 105-year future projection with an assumed 2030 level of development yielded the following potential impacts on the Region relative to a future condition with no expected climate change:[10]

- **Total Water Demand** – Average annual demand for water could increase by about 0.5 percent (an increase of more than 4,000 AFY). This is most likely due to the total amount and timing of precipitation to meet demands mostly in the agricultural sector.

- **Surface Water Supply** – Average surface water supply would be expected to be reduced by 0.8 percent (a nearly 5,000 AFY decrease). This is mostly associated with reduced availability of diversions from the American River for urban water suppliers.

- **Groundwater Supply** – For example, most of the supply to be made up by groundwater will be in agricultural areas that are already served primarily by groundwater. Without changes to current management activities, groundwater elevation declines in the range of 20 feet could be expected. However, with the development of GSPs under SGMA, such impacts will be ameliorated and overall basin sustainability requirements achieved. In urban areas nearer rivers and streams, the impacts to groundwater elevations could be fairly limited. Moreover, regional expansion of conjunctive use activities will similarly ameliorate estimated impacts from climate change that would otherwise occur.

The SacIWRM was used to run a second future scenario, in which urban water suppliers would receive a 10 percent cutback to their surface water diversions when inflows into Folsom Reservoir are less than 2,000 cfs. This cutback was added for the second scenario because DWR modeling indicated that the frequency of Folsom Reservoir inflows below 2,000 cfs was expected to increase under future climate conditions. Under this scenario, the following results are expected relative to future conditions with no expected climate change:

- **Total Water Demand** – Average annual demand for water could increase by about 0.5 percent (an increase of more than 4,000 AFY). This is most likely due to the total amount and timing of

[10] Due to the 2012-2016 California drought and the resulting water use efficiency that resulted, the projected annual water demands reported for the year 2015 are expected to differ significantly from what is to be reported in the year 2020 in the Urban Water Management Plans. The 2015 UWMP projections may materially overstate what will be actual demands for many agencies.

precipitation to meet demands mostly in the agricultural sector. These are the same results as for the first scenario, as no additional demand changes would be expected.

- **Surface Water Supply** – Average surface water supply would be expected to be reduced by 5.4 percent (a nearly 33,000 AFY decrease). Again, this is mostly associated with reduced availability of diversions from the lower American River for urban water suppliers. However, such reductions in inflow under this second future scenario would also likely further stress Reclamation's operations of Folsom Reservoir and its ability to ensure supply reliability for those agencies that receive deliveries directly from the lake.

- **Groundwater Supply** – To meet the increased total demand and reduced surface water availability, groundwater production is expected to increase by about 6.5 percent per year (an increase of more than 33,000 AFY). Groundwater elevation declines in agricultural areas would still be expected to be in the 20 feet range. In contrast to the first scenario, groundwater elevations in the urban areas could be expected to decline, as they are absorbing a majority of the reduced diversions. Groundwater elevation declines in the urban areas would likely be more in the range of 10 feet or more.

2.10.1.7. Further Data Gathering and Analysis

Based on the quantitative analysis above and experiences during the recent drought, impacts to localized areas that are heavily reliant on groundwater could be significant. Additionally, areas that are exclusively reliant on surface water could experience shortages, particularly if conditions similar to the second scenario were to materialize. Expanding conjunctive use operations in the Region will help address these concerns. RWA is working with local water suppliers on the following studies and data gathering efforts to continue to assess potential impacts and develop adaptive strategies to address concerns related to future climatic conditions:

- RWA will continue to coordinate with the groundwater management entities on tracking Region-wide changes in groundwater elevations through the California Statewide Groundwater Elevation Monitoring (CASGEM) program. RWA will continue to report to the RWMG on trends.

- RWA will continue to coordinate with the GSAs to comply with the SGMA and maintain groundwater storage levels.

- RWA will incorporate regional SWRPs and include stormwater as a resource in local integrated water management efforts.

- The RWRP identifies mitigation actions that would help expand conjunctive use. With near-term infrastructure improvements, there is a potential to increase region-wide recharge by 63 thousand acre-feet per year in wet years beyond the existing opportunity, and recovery by an additional 58 thousand acre-feet per year in dry years above existing opportunities. With the near-term improvements, both recharge and recovery has the potential to increase by about 50 percent. The cost to implement these improvements ranges from $150 to $250 million. Revenue from creating a groundwater bank could serve to offset some of the capital costs associated with facility improvements, including improvements that may have been implemented by local agencies regardless of a bank.

- In 2014, RWA completed a study with SMUD (the primary electric utility) to assess the water-energy relationship in the Region. The study identified areas where water and energy demands can be reduced, resulting in GHG emissions reductions. SMUD is using this information to inform investment decisions for demonstration projects that reduce energy demands associated with the Region's water systems or increase the use of renewable energy by the water sector, thus reducing GHGs. SMUD and RWA are collaborating on implementation of these projects. The study also helped to inform planning efforts and the development of projects that can address both adaptation and mitigation related to future climate conditions.

- In addition to the efforts described above, the ARBS was initiated in 2017, and it is intended to integrate the considerations of surface water and groundwater uses as well as environmental water needs in a way that may help the Region (including Reclamation) better manage all of its water resources into the future. Operational decisions will be improved with new information on climate change specific to the Region.

2.10.2. Climate Change Mitigation and Adaptation Strategies

Region stakeholders and participants recognize the importance of managing for climate change. Strategies to manage climate change include both mitigation and adaptation. Mitigation involves actions to reduce GHG emissions, while adaptation involves responding to the effects of climate change.

As part of the 2018 ARB IRWMP Update, RWA identified local climate action and sustainability plans. **Table 2-28** shows whether the counties and cities in the Region have developed or plan to develop a GHG emissions inventory and/or a plan that addresses climate change. These, and other regional climate action planning documents, are also identified in **Appendix F**. GHG emissions from water-related infrastructure

and projects and adaptation actions, such as water conservation, are integral components of many of these plans. Many ARB stakeholders have contributed to their respective city or county plans.

Table 2-28. GHG Emissions Inventories and Climate Change-Related Plans in the Region

Municipality or Agency	GHG Emissions Inventory	Climate Action Plan, GHG Emission Reduction Plan, or Related Plan
El Dorado County	Plan to do	Plan to do
City of Citrus Heights	Yes, conducted as part of Sacramento County-wide GHG emissions inventory	2011 City of Citrus Heights Greenhouse Gas Reduction Plan
City of Elk Grove	Yes, conducted as part of Sacramento County-wide GHG emissions inventory	2013 City of Elk Grove Climate Action Plan 2013 City of Elk Grove General Plan Update – Sustainability Element
City of Folsom	Yes, conducted as part of Sacramento County-wide GHG emissions inventory	2017 City of Folsom Sustainability Action Plan
City of Galt	Yes, conducted as part of Sacramento County-wide GHG emissions inventory	2017 Compilation and Analysis of Local Climate Action Plan Measures
City of Rancho Cordova	Yes, conducted as part of Sacramento County-wide GHG emissions inventory	Yes, in progress
City of Sacramento	Yes, done with Sacramento County plan	2012 City of Sacramento Climate Action Plan 2035 City of Sacramento General Plan Update – Sustainability Element

Table 2-28. GHG Emissions Inventories and Climate Change-Related Plans in the Region (contd.)

Municipality or Agency	GHG Emissions Inventory	Climate Action Plan, GHG Emission Reduction Plan, or Related Plan
Sacramento County	Greenhouse Gas Emissions Inventory for Sacramento County, 2009 and 2016	2009 Greenhouse Gas Emissions Inventory and Forecasts 2011 Climate Action Plan Strategy and Framework 2012 Sacramento County Climate Action Plan – County Government Operations Climate Action Plan – Communitywide Greenhouse Gas Reduction and Climate Change Adaptation (in-progress) 2015 Greenhouse Gas Emissions Inventory and Forecasts Update
City of Auburn	N/A	N/A
City of Lincoln	Yes, in progress	Yes, in progress
City of Rocklin	Yes, in progress	Yes, in progress
City of Roseville	City-operations Climate Action Plan, 2009; Community-wide Sustainability Action Plan, in progress	City-operations Climate Action Plan, 2009 2010 City of Roseville Community-wide Sustainability Action Plan
Town of Loomis	No plans	No plans
Placer County	Yes	Yes, in progress

Source: California Office of Planning and Research 2012, Citrus Heights 2011, Elk Grove 2013a, Elk Grove 2013b, Folsom 2017b, Galt 2017, Sacramento 2012, Sacramento 2015b, Sacramento County 2009, Sacramento County 2011a, Sacramento County 2012, Sacramento County 2015, Roseville 2009a, Roseville 2010
Key:
ARB = American River Basin
GHG = greenhouse gas

In addition to counties and cities, other agencies in the Region are involved in GHG emission reporting. The Climate Registry is a nonprofit organization that provides a nationwide database for consistent and transparent tracking/reporting of GHG emissions (http://www.theclimateregistry.org/). The following agencies in the Region are current members of this registry:

- PG&E
- Sacramento Metropolitan Air Quality Management District
- SMUD

Several water supply agencies have been progressive in developing GHG emission-related plans. For example, PCWA has completed an Energy and Greenhouse Gas Benchmark Study, which benchmarked PCWA's energy use, inventoried GHG emissions, and developed energy and GHG emissions options. Stakeholders and participants are already working to inventory GHG emissions and are contributing to reducing GHG emissions by reducing energy consumption, investing in renewable energy, purchasing carbon offsets, and conducting other mitigation-related actions. Folsom is currently conducting an energy efficiency analysis of the city's water and wastewater operations (M. Yasutake, personal communication, 2018). SJWD also completed an energy efficiency evaluation, which included an assessment of energy consumption, water rates, water loss, and potential to install solar panels.

Appendix C includes the results of an ARB water supply agency survey documenting GHG inventory and reduction efforts. The appendix contains a detailed list and descriptions of completed and planned mitigation strategies undertaken by survey respondents, as well as climate change mitigation strategies from local climate action plans.

In contrast to mitigation strategies, the intent of adaptation strategies is to have a water management system that is more adaptable to increasingly uncertain climate patterns and extremes. Actions that are already underway, such as conjunctive use, water conservation measures, and integrated flood management will also help the Region be more adaptable to climate change. These actions have been described throughout **Section 2**, and are also briefly described below. Additional mitigation strategies may be added following completion of the RWRP and ARBS.

- **Water demand reduction** – Reducing human water use increases water reliability during drier years and allows the same quantity of water to be available for other needs. Current efforts, such as decreasing urban per capita water demand, installing water meters, and public education (**Section 2.9.1**), help reduce water demand. However, there is some concern that demand hardening from continuous water demand reduction may limit a water supplier's ability and/or customer's willingness to respond to shortages in the future.

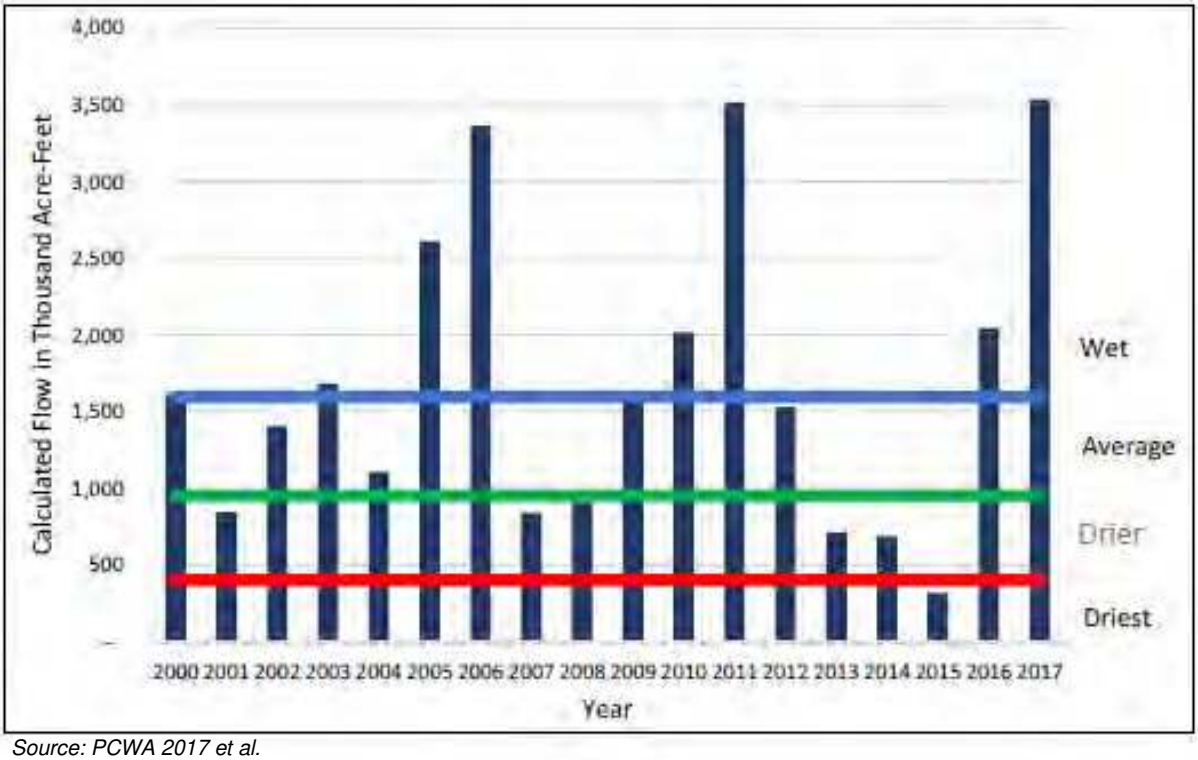
- **Water supply system improvements** – A more adaptable water supply system increases efficiency of water use, which will become more important with increasingly frequent and extremely dry years. Current efforts, such as conjunctive use management (**Section 2.6.3**), recycled water use (**Section 2.9.2**), and constructing interconnections between adjacent water districts (**Section 2.8**), increase water supply reliability in the Region. Creating recycled water opportunities may provide an additional source of water to meet non-potable demands and in the future, potentially potable

demands. New interties may be constructed to allow agencies to share water supplies across service area boundaries if a primary water source becomes unavailable, as occurred during the 2012 to 2016 drought. Injection wells may be constructed to recharge groundwater. Interbasin and intrabasin water transfer agreements may also be completed. For long-term regional water supply management, water managers will need to monitor both reservoir storage levels and snowpack. Once a water supply threat is identified, water agencies and managers must respond quickly.

- **Integrated flood management** – A comprehensive structural and nonstructural flood management system is necessary to adapt to the anticipated higher frequency and magnitude of flood threats. State (e.g., Central Valley Flood Management Planning Program) and local flood management efforts involve both structural improvement projects and consideration of floodplain easements and use of LID methods (**Section 2.7**).

- **Ecosystem stewardship** – Ecosystem- and environmental resources-related projects and supporting resilience of the environment will be increasingly important, as climate change also affects the environment. Numerous environmental and watershed management groups are active in the Region (**Section 2.6.2**), and nonstructural flood management projects and programs currently involve environmental habitat considerations (**Section 2.7**). The Lower American River Modified Flow Management Standard is a comprehensive package of linked actions to achieve two co-equal objectives of providing a safe and reliable water supply while also preserving the aquatic life of the lower American River (PCWA et al. 2017). Unimpaired inflow into Folsom Reservoir is an index that water managers can reference to measure the potential amount of water supplies that maybe available for a given year, per the WFA. Since execution of the WFA, one-third of years (6 out of 18) have been classified as drier or driest (**Figure 2-34**). Based on the water year type, agencies may proactively take specific actions in anticipation of potential water supply shortages.

- **Watershed stewardship** – Management of water resources from a watershed perspective is integral to promoting integrated management of resources for water supply, flood/stormwater management, and ecosystem needs. Numerous environmental and watershed management groups are active in the Region (Section 2.6.2).



Source: PCWA 2017 et al.

Figure 2-34. Calculated Unimpaired Inflow into Folsom Reservoir, March-November

- **Regional water transfers** – Developing and expanding water transfer agreements, particularly intrabasin transfer of CVP contract supplies, would facilitate sharing of supplies and enable agencies to receive additional supplies under drought or emergency conditions (PCWA et al. 2017). Inter-agency transfer agreements may also increase operational flexibility and identify additional opportunities for supply transfers to expand conjunctive use. Addressing distribution system pressure differences amongst agencies and adding new interties would increase the ability to share supplies. Modifying contracts and/or expanding POU would also help facilitate sharing of supplies. Improving flexibility to share supplies would help some agencies access alternative supplies should their primary water sources become unavailable or for expanding regional conjunctive use opportunities.

- **New surface water diversions** – New surface water diversions could provide redundancy of supplies should the current Folsom Reservoir intake become inoperable, including as a result of low lake levels. A permanent alternative emergency intake at Folsom Reservoir would improve the reliability of Folsom Reservoir supplies. Also, a new river diversion on the Sacramento River would reduce reliance on the American River supplies, and increase drought resiliency by providing access to an alternative source of surface water supplies.

- **Groundwater banking** – Increasing conjunctive use and groundwater banking would also increase the ability of groundwater basins throughout the Region to provide dry year supplies. Groundwater banking agreements, including establishing a regional groundwater bank, would facilitate regional collaboration (PCWA et al. 2017). It would also facilitate collaboration with Reclamation to integrate Folsom operations with the regional groundwater basins to enhance drought resiliency and protection of environmental resources on the lower American River. GSPs may identify additional opportunities to enhance groundwater recharge and store water for use during dry years, while maintaining basin sustainability.

Climate change mitigation and adaptation strategies are also an important part of the IRWMP. ARB strategies were designed to be flexible and adaptable so that climate change, among other future changes in the Region, can be addressed. New strategies can be proposed and vetted into the IRWMP every quarter. GHG emissions reduction and/or climate change adaptation components of ARB projects are also considerations in the project review process. These IRWMP Framework elements are described in greater detail in **Sections 5.6** and **5.7**.

2.11. Technical Analysis

This subsection describes the technical information and analysis used in development and update of the ARB IRMWP. RWA, as the RWMG, and ARB stakeholders used this information to understand regional water resources conditions (**Section 2**); to update ARB vision, goals, objectives, and strategies (**Section 5**); and to revise means of implementing the IRWMP into the future (**Section 6**). The discussion below provides a summary of the technical data and information sources and the technical analyses used. Monitoring and collecting data from IRWMP implementation and data management into the future are discussed in **Sections 6.3** and **6.4**, respectively.

2.11.1. Technical Data and Information

The water resources systems within the Region have been extensively studied and monitored for many years. Data for ARB IRWMP were collected from local, regional, state, and federal agencies. Information from local agencies often provides the level of detail that larger scale studies do not. Selecting to use plans, such as UWMPs, that are mandated or supported by the state, ensures that the information collected from numerous local agencies was compiled following similar standards, for similar purposes, and in a similar time frame. Many local agencies in the Region also collaborate to develop regional plans and efforts, such as GMPs/GSPs, SWRPs, the NAB RDCP, the RWRP, ARBS, American River Basin Water Marketing Strategy Project, or other studies. The scale of information in these documents is ideal for an IRWMP and

the data have been vetted by several local agencies. A list of identified local water plans can be found in **Appendix F**.

State and federal data were used when they provided sufficient detail (e.g., demographics) or when a statewide perspective was important (e.g., flood management systems). In cases where various local agencies provided differing information (e.g., surface water quality issues in the Region), state or federal sources were used as the neutral and accepted information.

Uncertainties in data do exist, especially since this IRWMP is a synthesis of data from numerous sources that report similar information, possibly collected in different ways. In some cases, different sources do not fully agree with each other. Nonetheless, the data are accurate enough that they portray the overall picture of the Region.

An overview of the data and information used to support the ARB IRWMP is shown in **Table 2-29**.

Table 2-29. Data Used in the 2018 ARB IRWMP Update

Section	Type of Data	Sources
2.1-2.4	Political and agency boundaries	Cal-Atlas; 2010 U.S. Census
2.5	Population, finance, and demographic data	2000, 2008, 2010, and 2016 U.S. Census; 2018 and 2012 SACOG data; State of California Department of Finance, State of California Employment Development Department 2018
2.5	Land-use data	California Department of Conservation data; 2017 Cropland Data Layer, USDA National Agricultural Statistics
2.6	Hydrologic (surface and groundwater) and climatic data	GMPs/studies; USDA NRCS watershed delineations; CIMIS; Western Region Climate Change, USGS, and DWR/CDEC gage data; relevant watershed studies, including NMFS studies.
2.6	Surface and groundwater quality data	Agency data; GMPs/studies; U.S. EPA 303(d) list for impaired waters, Water Board beneficial use data; SGA
2.6	Ecosystem and habitat data	Habitat conservation plans, CDFW CNDDB, local watershed management plans and studies.
2.7	Stormwater and flood data	SWMPs; DWR, flood-related documents; and other city or county hazard management plans, SWRPs
2.8	Water and wastewater system data	2015 UWMPs; sewer system master plans, and related studies and projects
2.9	Water supply, demand, and reliability information	2015 UWMPs and other agency water supply plans; GMPs/studies; NAB RDCP; RWRP
2.10	Climate change data and relevant efforts	GHG inventories, climate action plans, NAB RDCP 2017, RWRP 2018

Note:
Much of the data have been augmented by personal communications or stakeholder/agency input.

Key:
CDEC – California Data Exchange Center
CDFW – California Department of Fish and Wildlife
CIMIS – California Irrigation Management Information System
CNDDB – California Natural Diversity Database
DWR – California Department of Water Resources
GHG – greenhouse gas emissions
GIS – geographic information system
GMP – groundwater management plan
NAB RDCP= North American Basin Regional Drought Contingency Plan
NMFS – National Marine Fisheries Service
NRCS – National Resources Conservation Service
SACOG – Sacramento Area Council of Governments
SWMP – stormwater management plan
SWRP – Storm Water Resources Plan
U.S. EPA – U.S. Environmental Protection Agency
USDA – U.S. Department of Agriculture
USGS – U.S. Geologic Survey
UWMP – urban water management plan

Some of the regional and local water plans and studies cited in **Table 2-29** are described below.

- **Urban Water Management Plans and Studies** – Documents that provide information about the Region's water supply outlook and related management strategies include 2015 UWMPs. The 2015 UWMPs were prepared by each of the Region's urban water suppliers with greater than 3,000 connections or that serve at least 3,000 AF annually. UWMPs are updated every 5 years and include historical water use information and 20-year projections of water demands, water supplies, recycled water use, and a water shortage contingency plan. Additionally, the 2015 UWMPs contained each supplier's water conservation targets to meet the SB X7-7 requirements of 20 percent water conservation by 2020.

- **Groundwater Management Plans and Studies** – The Region is actively managing its groundwater resources through planning and monitoring efforts. GMPs completed or updated in the Region include: the Western Placer County GMP, the North American River Basin GMP, the Central Sacramento County GMP, and the South Basin. These plans define basin management objectives (BMO) necessary to maintain the quality, reliability, and sustainability of groundwater resources on local and regional scales. These BMOs complement the IRWMP objectives. GSAs throughout the Region are currently developing GSPs or alternative plans to GSPs (Alternatives) to sustainably manage the basins' groundwater resources. The GSPs or Alternatives will describe conditions in the basins and identify sustainable management actions and projects. Groundwater basins in the Region must be managed by a GSP by January 31, 2020. All other basins designated as high- or medium-priority must be managed under a GSP by January 31, 2021. Development of these GSPs is addressed as a 2018 ARB IRWMP Update strategy (**see Section 5.6**). Although GSP management actions were not identified during the 2018 ARB IRWMP Update, they will be incorporated throughout future integrated water management planning efforts.

- **Recycled Water Plans and Studies** – The Region is diversifying its water supply portfolio through the use of recycled water. Several agencies supply recycled water that offsets potable water use or provides other beneficial uses. These agencies completed studies and projects over the past decade that contributed technical data used in the ARB IRWMP.

- **Stormwater and Flood Management Plans and Studies** – Several stormwater and flood management planning efforts have been completed or are underway in the Region. The American River Basin SWRP and the West Slope SWRP were recently completed and aim at integrating stormwater in their ongoing integrated regional water management efforts. These efforts identify opportunities for and benefits of enhancing storm and flood management systems. Stormwater-related plans provided information on current stormwater management systems and the NPDES permits relevant to the Region. Local flood management plans identified local flooding concerns as well as augmented watershed descriptions of local creeks. Understanding of both local stormwater and flood management will assist implementation of any water quality- and LID-related objectives and strategies.

- **Watershed and Habitat Conservation Plans and Studies** – Several watershed and habitat conservation planning efforts have been completed or are underway in the Region. The ARB IRWMP objectives and strategies reflect some of the concerns and initiatives identified in these planning efforts. Habitat Conservation Plans (HCP) and related efforts established regional

conservation and development guidelines to protect natural resources while improving and streamlining the permitting process for endangered species and wetland regulations. By proactively addressing the Region's long-term conservation needs, these efforts strengthen local control over land use and provide greater flexibility in meeting water management and other needs in the Region. HCPs and related plans provide species and habitat information to guide future efforts in regional habitat and species management.

2.11.2. Technical Analyses and Methods

Several components of this ARB IRWMP required more in-depth analysis or data management methods than compiling information from other studies and data sets. As part of the 2013 ARB IRWMP Update, RWA conducted a quantitative climate change vulnerability analysis. This involved combining information from DWR's CalSim model with the SacIWRM to assess the effects of climate change on the surface water and groundwater resources. The results of this analysis, described in **Appendix D**, provided information about how future climate conditions could change water supply reliability, stream flow, and groundwater levels.

To develop this IRWMP and to assist continued implementation into the future, RWA continues to update and use a Web-based Opti tool. This tool acts as a database of ARB project information, as well as a means to share water-related information, events, and projects with the regional community. Opti also allows quick analysis of current ARB projects throughout the Region. This tool is described in further detail in the following sections: its role in stakeholder outreach and collaboration in **Section 3**, its role in collecting project information in **Section 5**, and its role as a data management tool and adaptable tool into the future in **Section 6**.

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Section 3
Planning Coordination and Integration

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Abbreviations and Acronyms

ARB	American River Basin
CABY	Cosumnes, American, Bear, Yuba
Caltrans	California Department of Transportation
CVFPP	Central Valley Flood Protection Plan
DAC	disadvantaged community
DCIP	Disadvantaged Community Involvement Program

Delta	Sacramento-San Joaquin River Delta
DWR	California Department of Water Resources
EID	El Dorado Irrigation District
EJ	environmental justice
GBA	Groundwater Banking Authority
GSA	groundwater sustainability agency
GSP	groundwater sustainability plan
IRWM	integrated regional water management
IRWMP	Integrated Regional Water Management Plan
MAC	Mokelumne/Amador/Calaveras
MHI	median household income
MOU	Memorandum of Understanding
NAB RDCP	North American Basin Regional Drought Contingency Plan
NCMWC	Natomas Central Mutual Water Company
NSV	Northern Sacramento Valley
PCWA	Placer County Water Agency
PDF	Portable Document Format
PRC	Public Resources Code
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
Region	ARB Region
RFMP	Regional Flood Management Plan
RWA	Regional Water Authority
RWMG	Regional Water Management Group
RWRP	Regional Water Reliability Plan
SACOG	Sacramento Area Council of Governments
SAFCA	Sacramento Area Flood Control Agency
SAWC	South Area Water Council
SB	Senate Bill
SCGA	Sacramento Central Groundwater Authority
SCWA	Sacramento County Water Agency
SGA	Sacramento Groundwater Authority
SGMA	Sustainable Groundwater Management Act
SRCSD	Sacramento Regional County Sanitation District
SRFA	Sacramento River Funding Area
SSCAWA	South Sacramento County Agricultural Water Authority
state	state of California
SWRP	Stormwater Resource Plan
UAIC	United Auburn Indian Community
WDCWA	Woodland-Davis Clean Water Agency
West Sacramento	City of West Sacramento
Westside-Sac	Westside-Sacramento
WET	Water Education Today
WFA	Water Forum Agreement
WRA	Water Resources Association
WSAFCA	West Sacramento Area Flood Control Agency

3. PLANNING COORDINATION AND INTEGRATION

This section describes stakeholder involvement and coordination efforts related to the development and implementation of the American River Basin (ARB) Integrated Regional Water Management Plan (IRWMP). It outlines the processes that were used to solicit and coordinate stakeholder involvement in plan development, which includes water stakeholders, the public, disadvantaged communities (DAC) and tribes. The section also describes the relationship between the IRWMP effort and efforts of local water and land-use planning, neighboring integrated regional water management (IRWM) regions, and state of California (state) and federal planning.

3.1. Stakeholder Involvement

Stakeholder participation is an integral part of the local and regional planning process; including development of the ARB IRWMP. Stakeholder involvement has provided a forum for collaboration, data sharing, and soliciting feedback from interested or affected individuals and agencies in the ARB Region (Region). Collaborative efforts have helped to ensure that diverse interests of the Region are represented during the development and implementation of the ARB IRWMP. These efforts have also led to the development of partnerships that have assisted in the resolution of many of the Region's water management issues.

3.1.1. History of Regional Cooperation

Stakeholder involvement and participation in the ARB IRWMP is built upon the Water Forum's foundation of collaborative planning. The Water Forum process was the initial effort in the Region that focused on developing collaborative, consensus-based solutions and a broad involvement process, a process that pioneered in 1993 to 2000. Since then, the Water Forum process has become an accepted standard and norm for conducting stakeholder interaction and collaboration in the Region.

The current stakeholder participation process takes advantage of the knowledge and stakeholder relationships developed over more than 25 years in the Sacramento region. The Water Forum successfully joined together urban public agencies and municipalities along with water supply, industrial, agricultural, agricultural-residential, environmental, flood, businesses, and other community interests in an agreement to secure the future of the Sacramento region water supply to the year 2030. Signed by 40 stakeholder organizations in April 2000, the Water Forum Agreement (WFA) helped launch key programs and initiatives that continue to support the maintenance of the long-term sustainable yield of the North and Central Area groundwater basins (current jurisdictions of Sacramento Groundwater Authority [SGA] and Sacramento Central Groundwater Authority [SCGA], and other local groundwater sustainability agencies

(GSA)), conservation of municipal and industrial water use, and protection of fish and other public trust resources in the lower American River.

The ARB IRWMP effort began in April 2004, before initial California Department of Water Resources (DWR) guidelines for IRWMPs and their subsequent modifications to broaden the list of recommended stakeholders. As a result, the effort that led to the adopted 2006 ARB IRWMP focused primarily on water supply-related agencies and their projects to implement the WFA. Therefore, the initial group of potential participants in the IRWMP was composed primarily of the water suppliers involved in the Water Forum process, with limited involvement from other stakeholder groups. Ultimately, 16 agencies directly participated in the 2006 IRWMP effort. The 2013 ARB IRWMP Update built on the relationships developed among water supply interests and water purveyors during the Water Forum and 2006 IRWMP by greatly expanding the number and types of stakeholder groups involved.

The current 2018 ARB IRWMP Update continues to build on these relationships and seeks to represent a broad and balanced representation of the water community. Agencies representing the interests of flood managers, environmental groups, community based organizations, stormwater managers, disadvantaged communities, and water quality interests participated in the 2018 ARB IRWMP Update.

3.1.2. Stakeholder Outreach Process

This section describes the process for facilitating stakeholder involvement in the ARB IRWMP process.

3.1.2.1. Stakeholder Identification and Notification

Past outreach efforts included, but were not limited to, Regional Water Authority (RWA), Freeport Regional Water Authority, South Sacramento County Agricultural Water Authority (SSCAWA), SGA, and the Water Forum Successor Effort. Outreach efforts to include stakeholders in the 2018 ARB IRWMP Update built on the foundation of these programs, and the 2006 and 2013 ARB IRWMPs. Participants in this Region have a well-established tradition for meaningful stakeholder involvement and public information. In the past, a variety of strategies and tactics were employed to initiate engagement of stakeholders; including studying regional industry and association membership lists, advertisements in publications and periodicals (local, regional, and statewide), focus groups, and hiring public outreach consultants.

The 2018 ARB IRWMP Update process has employed multiple public outreach mechanisms and processes to notify and encourage involvement from interested stakeholders in the planning effort, including:

- Posting to the IRWMP page on the RWA Web site (www.rwah2o.org) and to the ARB IRWMP Web portal (http://irwm.rmcwater.com/rwa/login.php), which is described further below.

- Periodically briefing the RWA Board of Directors at their bi-monthly meetings.

- Briefing the Water Forum Successor Effort. This effort regularly convenes the diverse interest groups involved in the Water Forum process, operated continuously since 1993.

Stakeholders involved in the 2018 ARB IRWMP Update are shown in **Table 4-1** of **Section 4**. Other stakeholders beyond that list may be involved with participation in public meetings and other outreach conducted throughout the ARB IRWMP implementation process. New stakeholders will continue to be identified and invited to participate in the future.

3.1.2.2. Stakeholder Participation

The ARB IRWMP offers a variety of ways for interested stakeholders to engage in the planning process; including the Planning Forum and a dedicated Web portal also known as "Opti" (described below and in **Section 5.7.1**). Planning Forum meetings are open, accessible, and ongoing, and stakeholders can voice concerns or make suggestions about the plan and its development process. The approach used is flexible and responsive. Interested parties are continuously identified and encouraged to be involved in these meetings. Through the Planning Forums, RWA has convened four workshops with over 30 agency participants and over 50 distinct individuals for the development and refinement of the 2018 ARB IRWMP Update.

As also described in **Section 5**, ARB stakeholders assisted in collaboratively developing and updating the Region's vision, goals, principles, objectives, and strategies. Several objectives and strategies under the goal of community stewardship address the Region's direction concerning stakeholder outreach in the coming years. These are:

- **Objective 15:** Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.

- **Objective 17:** Increase sharing of information, studies, and reports to further advance integrated regional water management.

- **Strategy CS2:** Identify, summarize, and discuss the potential for partnering of existing regional outreach and education programs by 2021.

- **Strategy CS7**: Increase engagement of agricultural stakeholders and private water users.

3.1.2.3. Web Portal

RWA developed and maintains a Web-based tool or Web portal to collect and disseminate information on projects proposed in the Region. Having an Internet-based tool allows greater access to, and better control of, information. The Web portal, an application called Opti, supports collaboration and communication among stakeholders. The primary functions of Opti are:

- Sharing information
  - Opti provides a central location for sharing information about upcoming regional meetings, events, and progress of integrated planning and implementation.
- Collecting and displaying project information and data
  - Opti is the mechanism by which RWA collects project information. This information includes a project description, a point of contact, expected benefits, feasibility, costs and funding, status, and other considerations. The collected information will be used for evaluating and prioritizing the projects. Project information is displayed visually and geographically using a geographic information system-based platform. Projects on these maps are color-coded to show the primary benefit, such as water supply, water quality, environmental, flood/stormwater management, and community stewardship. Any vetted project prioritization scores will be visible as well. This project prioritization process is described in **Section 5.7**.
  - California Senate Bill (SB) 985, enacted in November 2014, requires that agencies prepare a Stormwater Resource Plan (SWRP) as a condition of receiving funds for stormwater and dry weather runoff capture projects from any bond approved by voters after January 2014. SWRPs for the Region and West Slope area of El Dorado County are included in the 2018 ARB IRWMP Update. New in 2018, Opti now includes a tab to collect information on stormwater-related projects for vetting and inclusion in the 2018 Update.
- Managing project data
  - The Region uses Opti to easily update and maintain the latest project data and information. The interface has also proven to be cost efficient over time, as the previous method of requesting and receiving projects through a fillable Portable Document Format (PDF) form was labor intensive for both the project proponents and RWA. Finally, the interface continues to ensure

that regional planning is a living process by allowing for the addition, evaluation, and prioritization of projects on an ongoing basis.

- Building a community
  - With the sharing of information, Opti fosters collaboration and provides more opportunities for planning, project integration, and identification of potential cost and resource sharing. Users are encouraged to add content to Opti, and they are given the option of receiving announcements from the Web portal about upcoming events or announcements.

Opti can be accessed at http://irwm.rmcwater.com/rwa/login.php. Users sign up for access to the site or can enter as a guest. By signing up as a community member, users can add content to the site. This feature allows for RWA to act as a site administrator and ensure that information is secure and shared appropriately. **Figures 3-1** and **3-2** are screenshots of Opti.

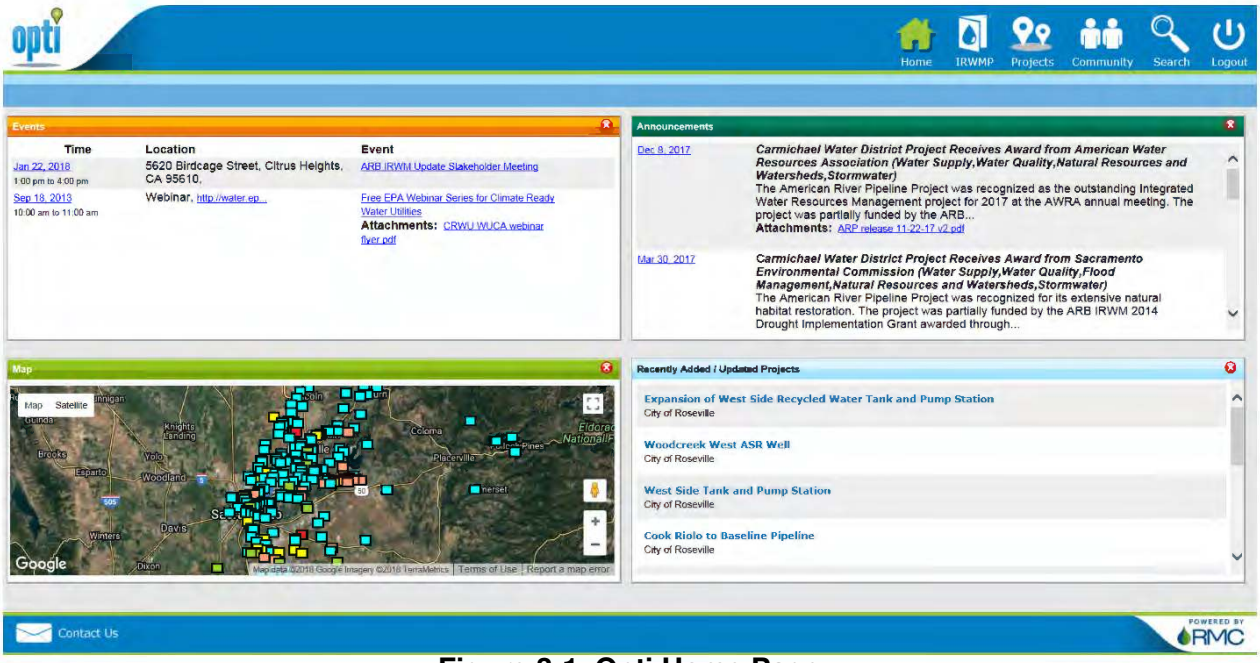

Figure 3-1. Opti Home Page

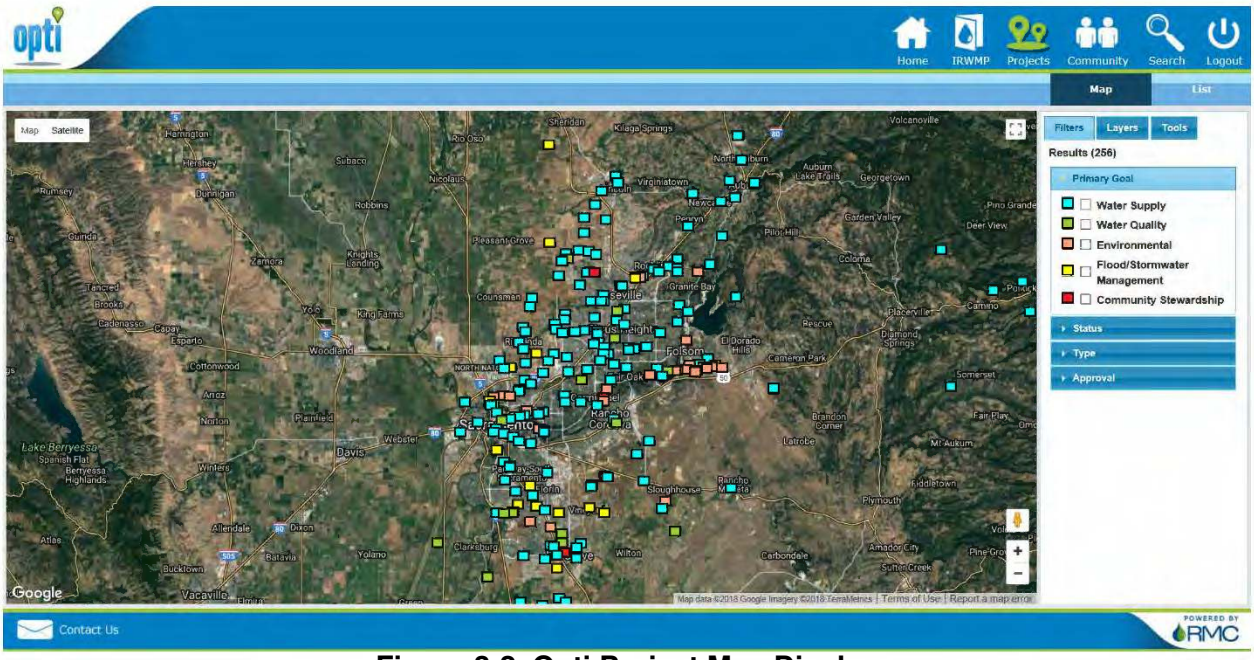

Figure 3-2. Opti Project Map Display

3.1.3. Public Outreach

The ARB IRWMP is an integral part of a comprehensive and coordinated water management program at a local and regional level. As such, more general outreach to the public and stakeholders on water issues, specific project proposals, and regional water conditions also serves the objectives of the IRWMP. RWA and other members of the Regional Water Management Group (RWMG) conduct or participate in dozens of outreach events and activities over the course of a year. Examples include:

- **Public Events**: Creek Week, Earth Day, Home and Garden Shows, U.S. Department of the Interior, Bureau of Reclamation (Reclamation) Get WET (Water Education Today), American River Salmon Festival.

- **Presentations to Community and Professional Groups**: American Basin Council of Watersheds, Sacramento Environmental Commission, McClellan Restoration Advisory Board, California Association of Park and Recreation Districts, Region II.

- **Websites**: The RWA Website disseminates information about the plan to the broader public and keeps participants informed between meetings. The Opti Web portal promotes active engagement of stakeholders in the ARB IRWMP community.

- **Regional Water Efficiency Program**: One of the most important water issues to engage the public in is water efficiency. Through individual efforts of water purveyors and the Regional Water

Efficiency Program managed by RWA, a comprehensive outreach campaign is conducted for the Region's residents to educate them on the importance of water efficiency to ensure a sustainable future.

- **Other**: RWA continually seeks out opportunities to outreach to the public and stakeholders on water issues in general and the ARB IRWMP in particular. RWA staff and RWMG participants frequently address public bodies, including city councils and county boards of supervisors.

As with stakeholder outreach, several objectives and strategies under the goal of community stewardship also address the Region's direction concerning public outreach into the coming years. These are further described in **Section 5** and include:

- **Objective 15**: Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.
- **Strategy CS1**: Increase availability and access to educational material on sustainable water resources.
- **Strategy CS2**: Identify, summarize, and discuss the potential for partnering of existing regional outreach and education programs by 2021.
- **Strategy CS6**: Increase engagement of community leaders (e.g., using community-based social marketing where applicable).

3.1.4. Outreach to Disadvantaged Communities

DAC is a term defined by the California Public Resources Code (PRC), Section 75005(g). "Disadvantaged community" means a community with a median household income (MHI) less than 80 percent of the statewide average. "Severely disadvantaged community" means a community with a median household income less than 60 percent of the statewide average.

Related to DACs are environmental justice (EJ) concerns. As defined by the U.S. Environmental Protection Agency, "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."

In many parts of California, DACs are underserved by water infrastructure or disproportionately impacted by negative environmental consequences resulting from industrial, municipal, and commercial operations.

For that reason, special emphasis is placed on ensuring DACs and EJ communities have an opportunity for meaningful involvement in the IRWMP process.

The ARB DAC program includes all subregions within the planning area containing neighborhoods with a MHI below $49,191, 80 percent of the statewide MHI for the time period of 2010 through 2014 (DWR 2016a). Outreach benefits DACs via improved understanding of what potential IRWMP projects may meet critical DAC needs. In general, delineation of DAC communities has been evaluated by Census tract, which is shown in **Figure 2-10** along with the water supply agencies that serve those areas. Even so, the California PRC is not specific as to how DACs are delineated, so different methods of determining the boundaries of a DAC can be considered valid by DWR.

3.1.4.1. Key DAC/EJ Findings

Based on an analysis of the Census tracts and jurisdictional maps, and unlike some parts of the state, DACs in the Region are generally not isolated communities with particular water supply or water quality concerns. In contrast, other regions have communities like Seville, where the average yearly income is $23,000 (DataUSA n.d.) and residents pay twice for water: once for the tap water they use only to shower and wash clothes, and twice for the 5-gallon bottles they must buy weekly for drinking, cooking, and brushing their teeth due to severe contamination (Brown 2012).

The water supply and water quality needs of DACs in the Region are generally served effectively by water purveyor efforts to provide high-quality water supplies to their entire service area and through the regional planning efforts described in this document. Under this structure, DACs are continuously represented through their elected representatives to water district boards, city councils, and county boards of supervisors.

That said, some DACs or individuals that would be considered disadvantaged reside in very small pockets of the Region, served by a small water system and/or private wells. According to the EPA a very small public water system serves a population less than 500 people, a small public water system serves a population of 501 to 3,300 people, a medium public water system serves a population of 3,301-10,000 people, a large public water system serves a population of 10,001-100,000, and a very large public water system serves a population of more than 100,000 people (EPA 2018). The use-types are divided into the following:

- A Community Water System is a public water system that has 15 or more service connections used by year-long residents or regularly serves at least 25 year-long residents of the area served by the system.

- A Non-Transient-Non-Community Water System is a public water system that is not a community water system that regularly serves at least 25 of the same persons during 6 months of the year.

- A Transient-Non-Community Water System is a non-community water system that does not regularly serve at least 25 of the same persons during 6 months of the year.

Areas of special consideration include schools serviced by these systems, due to the characteristics of the population at risk. Other special situations include facilities like truck stops or tourist locations where exposure to substandard water and sanitation may be minimal for most users, but not all. In the Region, issues with small systems water supply and sanitation are generally related to substandard, aging infrastructure, rather than larger regional issues.

The Sacramento County Environmental Management Department is involved with the permitting, inspection, and monitoring of 154 small public water systems. In Placer County, there are 158 small systems, which include many systems outside of the Region in the Cosumnes, American, Bear, Yuba (CABY) and Tahoe-Sierra regions. Some of those servicing mobile home parks and developments, particularly in the area of Auburn, are in DAC zones, with some additional ones being primarily isolated facilities, such as California Department of Transportation (Caltrans) rest stops or campgrounds. There are no reported problems from any of these locations in the Region; however, monitoring will continue to determine if locations exist with specific issues that should be considered at the IRWMP level.

Regardless of specific issues, the Region recognizes the need for the DAC/EJ community to participate in the IRWMP process, and the Region has a continued commitment to collaborate DAC/EJ members and advocates. For that reason, additional effort was made to identify specific options for direct DAC/EJ participation by community members or advocate organizations.

3.1.4.2. General DAC Outreach Approach

As part of the 2013 ARB IRWMP Update development process, a general approach to DAC outreach was developed to support the ARB IRWMP effort.

1. Determine existing DAC interest and efforts within RWMG members (RWA members) and leverage efforts in support of the IRWMP.

2. Determine existing DAC interest and efforts within ARB stakeholder groups that can be leveraged to support outreach and involvement.

3. Prepare and maintain a DAC contact and mailing list to encourage participation.

4. Encourage ARB stakeholders and project proponents to identify project(s) with potential to address DAC needs.

5. Provide RWA staff and/or members as speakers for any interested community group that would like to know more about the IRWMP or DAC participation.

6. Invite DAC representatives to participate in stakeholder meetings and events.

Appendix E contains the DAC and EJ Outreach Report prepared during the 2013 ARB IRWMP Update with the steps taken by the Region to understand DAC/EJ concerns and conduct outreach.

3.1.4.3. Additional Disadvantaged Community Involvement Actions

In July 2016, DWR began its Disadvantaged Community Involvement Program (DCIP), which included grants awarded on a funding area basis to support the following objectives as stated in the 2016 Disadvantaged Community Involvement Request for Proposals:

- Work collaboratively to involve DACs, community-based organizations, and stakeholders in IRWM planning efforts to ensure balanced access and opportunity for participation in the IRWM planning process.

- Increase the understanding, and where necessary, identify the water management needs of DACs on a Funding Area basis.

- Develop strategies and long-term solutions that appropriately address the identified DAC water management needs.

RWA has been engaged with efforts in both the Sacramento River Funding Area and the San Joaquin River Funding Area and is committed to participating in this process. As of completion of this update to the 2018 ARB IRWMP Update, that work is still ongoing. RWA will integrate results of the DCIP into its future implementation of the ARB IRWMP.

3.1.5. Outreach to Native American Tribes

The ARB IRWMP appreciates the importance of water from a physical and cultural perspective to Tribal communities within the planning region. The Region has two federally recognized Tribes. These include the United Auburn Indian Community of the Auburn Rancheria (UAIC) and the Wilton Rancheria. RWA contacted these Tribes via an invitation letter in June 2011 and extended an invitation to participate in the IRWMP development. Additionally, RWA contacted a consultant to discuss UAIC water resource-related

issues in May 2011. No issues were identified at that time. As part of the DCIP described above additional outreach is being planned for Tribal engagement for the entire Sacramento River Funding Area. That work is expected to commence in mid-2018 through the California Indian Environmental Alliance. RWA will consider the results of that effort in its future implementation of the ARB IRWMP.

3.1.6. State Agency Assistance

DWR plays an important role in developing the ARB IRWMP. DWR has participated frequently in the planning forum, providing clarifications on the state perspective for this IRWMP effort. DWR guidance was also important for developing the "Resolution of Adoption" document, which each project proponent must sign if it wishes to be a part of any state funding opportunity.

3.2. Relationship with Local Water Planning

Many local agencies within the Region have water supply, water quality management, wastewater collection and treatment, flood management/control, and stormwater management responsibilities. **Table 4-1** (**Section 4**) shows local agencies in the Region that have statutory water management responsibilities. Not all agencies with local water management responsibilities are active participants in this IRWMP effort, but most of these agencies have coordinated with the RMWG in the past and are expected to do so in the future as needed. This IRWMP provides a regional planning framework as described in **Section 5**, but it is not meant to supersede the autonomy or authority of any local agency. The planning framework includes a regional vision, principles, goals, objectives, and strategies, which were all developed and updated with extensive stakeholder input.

Local plans refer to both plans that are conducted by a single agency for their jurisdiction as well as multi-agency plans that cover larger areas. Jurisdictions of these local plans are relevant to the IRWMP, because local agencies ultimately implement the IRWMP through projects that are also in their local plans. Thus, the management tools and criteria in those local plans are naturally reflected in how this IRWMP is implemented, if not also in its development and update. This project implementation preferably happens in collaboration with other local agencies. Local plan jurisdictions can also help identify opportunities for collaboration with neighboring IRWM regions (explained in **Section 3.4**), when a local agency boundary crosses IRWM region boundaries.

This IRWMP incorporates, and is consistent with, all existing local water planning documents including: Urban Water Management Plans, climate action plans, water master plans, groundwater management plans, recycled water master plans, habitat conservation plans, stormwater management plans, and other water resources plans and studies. These planning documents provide important information on water supply and demands, local water management issues, climate change adaptation and mitigation strategies, and

environmental conditions. Reference to some of these documents can be found throughout **Section 2**. The IRWMP ensures consistency with local planning efforts by having those local agencies directly participate in the IRWMP development and update. As local water planning efforts are undertaken or updated in the future, the RWMG will consider directly incorporating any relevant changes into the IRWMP. As explained in **Section 5.6**, the IRWMP framework strategies are especially meant to be adapted at higher frequencies, and new strategies can be developed in line with changes in local plans. Conversely, local planning should also be consistent with the IRWMP. This coordination relationship is further assured by having the IRWMP Framework (described in **Section 5.1**) as part of the resolution for those organizations that adopt the ARB IRWMP. Collaboration and relationships that have developed and continue to develop through the IRWMP effort are also expected to increase integration and effectiveness among local planning agencies.

A list of local water plans and planning efforts that informed the development of the 2018 ARB IRWMP Update is included in **Appendix F**. This list is by no means exhaustive of every effort and plan completed in the Region; rather, it identifies those entities and endeavors that are, have been, or are expected to become active in regional planning in the coming decade. Since completion of the 2013 ARB IRWMP Update, two noteworthy planning requirements were passed by the California legislature that will be closely coordinated with the ARB IRWMP. These are the Sustainable Groundwater Management Act (SGMA) and the Storm Water Resource Planning Act, which were both signed into law in September 2014. Each act requires a specific type of plan development, a Groundwater Sustainability Plan and a Storm Water Resource Plan. Because of the close relationship of these two types of plans with the ARB IRWMP, each is described below. Finally, RWA engaged in two additional planning efforts beginning in 2015 intended to improve long-term water supply reliability. Each of these, the North American Basin Regional Drought Contingency Plan (NAB RDCP) and the Regional Water Reliability Plan (RWRP), is described below.

3.2.1. Groundwater Sustainability Plans

The intent of SGMA is to ensure sustainable management of the groundwater basins in California. SGMA required, by June 30, 2017, the formation of locally-controlled GSAs in groundwater basins and subbasins (basins) designated as medium or high priority by DWR. GSAs in the Region are described in **Section 2.2.3**. Each GSA is responsible for developing and implementing a groundwater sustainability plan (GSP) or an alternative to a GSP (Alternative). SGMA requires that GSAs establish local threshold values to demonstrate sustainability as measured by six sustainability indicators, including as applicable:

- Groundwater levels
- Groundwater storage

- Seawater intrusion
- Degraded water quality
- Land subsidence
- Surface water depletion

Each of the three groundwater subbasins (see **Figure 2-3**) that are either partially or fully included in the Region are required to be managed under a GSP or Alternative by January 31, 2022. In each subbasin, there may be either a single GSP or multiple, coordinated GSPs covering the subbasin. Upon completion of a GSP, GSAs will have up to 20 years to demonstrate compliance with meeting the sustainability indicators.

Recognizing the importance of groundwater resources to the Region and the close relationship between SGMA and IRWM efforts, stakeholders added a new objective and strategy to the 2018 ARB IRWMP Update that address long-term groundwater sustainability (see **Section 5**). These are:

- **Objective 18:** Manage the Region's groundwater basins sustainably.
- **Strategy WR7:** Develop and adopt groundwater sustainability plans or alternative groundwater sustainability plans by 2022.

As GSPs or Alternatives in the Region are adopted and implemented, the RWMG will consider directly incorporating any relevant changes into the IRWMP. Additionally, the RWMG will work closely with GSAs as GSPs are developed to ensure that implementation projects for groundwater sustainability are included into the ARB IRWMP project database, where applicable.

3.2.2. Storm Water Resource Plans

The intent of the Storm Water Resource Planning Act is to promote the use of stormwater and dry weather runoff as important resources to supplement surface water and groundwater supply. In the Region, there are two adopted SWRPs that have been incorporated into the ARB IRWMP. The first is the ARB SWRP. The ARB SWRP was developed in consultation with the RWMG and has a fully coincident boundary with the ARB IRWMP Region. The ARB SWRP will be implemented in the watersheds that exist in the American River Basin IRWMP region, which include the Lower American Watershed, the Upper Bear Watershed, the North Fork American River Watershed, and the South Fork American River Watershed. A second SWRP has been developed for El Dorado County along the west slope of the Sierra Nevada. The West Slope SWRP contains a portion of the South Fork American Watershed, El Dorado Hills Area, which

is within the ARB IRWMP. The West Slope SWRP provided regular briefings to the ARB IRWMP stakeholder meetings during development of the SWRP.

The agencies overseeing these SWRPs will have extensive opportunities to coordinate with each other to promote stormwater management at a regional scale. Ultimately, the implementation of both SWRPs will develop stormwater and dry weather runoff capture projects that will generate multiple benefits in the Region, including improving water quality, water supply, flood management, the environment, and the community. Due to the integrated nature of the stormwater projects identified in these plans, the RWMG will coordinate with these efforts to ensure that they are included in the ARB IRWMP project database, where applicable. The RWMG will adopt a resolution incorporating these two SWRP efforts upon adoption of the 2018 ARB IRWMP Update.

3.2.3. North American Basin Regional Drought Contingency Plan

The NAB RDCP was a planning effort to evaluate the municipal and industrial water supply vulnerabilities of the water resources for agencies with Reclamation water supplies taken from Folsom Reservoir or the lower American River. The NAB RDCP, published in October 2017, was partially funded through a Drought Contingency Planning Grant awarded through Reclamation. Stakeholders from both the Region and CABY regions participated in the NAB RDCP, including the five partner agencies (Placer County Water Agency (PCWA), City of Folsom, City of Roseville, City of Sacramento, San Juan Water District, and RWA) and 12 additional agencies (California American Water, Carmichael Water District, Citrus Heights Water District, City of Lincoln, Del Paso Manor Water District, Fair Oaks Water District, Golden State Water Company, Natomas Central Mutual Water Company, Orange Vale Water Company, Rio Linda/Elverta Community Services District, Sacramento County Water Agency, Sacramento Suburban Water District). The NAB RDCP focused on identifying: 1) threshold hydrologic conditions that allow for early recognition of drought conditions; 2) near-term responses, such as customer outreach or declared conservation stages, to actively manage available supplies during drought; and 3) long-term mitigation actions, such as access to alternative supply sources, to limit future shortages during drought conditions. A copy of the completed NAB RDCP is available at: http://rwah2o.org/regional-water-reliability-and-drought-contingency-plan/.

3.2.4. Regional Water Reliability Plan

The RWRP, is an ongoing RWA-led planning effort to achieve long-term water supply reliability by investigating and identifying potential coordinated and collaborative actions among the region's water agencies. The RWRP builds off of the NAB RDCP, but covers a larger region by including six additional RWA member agencies (City of West Sacramento, City of Yuba, El Dorado County Water Agency, El

Dorado Irrigation District (EID), Elk Grove Water District, and Rancho Murieta Community Services District). The RWRP also goes beyond the scope of the NAB RDCP by evaluating a broader set of vulnerabilities and mitigation actions beyond drought. For example, the RWRP looked at water quality as a potential vulnerability; mitigation actions for addressing this will be different than those for addressing dry conditions. Additional information on the RWRP is available at: http://rwah2o.org/regional-water-reliability-and-drought-contingency-plan/.

3.3. Relationship with Local Land-Use Planning

Land-use planning is an essential power and responsibility for incorporated cities and counties within the Region that use general plans to achieve community land-planning objectives. Land use planning can often be improved by a careful review of the linkages between land use and development decisions and water supply availability and reliability. State laws passed in 2001 (SB 610/221) ensure the consideration of water supply in land use decision making. The availability of water supplies, protection of water resource features such as streams, wetlands and recharge areas, and policies and regulations about water quality, drainage and flooding all play a role in future development.

Land-use planning information is vital to water planning documents, which inform the IRWMP, as land-use impacts water demands within the Region. Water resource planning efforts in the Region take into consideration land-use plans identified in the General Plans for each city/county. Land use planning documents and General Plans provide a primary basis for developing water supply projections and identifying habitat areas that will need to be protected against impacts associated with urban development. Land-use plans will continue to play an important role in developing projects to meet the objectives of the Region and in adapting to the effects of climate change. ARB IRWMP participants will continue to be involved in their own respective city/county land use planning activities as well as coordinate with other regional planning agencies, such as the Sacramento Area Council of Governments (SACOG) to ensure the sufficiency of regional water supplies to accommodate planned land uses.

SACOG is an association of Sacramento region governments formed from the 6 area counties—El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba—and 22 member cities. SACOG provides transportation planning and funding for the Region, and serves as a forum for the study and resolution of regional issues. In addition to preparing the Region's long-range transportation plan, SACOG approves the distribution of affordable housing in the Region and assists in planning for transit, bicycle networks, clean air and airport land uses. As such, it has been a significant stakeholder in the IRWMP process. Further, since SACOG's directors are chosen from the elected boards of its member governments it even shares some of the same governing bodies as the ARB IRWMP stakeholders.

Many land-use agencies are also active in aspects of water management within their jurisdiction. The following list shows agencies (organized by county) in the Region with land use planning authority and responsibility. An asterisk (*) next to the organization indicates that a representative from a planning or related department participated in at least one workshop during the 2018 ARB IRWMP Update development process. An "R" indicates that the organization is a member of RWA.

- El Dorado County
- Placer County*
  - City of Auburn
  - Town of Loomis
  - City of Rocklin
  - City of Lincoln*[R]
  - City of Roseville*[R]
- Sacramento County
  - City of Sacramento*[R]
  - City of Rancho Cordova
  - City of Folsom[R]
  - City of Citrus Heights
  - City of Elk Grove
  - City of Galt

To help ensure a future proactive relationship between land use planning and water management, the Region's stakeholders developed principles, objectives, and strategies as described in **Section 5** that address land use and water management. A key ARB IRWMP objective developed by stakeholders is to "educate public officials on the need to more effectively integrate water resources planning with land use planning

decisions." Specific strategies developed during the ARB IRWMP update that the RWMG will implement to achieve a stronger relation between land-use and water planning include:

- **Strategy CS3:** Identify natural recharge areas and relay that information to relevant land-use planning agencies by 2022, encouraging the preservation of recharge areas.
- **Strategy CS4**: Promote the use of Low Impact Development methods, where appropriate.
- **Strategy CS5:** Provide annual updates to city and county governments and other local agencies on accomplishments and continued challenges of integrated water management.

As part of the 2018 ARB IRWMP Update process, RWA also communicated with land use planning agencies to collect information on local climate change mitigation and adaptation actions. RWA surveyed local land use and water agencies to identify current and future efforts to reduce greenhouse gas emissions. Eleven agencies responded to the survey. The results of the survey are included in **Appendix C**. RWA also identified and collected local climate action and sustainability plans, or General Plan Updates with sustainability elements, identified in **Appendix C** and **Appendix F**. These plans do not specifically focus on water resources. However, many of the mitigation and adaptation measures align with the measures identified in this IRWMP and support ARB IRWMP goals, objectives, and strategies. For example, element U 2.1.2 in the City of Sacramento's 2035 General Plan Update states that "the City shall maintain a surface water/groundwater conjunctive use program, which uses more surface water when it is available and more groundwater when surface water is limited." This aligns with the adaptation strategies identified in **Section 2.10,** as well as ARB IRWMP strategies WR6 and WR9. **Table C-3** in **Appendix C** identifies water management actions in local climate action and sustainability plans. Collaboration between land use planning and water management agencies will be key to the Region's success in mitigating and adapting to the impacts of climate change.

3.4. Relation to Neighboring Regional Planning Efforts

The Region is one of six IRWM regions in the DWR-designated Sacramento River Funding Area (SRFA), and is adjacent to a total of six IRWM regions. Funding areas determine the total Proposition 1 funding that is available to a group of IRWM regions. Funding area delineations also follow the larger Sacramento River Hydrologic Region boundaries, creating common interests as well as a need for collaboration – this coordination and communication in the SRFA are described first in this section. Subsequently, the Region's relationships with each neighboring region are described, addressing areas of adjacent or overlapping geography and common interests. The southernmost portion of the Region in Sacramento County is also in the San Joaquin River Funding Area, and a small fraction on the east side is within the Mountain Counties

Funding Area. As shown in **Figure 2-8**, the Region lies adjacent to the other IRWM regions shown in **Table 3-1**.

Table 3-1. Neighboring IRWM Regions and Associated Funding Areas

IRWM Region	Proposition 1 Funding Areas
Cosumnes, American, Bear, Yuba IRWM Region	Mountain Counties Funding Area
Westside Sacramento IRWM Region	Sacramento River Funding Area
Northern Sacramento Valley IRWM Region	Sacramento River Funding Area
Yuba County IRWM Region	Sacramento River Funding Area, Mountain Counties Funding Area
Eastern San Joaquin County IRWM Region	San Joaquin River Funding Area
Mokelumne/Amador/Calaveras IRWM Region	San Joaquin River Funding Area, Mountain Counties Funding Area

Key:
IRWM = Integrated Regional Water Management

A small portion of southwestern Sacramento County is not in any IRWM Region, and is described in **Section 3.4.7**.

3.4.1. Sacramento River Funding Area

Proposition 1 IRWM funding for the Region is tied to 12 funding areas throughout the state. The Region straddles the SRFA, San Joaquin River Funding Area, and the Mountain Counties Funding Area. However, the majority of the Region's area and population are in the SRFA. Therefore, the Region has been predominantly active in collaborating with the IRWM efforts in the SRFA region.

The SRFA currently consists of six approved IRWM regions, which were determined through the DWR Region Acceptance Process. Representatives from regions first met in June 2008,[1] to discuss common interests and continue to meet periodically, as needed. Meetings focus on communication and collaboration, and identification of joint projects and several specific objectives that include:

- Ensuring that adjacent or overlapping regions define an appropriate level of coordination.
- Recognizing the need for additional planning, and the need for state funding to support it, in all of the independent regions.
- Exploring the concept of an equitable funding distribution in the SRFA.

The various IRWMs in the region have developed specific agreements or understandings with adjacent regions with which they have a boundary overlap. Over the course of the SRFA meetings, participants have

[1] At the time of this initial meeting, there were 10 regions within SRFA. Since the 2009 Region Acceptance Process, some of the region boundaries have been redrawn.

identified specific planning needs of each IRWM region based on the past, current, and potential future events in the area. This coordination effort is expected to continue into the future.

3.4.2. CABY IRWM Region

When the Region began its IRWMP in 2004, the entire American River watershed was included in the plan boundaries. At that time, the RWA, as the RWMG, looked to the extent of the American and Cosumnes river watersheds as a boundary, which was included in the adopted May 2006 ARB IRWMP. In 2005, an effort began to develop an IRWMP in the upper watersheds of the Cosumnes, American, Bear, and Yuba rivers, known collectively as the CABY IRWMP Region. Later in 2006, both RWA and members of the CABY Region discussed the boundary overlap and agreed that the upper watershed is sufficiently different from the lower watershed to justify the creation of a separate IRWMP for the upper reaches (above the Sacramento Valley floor) of these four river systems. The CABY IRWMP addresses interests in the upper elevation portions of the Cosumnes and American rivers. Both entities agreed that the CABY Region would be appropriate to organize planning efforts in the upper watershed and collaborate with the ARB RWMG on issues of mutual interest. This was first documented in a July 2007 letter to CABY's RWMG, which was included in the CABY Region's 2007 submittal for Proposition 50 implementation grant funding. DWR acknowledged this collaboration when the CABY Region was considered eligible for Proposition 50, Round 2 Funding.

CABY and ARB RWMGs continue to coordinate their efforts. Both organizations have members that attend the others' regular meetings, and PCWA, El Dorado County Water Agency, and EID, in particular, are involved in both IRWMP processes. In addition, the two regional bodies have drafted a Memorandum of Understanding (MOU). This MOU formally presents the cooperation and collaboration between the two RWMGs. It specifies that "In the areas of coordination, the regions may partner to propose studies, projects, programs or other actions that benefit both regions."

The MOU process itself is a good example of the extent of collaboration between the two entities as it involved the governing bodies, staff, and stakeholders of both organizations in the development of both the underlying conceptual agreements as well as the language of the final version.

Stakeholders and areas of focus differ between the ARB and CABY regions. The key priorities in the Region: providing water and wastewater services to primarily a growing urban population; maintaining and enhancing the environment and fisheries of the lower American and Cosumnes rivers; improving stormwater quality, groundwater basin sustainability, and flood protection in an urban area; and expanding recycled water use, do not all coincide directly with objectives in the CABY Region. Even when areas of interest coincide, the specific issues, objectives, and the interested stakeholders often differ. For these

reasons, coordination on the common interests, rather than consolidation into a larger region, continues to be the most effective and efficient approach to IRWM.

Both regions agree with the goal of sound management of the entire American and Cosumnes watersheds for all beneficial uses, so a number of mechanisms have been developed and implemented to ensure coordination. The ARB and CABY regions have small areas of geographic overlap in parts of El Dorado and Placer counties (**Figure 2-8**). These areas are more urbanized than much of the rest of the CABY Region, and thus share common interests with the urban water suppliers in the Region. Additionally, the communities in the overlap area are in close enough proximity to both Folsom Lake and the main groundwater basin to create opportunities for developing conjunctive use projects. Three water agencies participate in both the CABY and ARB IRWMP: EID, El Dorado County Water Agency, and PCWA. This common membership helps to ensure coordination on issues across the regional boundary. As a result of ongoing coordination, the ARB and CABY regions have identified western Placer creeks habitats as a potential of coordination and joint project development. Improvement of the fisheries of the upper reaches of these streams is an objective in the CABY Region. However, removal of barriers on these streams in the Region is critical to success. CABY and ARB stakeholders have met on several occasions to work on identifying issues and potential solutions.

3.4.3. Westside Sacramento IRWM Region

To the west, the Region is bounded by the Westside-Sacramento (Westside-Sac) IRWM Region, which consists of Cache Creek and Putah Creek watersheds. The Westside-Sac Region combined the former Yolo County IRWM Region with the Sacramento River Hydrologic Region portions of Solano County, Lake County, and Napa County as part of the Regional Acceptance Process in 2009. The ARB and Westside-Sac regions have no overlap, but do share the Sacramento River as a common boundary, as a source of water supply, and as a potential source of flooding.

Agency jurisdictions and organization membership across the ARB IRWM region boundaries help ensure coordination with Westside-Sac. The Westside-Sac RWMG includes the Water Resources Association (WRA) of Yolo County. WRA fully incorporates members of the Woodland-Davis Clean Water Agency (WDCWA) Joint Powers authority. The WDCWA along with the City of West Sacramento (West Sacramento), are also full members in the RWA, although they participate in the Westside-Sac IRWMP. The cities of Davis and Woodland have also independently participated in RWA-led water efficiency programs in the past.

The focus of the WDCWA is to implement and oversee a regional surface water supply project. This project replaced deteriorating groundwater supplies with safe, more reliable surface water supplies from the

Sacramento River. The project was completed in 2016 and serves more than two-thirds of the urban population of Yolo County. It also serves the University of California Davis, a project partner. Primary project goals include providing a new water supply to help meet existing and future needs, improving drinking water quality and improving the quality of treated wastewater.

The latter is of particular interest to another ARB stakeholder and RWA member, the Sacramento Regional County Sanitation District (SRCSD). SRCSD has served West Sacramento since 2008, and its board of directors represents West Sacramento and Yolo County in addition to the Sacramento region incorporated cities. SRCSD discharges to the Sacramento River and this activity is increasingly regulated. Improvements in the quality of treated wastewater and improving wastewater options will benefit, on many levels, both the ARB and Westside-Sac Region, as well as downstream users.

Flood management is a common issue on both sides of the Sacramento River. Both the ARB and Westside-Sac regions are a part of the Lower Sacramento/Delta North Region Regional Flood Management Plan process led by West Sacramento Area Flood Control Agency (WSAFCA). This effort, started in February 2013, is part of an overall approach to implementing the state's 2017 Central Valley Flood Protection Plan (CVFPP). DWR provided local funding and support for development of Regional Flood Management Plans (RFMP). The 2014 RFMP identified a list of priority regional flood projects, which were considered in the Sacramento River Basin-Wide Feasibility Study led by DWR, as well as the ARB and Westside-Sac region planning processes. In addition, in March 2013, DWR initiated a public engagement process for the CVFPP Basin-Wide Feasibility Study and Conservation Strategy. A draft of the CVFPP Basin-Wide Feasibility Study was released in 2017, whereas the CVFPP Conservation Strategy was adopted in 2017 with the latest updates. WSAFCA, and its counterpart, Sacramento Area Flood Control Agency (SAFCA), and other flood-related agencies have been closely coordinating through these and other flood planning efforts.

While collaboration is sought, the ARB and the Westside-Sac regions may have different goals for flood management efforts. Discussion regarding changes to agricultural lands has created some tension in the Westside-Sac Region. One source of this tension is that the Yolo Bypass expansion could affect some agricultural land in Yolo County. Higher water stages in the Yolo Bypass could also potentially increase flood risk in land adjoining the bypass. For the Region, however, an expansion of the Yolo Bypass creates benefits by allowing for efficient conveyance of flood waters from Sacramento's urban areas.

Other multi-regional efforts have occurred in past years with the completion of numerous Sacramento River Basin watershed assessments and watershed management plans. Both ARB and Westside-Sac regions are incorporating watershed projects into their plans, particularly those with the ability to affect conditions on

the ground (i.e., implement actions to protect or improve watershed resources and overall watershed conditions). Watershed improvement work is being done by locally-directed management groups; by local, state, and federal agencies; and by other public and private entities. Planned projects are intended to benefit water quality, stream flow and aquatic habitat, fish passage, fire and fuels management, habitat for wildlife and waterfowl, eradication of invasive plant species, flood management, and watershed stewardship education. Support for this work has come from a broad spectrum of public and private sources.

In addition to projects and institutional arrangements, Westside-Sac and the Region jointly share stakeholders from the environmental, agricultural and business sectors as well as DAC representatives. Groups like The Nature Conservancy have provided leadership, as have representatives involved with resource conservation districts and farm bureaus.

3.4.4. Northern Sacramento Valley IRWM Region

The relationship of the Northern Sacramento Valley (NSV) and ARB IRWM regions is primarily the Sacramento River and the downstream portions of the Upper Bear and Upper Coon-Upper Auburn watersheds. The NSV Region boundary is adjacent to Placer and Sacramento counties in the Region (**Figure 2-8**). Several local ARB agencies have jurisdictions that include the area east of the Feather River and south of the Bear River, which is in the NSV Region. A few of these common agencies with direct relationships to both plans are Natomas Central Mutual Water Company (NCMWC), South Sutter Water District, SAFCA, and Reclamation District 1000.

NCMWC, being an agricultural water supplier and a Sacramento River diverter, shares a host of common interests with the partners in the Sacramento Valley IRWM Region. However, NCMWC is a member of the SGA, for its service area in Sacramento County, and landowners within its boundary share an interest in a common groundwater subbasin.

South Sutter Water District overlies much of Sutter County and a small portion of western Placer County. South Sutter Water District is an agricultural supplier, and is served by the Bear River (rather than the American), so it has limited common interests with the Region. However, the district has participated in stakeholder meetings during development of the ARB IRWMP and part of its service area overlies Placer County within the Region.

SAFCA and Reclamation District 1000 are flood agencies, and their jurisdictions span north of the Region to the Cross Canal, which is a part of the NSV Region. Flood concerns in this area would be affected by the NSV IRWMP.

The NSV and Regions also share the North American groundwater subbasin. The Region, through the SGA, has actively coordinated with the portion of western Placer County not in the ARB and eastern Sutter County on management of groundwater. This coordination has increased significantly as a result of SGMA, which is described above.

3.4.5. Yuba County IRWM Region

The Yuba County IRWM Region bounds the Region to the north. Region staff have met with Yuba County Water Agency staff and agreed that the boundary represents a natural division on which to base planning regions. The Yuba County IRWM area is generally served by water supplies from the Bear and Yuba rivers, as opposed to the American River, which serves much of the Region. Likewise, flood control concerns for the urban areas in the regions are focused on the different river systems. Staff of the two regions continue to meet, as a part of broader funding area meetings, and identify mutual interests as they arise.

3.4.6. Eastern San Joaquin County IRWM Region

On the south, the Region is bounded by the Eastern San Joaquin County IRWM Region. The planning effort for that IRWMP was led by the Northeastern San Joaquin County Groundwater Banking Authority (GBA) in collaboration with multiple stakeholders, including some Region participants. Although the boundary between the two regions is set at the county line, it also represents a distinct division between two watersheds—the Upper Cosumnes and the Upper Mokelumne (see **Figure 2-2**).

The area of focus has been the Cosumnes groundwater subbasin, which spans both Sacramento and San Joaquin counties, and is a part of the larger San Joaquin Valley Basin. There has been significant information sharing and coordination with the Region's South Area Water Council (SAWC) on project development and groundwater modeling activities of the GBA. In this process GBA learned "the fate of the groundwater basin is linked not to a political jurisdictional boundary between Sacramento and San Joaquin County, but is linked through a hydrologic boundary that is impacted by the activities of water resource management in each area."

Groundwater modeling completed during the planning process illustrates the nature of this hydrologic linkage in that future no action scenarios predict the joining of over-drafted groundwater depressions in both south Sacramento County and northern San Joaquin County into a larger groundwater depression.

The GBA has been included as stakeholders in the SAWC effort and participated in the development of an MOU for groundwater management by the six sponsoring agencies including:

- SSCAWA

- City of Galt
- Rancho Murieta Community Services District
- The Nature Conservancy
- Sacramento County Water Agency (SCWA)
- DWR—Conjunctive Management Program

In particular, the MOU specifically recognizes the importance of better coordination with water management efforts in adjacent areas including San Joaquin County. The MOU will ensure appropriate communication and possible opportunities for collaboration on projects in the future.

Outside of the direct agreements related to groundwater, the interests of the Eastern San Joaquin Region, including mitigation of severe overdraft, saline water intrusion into the groundwater basin, and a myriad of issues reflecting their location in the Sacramento-San Joaquin River Delta (Delta), differ markedly from the Region.

3.4.7. Mokelumne/Amador/Calaveras IRWM Region

The Region shares the southeastern border with the Mokelumne/Amador/Calaveras (MAC) Region. The MAC Region encompasses the upper portions of Cosumnes, Mokelumne, and Calaveras river watersheds, extending east into the Sierra Nevada. A small portion of the South Fork American River is also a part of the MAC Region.

The Region shares the Cosumnes and Mokelumne watersheds with the MAC Region, and the MAC Region stakeholder's management of these rivers inherently affects the downstream areas. However, these rivers cover a less developed area of either forest or private agricultural land, and integrated management of resources within these areas is still under development.

The MAC Region overlies and heavily relies on the Cosumnes groundwater subbasin, which is also an important resource for the southern Region. The SAWC developed a GMP in 2011 to manage the portion of the subbasin in the Region. Coordination and outreach to users within the MAC Region on matters of mutual concern are ongoing.

3.4.8. Southwestern Sacramento County

The only area adjacent to the Region that is not included in an IRWM region is the southwestern "panhandle" of Sacramento County. This area is distinctly different from the Region in a number of

respects. First and foremost, it is located in the primary zone of the Delta; therefore, planning will be much more closely aligned with implementation of the 2008 Delta Vision Strategic Plan and the Delta Reform Act. This area is outside the American and Cosumnes river watersheds and does not rely on those watershed's resources, which are the primary distinguishing characteristics defining the Region. The area has no water infrastructure interconnections with the rest of the Region. Finally, this area was specifically excluded from the Water Forum process, so it has not been part of the regional planning that has been the focus of implementing the WFA.

3.5. Coordination with State and Federal Planning Efforts

The ARB RWMG and staff coordinates with state and federal efforts on behalf of the Region. Local agencies and entities also coordinate efforts directly with various state and federal agencies individually. **Section 3.5.1** below describes coordination with state efforts, while **Section 3.5.2** describes the relationship with federal efforts.

3.5.1. State Coordination

As entities with legal and formal water management authority, water management agencies throughout the Region coordinate with and formally report to a variety of agencies representing the state. The agencies, their primary role, and the circumstances where ARB water management agencies coordinate with them are listed in **Table 3-2**.

Table 3-2. State Agency Roles and Interactions with the Region

State Agency	Interaction with ARB stakeholders
California Department of Fish and Wildlife	Collaboration on habitat and fisheries Streambed alteration permitting
California Department of Parks and Recreation	Land management within the Region Inclusion of recreational concerns in the planning process
State Water Resources Control Board, Division of Drinking Water	Issuing/updating drinking water operating permits Recycled water (Title 22) permits
California Department of Transportation	Land use and transportation issues Stormwater runoff and water quality Infrastructure associated with levees and waterway crossings
California Department of Water Resources	Preparing California Water Plan IRWM planning and funding program Local assistance program Flood management Statewide water policy Approving groundwater sustainability plans
California Public Utilities Commission	Regulation of investor owned utilities
Water Boards (State Water Resources Control Board and Central Valley Regional Water Quality Control Boards)	Water rights administration Wetlands permitting NPDES permitting, both point and nonpoint source Approving storm water resource plans Local assistance program & State Revolving Fund Other water quality issues

Key:
ARB = American River Basin
IRWM = Integrated Regional Water Management
NPDES = National Pollutant Discharge Elimination System

While several ARB water management agencies have formal and legal relationships with state agencies, it is important to note that cooperative relationships have developed over the years for mutual benefit. For instance, members of the RWA were signatory to the first conjunctive use MOU with DWR in the early days of integrated regional water management. This partnership and mutual exploration played a role in informing today's Integrated Water Management Planning Program statewide. Accordingly, this spirit of cooperation has carried forward in the preparation of numerous groundwater management plans and other technical studies within the Region. As partners, DWR and the Water Boards have always been invited to IRWM meetings for their support, input, and guidance.

The Region has greatly benefited from its long standing partnership with state agencies in implementing various projects, most recently through grants from Propositions 84 and 1. As noted in the financing

sections (**Sections 6.1** and **6.2**), state funding for projects has been crucial for the Region, and the Region fully intends to continue its partnerships in the years to come.

3.5.2. Federal Coordination

The Region is similarly subject to federal regulations and coordinates with federal agencies. Some of these interactions are through requirements, such as compliance to drinking water standards, while others are more collaborative in nature, such as jointly developing flood management structures with U.S. Army Corps of Engineers. **Table 3-3** below briefly describes some of these interactions with federal agencies.

Table 3-3. Federal Agency Roles and Interactions with the Region

Federal Agency	Interaction with ARB stakeholders
National Marine Fisheries Service	Fisheries research and management
U.S. Fish and Wildlife Service	Permitting Management of sensitive and invasive species Ecosystem and habitat protection and improvement
U.S. Bureau of Land Management	Management of conservation lands, including the Cosumnes River Preserve Recreation and public access
U.S. Bureau of Reclamation	Water supply/reliability (CVP water) Flood control (through CVP facilities) WaterSMART funding programs
U.S. Environmental Protection Agency	Drinking water standards and requirements Water quality/pollution standards and requirements
U.S. Army Corps of Engineers	Flood management Wetlands/ecosystem permitting Recreation and public access

Key:
ARB = American River Basin
CVP = Central Valley Project

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Section 4
IRWMP Governance

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Abbreviations and Acronyms

ARB	American River Basin
CWC	California Water Code
DWR	California Department of Water Resources
IRWMP	Integrated Regional Water Management Plan
RWA	Regional Water Authority
RWMG	Regional Water Management Group
WFA	Water Forum Agreement

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4. IRWMP GOVERNANCE

This section describes the governance structure for the development and continuing implementation of the American River Basin (ARB) Integrated Regional Water Management Plan (IRWMP) Update. While an outline of a governance structure was proposed in 2009 during California Department of Water Resources' (DWR) Region Acceptance Process, the governance structure and processes evolved throughout IRWMP development and implementation over several years into what is described in this section. This section begins with a brief background as to why the Regional Water Authority (RWA) is suited to serve as the Regional Water Management Group (RWMG) for the ARB Region, proceeds to describe the components of the governance structure, and concludes with an explanation of IRWMP adoption procedures.

4.1. Background

As described earlier in the plan, the historic Water Forum Agreement (WFA) of April 2000 is one of the most notable comprehensive integrated water management plans of its time. In contemplating how to implement the complex elements of the WFA, water agencies in the region chose to create the RWA in July 2001. Given the relationship of RWA in assisting with implementing elements of the WFA, RWA was well-positioned to assume the role of leading development of an IRWMP.

Today, the RWA and its members are successfully implementing conjunctive use programs and an award-winning regional water efficiency program in support of the WFA. Since its inception, RWA's geographic breadth and scope of involvement in regional water issues has grown beyond WFA support. This has made RWA the ideal organization to serve as the RWMG for the ARB. Since the adoption of the 2006 and 2013 ARB IRWMPs, many additional stakeholder groups with varied interests have become engaged in the effort. This increased engagement led RWA to adopt a revised Governance Structure for developing and maintaining the 2018 ARB IRWMP Update.

> RWA is a local public agency formed under the Joint Exercise of Powers Act, California Government Code Sections 6500 et seq. A Joint Powers Authority, RWA is a forum to address regional water issues. As a Joint Powers Authority, RWA has the ability to "exercise jointly the common powers of its Members in studying, planning and implementing ways and means to provide reasonable and financially-feasible projects, programs and cooperative operations activities for Members" and may "…exercise any powers in the manner and according to methods provided under the laws applicable to a Community Services District…"

4.2. ARB IRWMP Governance Structure

The Governance Structure is intended to encourage broad stakeholder involvement while providing a stable organization for the ongoing development, implementation, and maintenance of the ARB IRWMP based on RWA's demonstrated stability and accomplishments since its formation. The Governance Structure adopted in 2009 was used throughout the 2013 ARB IRWMP update effort, with the exception of the addition of the Planning Forum.

The Governance Structure for the 2013 ARB IRWMP Update consisted of four primary components:

- Planning Forum[1]
- Advisory Committee
- Management Committee
- RWMG—RWA

The purpose of the Management Committee was to oversee management of the process and logistics of 2013 ARB IRWMP Update development and implementation, including collecting and managing funds for development of the IRWMP. During development of the 2013 ARB IRWMP Update, the Management Committee recognized that its function would no longer be necessary once the update was completed. The Management Committee recommended that it would "sunset" as a group and have future maintenance and implementation of the IRWMP be the responsibility of RWA as the RWMG. RWA approved this action and has assumed responsibility for IRWMP maintenance and implementation from the Management Committee.

The Governance Structure for the 2018 ARB IRWMP Update is shown in **Figure 4-1**. The Planning Forum serves as the foundation for establishing and revising the ARB IRWMP Framework (described in **Section 5**). The Advisory Committee considers input from the Planning Forum, reviews projects subsequent to IRWMP adoption, and reviews and recommends priority projects to be included in the future IRWM implementation grant solicitations. RWA ultimately has responsibility of adopting and maintaining the ARB IRWMP. Members and staff of the RWA are present at all governance levels, ensuring communication. All components of the Governance Structure are described further below.

[1] As adopted in 2009, the revised Governance Structure included both a Planning Forum and a Stakeholder Forum. In 2011, these two forums merged into the Planning Forum (see Section 4.2.1).

Table 4-1 (included at the end of this section) shows participants in the Governance Structure, including level of involvement, any specific water management authority,[2] and types of agencies and stakeholders (relative to those groups identified in California Water Code (CWC) Section 10541(g) (4)-(13)). Likely potential future participants are also included in the table. These are entities with statutory authority over water or water management of which RWA is aware and has, in most cases, coordinated with in the past. Discussion of overall stakeholder involvement is included in **Section 3.1**.

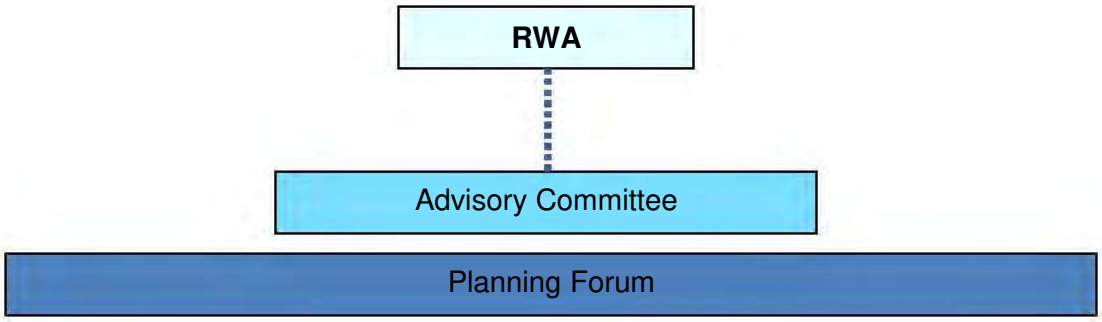

Figure 4-1. ARB IRWMP Governance Structure

4.2.1. Planning Forum

The 2013 ARB IRWMP Update governance structure included both a Planning Forum and a Stakeholder Forum. The concept at the time was that the Stakeholder Forum would provide an open, accessible, and ongoing environment for allowing stakeholders to voice concerns, make suggestions, or simply stay informed. The goal of the Stakeholder Forum was to provide stakeholders with the information needed to become as engaged as they felt necessary, and to promote access to the other levels of the Governance Structure. Stakeholders were continuously identified through participation in other regional planning efforts (past and present) as well as public notifications, members of community and professional groups, Web sites, and other outreach methods.

Based on the participation at the initial Stakeholder and Planning forums, RWA found that the majority of stakeholders were interested in participating at both levels. As a result, the two forums were consolidated into one Planning Forum beginning in September 2010. This consolidated forum serves the purposes of both forums–development and review of the ARB IRWMP, as well as information exchange and feedback.

[2] It is not a requirement to have specific statutory water management authority to be a participant in the Planning Forum.

The Planning Forum allows participants to:

- Provide input to the ARB IRWMP development, especially on defining and revising the plan Framework (vision, principles, goals, objectives, strategies, and project prioritization methodology)
- Serve as a technical forum for data sharing
- Provide for collaboration opportunities among project proponents, leading to more integrated, multi-benefit projects
- Assess or develop project concepts to meet regional objectives
- Ensure that project proponents develop necessary project information for inclusion in the ARB IRWMP
- Explore and discuss funding sources for the ARB IRWMP and its implementation

Participants in the Planning Forum are self-selected from the ARB IRWM stakeholder organizations. All Planning Forum workshops are also open to the public to attend and provide comment. The 2018 ARB IRWMP Update was developed with stakeholder input provided at four Planning Forum workshops with over 30 distinct participating entities.

4.2.2. Advisory Committee

During development of the 2013 ARB IRWMP Update, an Advisory Committee was created. The Advisory Committee served a number of functions in the 2013 ARB IRWMP Update development, most of which related to ensuring that input from the Planning Forum was reflected in the ARB IRWMP, and that objective criteria were used to evaluate projects. The Advisory Committee was responsible for:

- Ensuring that broad stakeholder input to the ARB IRWMP was solicited through the Planning Forum
- Reviewing the development of the project prioritization process
- Reviewing projects to evaluate the extent to which they may contribute to the goals and objectives of the ARB IRWMP; which is the initial step in project prioritization
- Reviewing the draft IRWMP to ensure it reflects a broad water resources perspective

- Validating the integrity of the IRWMP development process
- Providing recommendations to the Management Committee and RWMG

The Advisory Committee was designed to be broadly representative, but to be small enough to effectively make decisions. The Advisory Committee consisted of five individuals with broad knowledge of issues of the Region, and represented more than a single entity or project proponent. Makeup of the Advisory Committee included:

- A representative identified by each of the three counties included in the ARB IRWMP, chosen to represent broad public interests (Sacramento, Placer, and El Dorado counties)
- The Executive Director of the Water Forum (having a broad knowledge of water supply, environmental, industry, and public interests in the Region)
- A representative of the California DWR serving as an *ex officio* (nonvoting) member[3] of the committee

During development of the 2013 ARB IRWMP Update, the Advisory Committee met five times. Additional input from the Advisory Committee was solicited electronically, when a limited issue that would not require a meeting came up. While there was no established term limit for the Advisory Committee, members of the Advisory Committee were queried on at least a triennial basis to determine their interest and ability to continue to serve on the committee. If an Advisory Committee member was no longer able to serve, the RWMG would solicit suggestions for a replacement from the group that is represented by the outgoing member on the committee.

Following adoption of the 2013 IRWMP Update, the DWR representative requested to no longer serve on the Advisory Committee. The intent was to have the remaining Advisory Committee members would continue to meet on an as-needed basis to:

- Provide a venue for all stakeholders to raise issues related to the IRWMP
- Review projects submitted subsequent to IRWMP adoption and provide recommendations on their inclusion in the IRWMP project database

[3] The *ex officio* capacity was requested by DWR.

Shortly after adoption of the 2013 ARB IRWMP Update, two members of the Advisory Committee were no longer able to serve on the Committee. Those positions were not refilled, and the Advisory Committee was not called upon relative to any issues related to the IRWMP. During the 2018 ARB IRWMP Update, RWA staff asked the Planning Forum if they still had a preference to maintain an Advisory Committee. The Planning Forum felt that it would be good to reestablish and maintain the Advisory Committee. Based on Planning Forum input, the 2018 ARB IRWMP Update Advisory Committee's continuing role is to:

- Provide a venue for all stakeholders to raise issues related to the IRWMP
- Review projects submitted subsequent to IRWMP adoption and their prioritization, if ranked, and provide recommendations on their inclusion in the IRWMP project database
- Review and recommend priority projects to be included in future IRWM implementation grant solicitations submitted through the RWMG

While they are chosen to reflect broad interests, Advisory Committee members may find that they have a conflict of interest on specific issues or decisions. Members will self-identify these situations and recuse themselves from such matters.

4.2.3. Regional Water Management Group – Regional Water Authority

Building on a long history of successful regional planning and implementation, RWA serves as the formal governing body for developing, maintaining, implementing, and updating the ARB IRWMP.

RWA includes 21 members and 5 associate members involved in water management, wastewater management, stormwater management, land-use oversight, municipal government, and habitat management. Most RWA member organizations are represented on the RWA Board by elected members of their individual boards of directors or councils, making them accountable to the public at large. Associate members are private or public entities that are not water utilities in the

RWA's Mission

To serve and represent regional water supply interests, and to assist RWA members in protecting and enhancing the reliability, availability, affordability and quality of water resources.

Region, but have an interest in regional water matters. Associate members do not hold a voting seat on the RWA Board, but participate in policy discussions, programs, and partnerships. RWA members and associates include:[4]

- California American Water
- Carmichael Water District
- Citrus Heights Water District
- City of Folsom
- City of Lincoln
- City of Roseville
- City of Sacramento
- City of West Sacramento
- City of Yuba City
- County of Placer (Associate)
- Del Paso Manor Water District
- El Dorado County Water Agency (Associate)
- El Dorado Irrigation District
- Elk Grove Water District
- Fair Oaks Water District
- Golden State Water Company
- Orange Vale Water Company
- Placer County Water Agency

[4] The City of West Sacramento and City of Yuba City are members of the RWA, but not the ARB IRWMP.

- Rancho Murieta Community Services District
- Rio Linda/Elverta Community Water District
- Sacramento Area Flood Control Agency (Associate)
- Sacramento County Water Agency
- Sacramento Municipal Utility District (Associate)
- Sacramento Regional County Sanitation District (Associate)
- Sacramento Suburban Water District
- San Juan Water District

With its long history of participating in and leading integrated regional planning and implementation efforts in the Region, RWA is a stable, ongoing institution, well suited to the long-term task of IRWMP development, maintenance, and implementation. The board meets on the second Thursday of every other month, which will help ensure ongoing opportunities to keep the IRWMP at the forefront of regional planning. These meetings are noticed and open to the public.

In addition, the close relationship between RWA and the Water Forum Successor Effort provides an additional avenue for stakeholder involvement through working relationships developed over more than a decade. WFA signatories are identified in **Table 4-1**.

Roles of the RWA as the RWMG include:

- Considering the input of stakeholders and the recommendations of the Advisory Committee to make final decisions on the content of the ARB IRWMP
- Adopting the ARB IRWMP on behalf of the Region
- Employing the staff and consultants for development and implementation of the ARB IRWMP

Decisions are vetted within the RWMG and made at board meetings. RWA staff will perform the following duties during implementation of the IRWMP:

- Coordinate and provide leadership for the meetings of the Advisory Committee and the Planning Forum
- Meet independently with project proponents and stakeholder groups at their request
- Coordinate with neighboring IRWM groups
- Document any changes to the ARB IRWMP
- Update the project database and ensure new or modified projects are vetted with stakeholders
- Monitor funding opportunities
- Communicate funding opportunity information to appropriate project proponents
- Track progress of implementation of projects in the ARB IRWMP
- Periodically communicate the status of ARB IRWMP implementation

RWA's Foundational Goals

RWA adopted four Foundational Goals in July 2009 to implement its mission. The Foundational Goals represent its desire to consistently make progress in priority areas of activity that will serve the needs of members. Both current and future objectives and actions of RWA will be consistent with pursuing these goals.

Goal 1 – Continuously improve an integrated regional water management plan that is comprehensive in scope and guides effective water resources management in the region.

Goal 2 - Assist members with implementing successful water resources management strategies and related programs. This includes identifying, acquiring and administering external sources of funding.

Goal 3 – Inform and educate members and interested parties by providing a forum for discussion of issues, outreach to stakeholders, and a clearinghouse for sharing information.

Goal 4 – Represent regional needs and concerns to positively influence legislative and regulatory policies and actions.

Because the RWMG is an existing joint powers authority, it is not anticipated that Native American Tribes or other non-member groups will be represented directly on the RWMG. The RWMG is directly accessible through public meetings and through RWA staff, and all groups are encouraged to participate in the Planning Forum. As described in **Section 3.1.5**, there is an ongoing effort through the Disadvantaged Community Involvement Program for tribal engagement. The RWMG will consider recommendations from that effort when it is concluded. The RWMG recognizes that Native American Tribes are sovereign nations, and as such coordination should be on a government-to-government basis.

4.3. ARB IRWMP Adoption

As the RWMG, RWA is the primary adopting body of the 2018 ARB IRWMP Update. The RWA resolution adopting this 2018 ARB IRWMP Update on July 12, 2018, is included as **Appendix A**. An intention to adopt this IRWMP was published in accordance with Section 6066 of the Government Code, and the IRWMP was adopted in a public meeting of the RWA governing board.

Adoption by stakeholders is not a requirement for participation or for proposing a project for inclusion in the ARB IRWMP. However, consistent with DWR's 2016 IRWM Grant Program Guidelines, "proponents of projects included in an IRWM Implementation proposal must adopt the IRWM Plan," and RWA anticipates that any such project proponents will pass a "Resolution of Adoption" (see **Appendix A** for a draft resolution, approved by DWR). A list of all organizations that have adopted the 2018 ARB IRWMP Update will be maintained on the RWA Web site.[5] Stakeholders and project proponents may adopt the IRWMP on a quarterly basis as the IRWMP is implemented into the future.

[5] http://rwah2o.org/programs/integrated-regional-water-management/

Table 4-1. Current and Potential Future Participants in ARB IRWMP Governance Structure

#	Agency	Statutory Authority over Water or Water Management in ARB Region[a]	Governance Structure Participation				Other Types of Agencies and Stakeholders[c]								
			RWA	Advisory Committee	Planning Forum[b]	Municipal/County Gov't or Special District	Electric Corporation	Native American Tribe	Self-Supplied Water User	Environmental Stewardship Organization	Community Organization	Industry Organization	State, Federal, or Regional Agency or Univ.	Disadvantaged Community Members or Rep.s	Other Interested Group
1	Aerojet				X										X
2	California American Water*	X	X												
3	California Association of Resource Conservation Districts				X	X				X	X				
4	California Department of Water Resources	X			X								X		
5	California Office of Environmental Health Hazard Assessment				X								X		
6	California State University Sacramento – Office of Water Programs														X
7	Carmichael Water District*	X	X		X										
8	Central Valley Regional Water Quality Control Board	X			X								X		
9	Citrus Heights Water District*	X	X		X										
10	City of Elk Grove				X	X									
11	City of Folsom*	X	X		X										
12	City of Lincoln	X	X		X										
13	City of Rancho Cordova				X	X									
14	City of Rocklin				X	X									
15	City of Roseville*	X	X		X		X								
16	City of Roseville Stormwater Program	X			X										
17	City of Sacramento*	X	X		X										
18	Cosumnes Coalition				X										X
19	Del Paso Manor Water District*	X	X		X										
20	Dry Creek Conservancy				X					X	X				
21	Ducks Unlimited				X					X					
22	El Dorado County			X	X										X
23	El Dorado County Water Agency*	X	X	X											
24	El Dorado Irrigation District*	X	X		X										
25	Elk Grove Stormwater Program	X			X										
26	Elk Grove Water District	X			X										
27	Environmental Justice Coalition for Water				X						X			X	
28	Fair Oaks Water District*	X	X												

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Table 4-1. Current and Potential Future Participants in ARB IRWMP Governance Structure (contd.)

#	Agency	Statutory Authority over Water or Water Management in ARB Region[a]	Governance Structure Participation				Other Types of Agencies and Stakeholders[c]								
			RWA	Advisory Committee	Planning Forum[b]	Municipal/County Gov't or Special District	Electric Corporation	Native American Tribe	Self-Supplied Water User	Environmental Stewardship Organization	Community Organization	Industry Organization	State, Federal, or Regional Agency or Univ.	Disadvantaged Community Members or Rep.s	Other Interested Group
29	Freeport Regional Water Authority	X			X										
30	Golden State Water Company*	X	X												
31	HDR														X
32	Laguna Creek Watershed Council				X					X	X				
33	League of Women Voters*				X						X				
34	Mission Oaks Recreation and Park District				X	X			X		X				
35	Natomas Central Mutual Water Company*	X			X										
36	Omochumne-Hartnell 52Water District*	X			X										
37	Orange Vale Water Company*	X	X												
38	Placer County – Planning Department			X	X	X									
39	Placer County – Stormwater/Flood Management	X			X										
40	Placer County Flood Control & Water Conservation District	X			X										
41	Placer County Resource Conservation District				X	X				X	X				
42	Placer County Water Agency*	X	X		X										
43	Rancho Murieta Community Services District*	X	X		X										
44	Rio Linda/Elverta Community Water District*	X	X		X										
45	Sacramento Area Council of Governments				X						X				
46	Sacramento Area Creeks Council				X					X	X				
47	Sacramento Area Flood Control Agency	X			X										
48	Sacramento Central Groundwater Authority	X			X										
49	Sacramento County/Sacramento County Water Agency*	X	X	X	X										
50	Sacramento County Environmental Management Department	X			X										
51	Sacramento County Stormwater Program	X			X										
52	Sacramento Groundwater Authority	X			X										
53	Sacramento Municipal Utility District*	X	X				X								
54	Sacramento Regional County Sanitation District	X	X		X										

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Table 4-1. Current and Potential Future Participants in ARB IRWMP Governance Structure (contd.)

#	Agency	Statutory Authority over Water or Water Management in ARB Region[a]	Governance Structure Participation				Other Types of Agencies and Stakeholders[c]								
			RWA	Advisory Committee	Planning Forum[b]	Municipal/County Gov't or Special District	Electric Corporation	Native American Tribe	Self-Supplied Water User	Environmental Stewardship Organization	Community Organization	Industry Organization	State, Federal, or Regional Agency or Univ.	Disadvantaged Community Members or Rep.s	Other Interested Group
55	Sacramento Suburban Water District*	X	X		X										
56	San Juan Water District*	X	X		X										
57	Save Auburn Ravine Salmon and Steelhead				X					X	X				
58	Save the American River Association*				X					X	X				
59	Sierra Club*				X					X	X				
60	Sloughhouse Resource Conservation District				X	X				X	X				
61	South Area Water Council	X			X										
62	South Sutter Water District	X			X										
63	Southeast Sacramento County Agricultural Water Authority	X			X				X						
64	The Nature Conservancy				X					X	X				
65	U.S. Department of the Interior, Bureau of Reclamation	X			X								X		
66	Valley Foothills Watersheds Coalition				X					X	X				
67	Water Forum/Water Forum Successor Effort			X	X										X
68	Wilton Action Group				X						X				
69	Woodard & Curran														X
70	American River Flood Control District	X													
71	City of Galt*	X													
72	Clay Water District*	X													
73	Florin County Water District*	X													
74	Reclamation District 1000	X													
75	Sacramento County Farm Bureau*	X										X			
76	Tokay Park Water District	X													
77	United Auburn Indian Community of the Auburn Rancheria							X							
78	U.S. Army Corps of Engineers	X											X		
79	Wilton Rancheria							X							

Notes:
* Signatory of the Water Forum Agreement.
[a] Water supply (surface water, groundwater, recycled water, reclaimed water), water quality management, wastewater collection, wastewater treatment, flood management, stormwater management, etc. Per Sacramento County LAFCo (http://www.saclafco.org/ServiceProviders/default.htm), Placer County LAFCo (http://www.placer.ca.gov/departments/lafco/special%20agency%20contacts), and El Dorado County LAFCo (http://www.edlafco.us/Directory.html).
[b] Consolidated Stakeholder and Planning forums.
[c] Identified in California Water Code section 10541(g)(4)-(13).
Key:
ARB = American River Basin
LAFCo = Local Agency Formation Commission
RWA = Regional Water Authority

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Section 5
IRWMP Framework

Sacramento River Hydrologic Region

Sacramento ARB Region

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Abbreviations and Acronyms

AB	Assembly Bill
AFB	Air Force Base
ARB	American River Basin
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins
CARB	California Air Resources Board
CSSIP	Combined Sewer System Improvement Plan
CVFPP	Central Valley Flood Protection Plan
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWA	Clean Water Act
CWP	California Water Plan
Delta	Sacramento-San Joaquin River Delta
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
Framework	ARB IRWMP Framework
GSA	groundwater sustainability agency
GSP	Groundwater Sustainability Plan
IRWM	integrated regional water management
IRWMP	Integrated Regional Water Management Plan
LID	low impact development
MGD	million gallons per day
NAB RDCP	North American Basin Regional Drought Contingency Plan
NPDES	National Pollutant Discharge Elimination System
RFMP	Regional Flood Management Plan
RMS	resource management strategy
RWA	Regional Water Authority
RWRP	Regional Water Reliability Plan
SAFCA	Sacramento Area Flood Control Agency
SB	Senate Bill
SCGA	Sacramento Central Groundwater Authority
SEA/EIR	Supplemental Environmental Assessment/Environmental Impact Report
SFPC	State Plan of Flood Control
SGA	Sacramento Groundwater Authority
SGMA	Sustainable Groundwater Management Act
SNMP	Salt and Nutrient Management Plan
SPFC Planning Area	areas currently protected by facilities of the SPFC
SPFC	State Plan of Flood Control
SRCSD	Sacramento Regional County Sanitation District
SSHCP	South Sacramento Habitat Conservation Plan
SWRP	Storm Water Resource Plan
TAF	thousand acre-feet
TMDL	total maximum daily load
USACE	U.S. Army Corps of Engineers
WDR	Waste Discharge Requirement
WEP	Water Use Efficiency Program

WFA	Water Forum Agreement
WWTP	wastewater treatment plant

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5. IRWMP FRAMEWORK

As described in **Section 3**, this 2018 American River Basin (ARB) Integrated Regional Water Management Plan (IRWMP) Update was developed with extensive stakeholder input. Stakeholders were instrumental in identifying issues that eventually led to what the ARB Region (Region) refers to as its ARB IRWMP Framework (Framework). This section describes in more detail this resultant Framework, the core of the ARB IRWMP.

5.1. Framework Overview

A graphic depiction of the Framework is shown in **Figure 5-1**. Stakeholders were guided in the integrated planning process from higher levels (principles and vision), through strategic considerations (goals and objectives) to increasingly detailed tactical measures (strategies and projects). Elements in the Framework are further defined and described below.

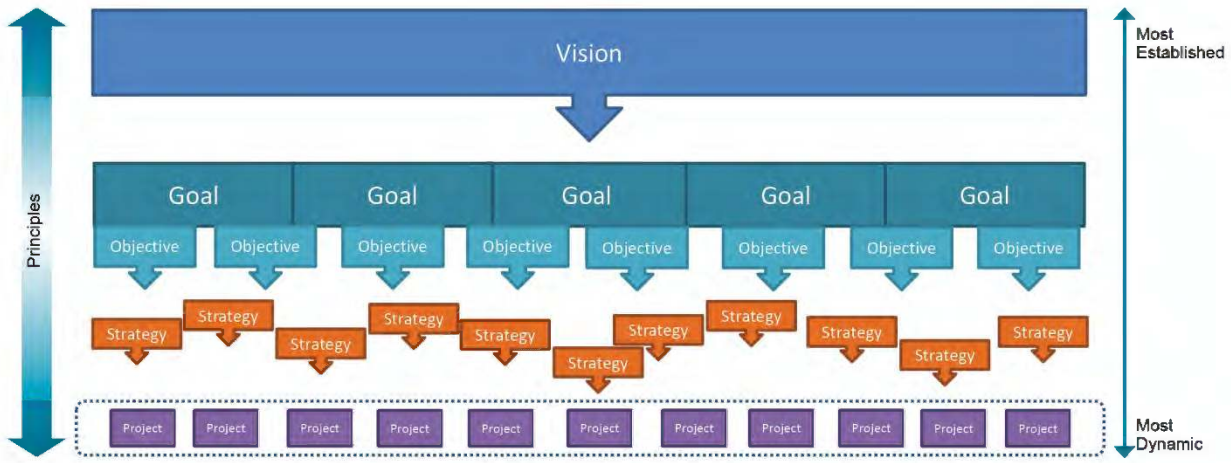


Figure 5-1. ARB IRWMP Framework

The VISION is a compelling description of the future end state (in a time horizon) of the Region that will result from proactive, strategic activities undertaken for the IRWMP. The vision is the most established and agreed upon planning concept. Instead of relying on individual and fragmented attempts to manage water, having a unifying and integrated vision with greater foresight is necessary to coordinate projects, or actions, to successfully and efficiently manage water resources. The vision is shown as a single box to demonstrate its singular and unifying nature.

GOALS represent the desired "end state" of activities and support the overall vision. Goals are meant to span the entire vision. If goals are met, the Region can reach its vision. The vision and goals provide the backbone of the entire planning process and are considered the most agreed-upon and established concepts for the Region.

PRINCIPLES are statements that articulate shared organizational values, support the vision, and serve as a basis for decision making. While not in the direct hierarchy of the Framework as shown above, the principles are foundational and provide guidance on how all stakeholders should consider future planning and implementation of programs and projects. The Framework graphic shows that our principles should permeate throughout the Framework.

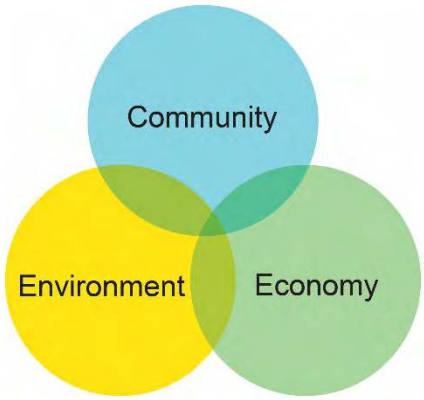
OBJECTIVES establish the intent of the Region and the IRWM planning effort, and are geared toward future action. Objectives help the Region determine if it has achieved its goals. Although they strive to be comprehensive, there is recognition that the sum of the objectives may not completely address all aspects of the Region's water management issues, and thus, gaps are shown in between each objective. However, the objectives represent the Region's current and best intent to address all of its issues. Although somewhat stable, objectives are more dynamic than the vision or goals, and it is foreseeable that objectives would be reviewed periodically in future planning updates, to continuously strive to meet the goals and vision.

STRATEGIES are general approaches or methods for achieving objectives and resolving specific issues. Strategies speak to the question "How will we go about accomplishing our objectives?" (U.S. Environmental Protection Agency [EPA] 2012). Multiple strategies may be employed to achieve an objective; likewise, a single strategy may help make progress toward multiple objectives. Whenever possible, strategies should be measureable, state a distinct target, have a timeline, and be flexible. Strategies are more dynamic than objectives and are meant to be regularly revisited and revised as necessary.

PROJECTS help the Region meet its objectives by implementing the strategies. Projects–or actions–are the most dynamic element of the Framework as they can be added or subtracted at any time. However, while there may be a variety and an extensive list of projects at various levels of readiness to proceed, implementing projects may not completely fulfill individual strategies or objectives, much less the goals or vision. It is the intent of the Region to actively support multi-benefit projects that align with the Region's larger vision.

The Framework also depicts how dynamic the Framework components should be. Those components at the top (vision, goals, and objectives) went through a lengthy process of development, and should not be modified without significant consideration. Strategies and projects are more dynamic compared to the goals, vision, and objectives, and will change more readily over time. Projects and strategies are inevitably influenced by external factors as well, such as funding availability, regulations, laws, changed regional or statewide priorities, environmental conditions, or economic conditions. In contrast, a unifying vision and comprehensive goals are intended to remain stable regardless of such external factors. The process for making changes to the Framework is described in **Section 6.6**.

The 2013 ARB IRWMP Update principles, vision, goals, objectives, and strategies were iteratively developed through a robust public and stakeholder engagement process that employed the full Governance Structure (as described in **Section 4**). The 2018 ARB IRWMP Update Framework was reviewed and revised through a series of meetings, workshops, research, and individual communications that began in spring 2017. Meeting summaries can be found on the Regional Water Authority (RWA) Web site at http://rwah2o.org/programs/integrated-regional-water-management/american-river-basin-irwmp-2018-update/. The remainder of this section is a summary of the content developed at these stakeholder meetings. Revisions were made to the Framework to reflect the 2016 IRWMP Standards, changing conditions in the Region, and updates of existing projects and programs implemented in the ARB as well as new ones. The Framework now addresses legislative initiatives and mandates that affect water resources, such as the Sustainable Groundwater Management Act (SGMA), California Human Right to Water Bill (Assembly Bill (AB) 685), and the Storm Water Resource Planning Act (Senate Bill (SB) 985).



5.2. Vision

The ARB IRWMP vision is:

> *The American River Basin Region will responsibly manage water resources to provide for the lasting health of our community, economy, and environment.*

The last three components, "community, economy, and environment" specifically refer to the three pillars or the "triple bottom line" of sustainability. The concept of social equity was determined better coined as "community" in the context of the Region. Water inequality is not an identified issue in this Region, but maintaining and improving the health and vitality of our communities as well as the community stewardship of water resources are still important concerns. The vision statement also emphasizes responsible management of water into the indefinite future.

5.3. Goals

The ARB IRWMP goals support the vision, and are presented and described in **Table 5-1**.

Table 5-1. ARB IRWMP Goals

Goal	Description
Provide reliable and sustainable surface water and groundwater resources, sufficient to meet the existing and future needs of the Region.	This goal focuses on water quantity, encompassing both the supply and demand aspects of water resources. Concepts such as providing sufficient drinking water, increasing efficiency, increasing the use of recycled water, reducing demand, and developing resilient water systems are covered by this goal. It is also inclusive of water resources for human and ecosystem needs and ensuring the human right to water.
Protect and enhance the quality of surface water and groundwater.	This goal focuses on the water quality aspects of water resources, which includes management of point and nonpoint source pollution and water and wastewater treatment. Although water quantity and quality are closely linked, the two goals attempt to distinguish and highlight both concerns.
Protect and enhance the environmental resources of the watersheds within the Region.	This goal focuses on environmental resources of the watersheds, which includes consideration of vegetation, habitat, and ecosystem functions. This goal directly relates to the environment pillar of sustainability, also included in the vision statement.
Protect the people, property, and environmental resources of the Region from the impacts of flood damage.	This goal recognizes that floods pose significant natural disaster risks in the Region and that the Region needs an integrated effort to mitigate and adapt to these risks. The Region also recognizes that flood management and environmental management can be achieved in ways that complement one another.
Promote community stewardship of our Region's water resources.	This goal recognizes that we need the active participation of the community to achieve our vision. Education and increased awareness at all levels of the community, from public officials to the general public, is an integral part of implementing the ARB IRWMP.

Key:
ARB IRWMP = American River Basin Integrated Regional Water Management Plan
Region = American River Basin Region

5.4. Principles

The ARB IRWMP principles are:

- Planning for sustainability of our water resources considers all aspects of our watershed. This includes:
  - Strive for balance in environmental, economic, and social impacts and benefits in decision making and actions.
  - Recognize and promote the value of healthy watersheds and ecosystems, and underlying groundwater basins, to provide sustainable water resources.
  - Promote solutions that seek to minimize impacts to the environment.
  - Promote policies and practices that enhance natural watershed functions.

  - Develop projects and programs that allow for the fair treatment of people of all races, cultures, and incomes.

- Achieving multiple benefits through further integration throughout our water resources planning. This includes:

  - Value the entirety of the water cycle and consider all forms of water as a potential resource.

  - Prioritize solutions that are integrated, addressing as many objectives, and providing as many benefits as possible.

  - Promote improved integration of land-use planning and management with water resources management.

  - Collaborate to take advantage of the benefits and synergies of water resource planning at the regional level.

  - Collaborate with other integrated regional water management (IRWM) regions.

- Employing adaptive management techniques and active monitoring to manage our water resources. This includes:

  - As needed, adapt planning processes and use the best available information, data, and tools as feasible, to address changes in a dynamic system and reflect evolving science, changing regulations, and/or program evaluation results.

  - Regularly monitor and evaluate to determine if objectives and targets are met.

  - Incorporate mitigation and adaptation measures in all aspects of planning and implementation in preparation for projected future changing climate conditions.

- Engaging a broader community as stewards of our water resources. This includes:

  - Promote transparency and open communication.

  - Build community awareness and encourage participation in stewardship of water resources.

  - Promote and educate on the value of pollution prevention and source reduction.

- Planning for hydrologic variability and uncertainty. This includes:

- Promote policies and practices that consider future climate scenarios and changing hydrologic conditions in the operations of existing and future projects.

- Incorporate the best-available data on climate change and hydrology in all aspects of planning and implementation.

- Collaborate to develop regional solutions to hydrologic variability and uncertainty.

5.5. Objectives

In revising the 2018 ARB IRWMP Update objectives, RWA and the Planning Forum considered the objectives of the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), the water efficiency goals of the *20x2020 Water Conservation Plan* and Executive Order B-37-16, the requirements of California Water Code Section 10540(c), the strategies outlined in the AB 32 Scoping Plan developed by the California Air Resources Board (CARB), the objectives of SGMA, the California Human Right to Water Bill, and the 2016 IRWMP Standards. During the update process, objectives were categorized by the primary goal each could help achieve. Although it was recognized early on that objectives often could help meet multiple goals, the categorization was retained to facilitate stakeholder discussions.

The 2018 ARB IRWMP Update includes revisions to the 17 objectives originally identified in the 2013 plan. In addition, a new objective was developed to reflect implementation of SGMA and regional actions to sustainably manage the Region's groundwater resources. The 18 ARB IRWMP objectives are presented and described in **Table 5-2**.

Table 5-2. ARB IRWMP Objectives

Objectives	Description
1. Meet current and future water resources needs.	This objective includes actions to maintain, replace, and construct facilities, and to implement programs and activities that are adaptive to the amount, intensity, timing, quality, and variability of runoff and recharge in order to reliably meet varied water resources needs throughout the Region.
2. Increase water use efficiency.	This objective includes actions to reduce the amount of water necessary for a given purpose and to comply with mandated efficiency targets. Water use efficiency has the potential added benefit of reduced energy consumuption and ultimately reduced greenhouse gas emissions, in support of AB 32 strategies.
3. Improve ability to reliably meet water needs during dry or emergency conditions.	This objective focuses actions for greater operational flexibility in consideration of hydrologic variability and climate change (including sea level rise). It also recognizes the need to improve and adapt to conditions following extreme hydrologic events, such as prolonged droughts or flooding.
4. Increase the use of recycled water for appropriate uses.	This objective aims to encourage the expansion of recycled water use and to explore its potential benefits.

Table 5-2. ARB IRWMP Objectives (contd.)

Objectives	Description
5. Remediate contaminated groundwater and reuse it to the extent feasible.	This objective refers to cleanup initiatives of groundwater contamination plumes and investigating beneficial uses of remediated water.
6. Improve protection of beneficial uses of surface water and groundwater.	This objective addresses water quality issues and covers potential actions such as improving wastewater treatment and infrastructure, meeting discharge standards, improving stormwater runoff quality, and controlling sources of groundwater contamination.
7. Recharge and reuse stormwater and urban runoff to the extent practicable.	This objective encourages considering runoff as a potential resource and identifying locations for groundwater recharge.
8. Maintain and improve the ecosystem function of area streams and watersheds.	This objective highlights ecosystem function, recognizing that habitat restoration and related efforts may not improve the entire ecosystem function, which is also a vital component of environmental sustainability.
9. Maintain and improve habitat of area watersheds.	This objective includes actions that maintain, improve, and conserve terrestrial, riparian, and aquatic habitats, such as implementing restoration plans and mimicking pre-project hydrologic flow patterns.
10. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.	This objective applies to both the environmental resources and flood goals, with the recognition that preserving remaining riparian habitat also allows for flexible flood management.
11. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.	This objective signifies the importance of increasing the capacity of the flood system to handle extreme events, whether through increased conveyance and/or temporary storage.
12. Maintain and improve levees and other flood-related infrastructure to reduce flood risk.	This objective focuses on the need to maintain and improve levees and other flood-related infrastructure throughout the Region, actions that are often postponed even when the structures are not up to standard.
13. Maintain and restore/reconnect floodplains to provide flood storage and other benefits to reduce flood risk and increase groundwater recharge.	This objective recognizes that connecting floodplains would increase total habitat area as well as their connectivity while providing better flood protection and increasing groundwater recharge.
14. Improve management of residual flood risks.	This objective recognizes that even after all efforts to reduce the flood risk are completed, this risk of flood can never be completely eliminated. Residual risk is the exposure to loss remaining after other known risks have been countered, factored in, or eliminated.
15. Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.	This objective covers the need to increase public and public officials' awareness of all water related issues, such as the role of a healthy ecosystem, water efficiency, flood risk, water quality, and pollution prevention. It also recognizes the role that public awareness plays in ensuring safe, clean, affordable, acccessible water for every individual in the Region.
16. Improve integration of water resources planning with land-use planning.	This objective recognizes the need to collaborate with land-use planning departments to effectively manage water resources and overall sustainable development into the future. It also recognizes the need to coordinate agricultural and land use planning efforts in order to ensure long-term stewardship of agricultural lands.

Table 5-2. ARB IRWMP Objectives (contd.)

Objectives	Description
17. Increase sharing of information, studies, and reports to further advance integrated regional water management.	This objective deals with issues of lack of sharing of learned knowledge, which perpetuates the single-purpose oriented approach to water use or management. Increased data availability would also lead to better informed decision making.
18. Manage the Region's groundwater basins sustainably.	This objective recognizes the value of the groundwater basins' role in reliably meeting varied water resources needs throughout the Region and preventing undesirable results. In the Region, GSAs will be preparing GSPs or approved alternative plans to ensure basin sustainability.

Key:
AB = Assembly Bill
GSA = groundwater sustainability agency
GSP – groundwater sustainable plan
Region = American River Basin Region

As discussed, the objectives will help the Region evaluate if it is making progress towards achieving its goals. **Table 5-3** correlates each of the objectives with the goal – or goals – it helps meet. **Table 5-3** shows the primary goal an objective meets, distinguishing an objective's direct-versus-indirect effects. For example, Objective 2, "increase water use efficiency" directly helps the Region meet the water resources goal. Simultaneously, increasing efficiency and using less water may have water quality benefits, if more flow can be left in the stream. However, this effect is indirect and thus not marked in **Table 5-3**. Similarly, public outreach and education has been shown to increase residential water use efficiency, which may help the Region meet the water resources goal. While important, this effect is also indirect and is excluded from **Table 5-3**. The ARB IRWMP is a unifying document, necessary because of these integrated, interlocking relationships among regional goals, objectives, and strategies (discussed in **Section 5.6**), but are not shown here for clarity.

While the objectives are numbered for reference, the objectives are not prioritized. Objectives were limited to a manageable number for this purpose. The Region believes each objective to be as important and viable as another; regional objectives are not in competition with each other. Objectives are expected to remain fairly static to guide future action. They should not play a role in encouraging a certain type of project or action over another. Objectives also influence one another, and meeting one objective will also affect the Region's progress toward meeting another objective. An appropriate and comprehensive approach to water management should address all or most objectives simultaneously.

Table 5-3. Relationships of ARB IRWMP Objectives and Goals

Objectives	Goals				
	Provide reliable and sustainable surface water and groundwater resources, sufficient to meet the existing and future needs of the region.	Protect and enhance the quality of surface water and groundwater.	Protect and enhance the environmental resources of the watersheds within the region.	Protect the people, property, and environmental resources of the region from the impacts of flood damage.	Promote community stewardship of our region's water resources.
1. Meet current and future water resources needs.	●				
2. Increase water use efficiency.	●				
3. Improve ability to reliably meet water needs during dry or emergency conditions.	●				
4. Increase the use of recycled water for appropriate uses.	●				
5. Remediate contaminated groundwater and reuse it to the extent feasible.	●	●			
6. Improve protection of beneficial uses of surface water and groundwater.		●			
7. Recharge and reuse stormwater and urban runoff to the extent practicable.		●			
8. Maintain and improve the ecosystem function of area streams and watersheds.			●		
9. Maintain and improve habitat of area watersheds.			●		
10. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.			●	●	
11. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.				●	
12. Maintain and improve levees and other flood related infrastructure to reduce flood risk.				●	
13. Maintain and restore/reconnect floodplains to provide flood storage and other benefits to reduce flood risk and increase groundwater recharge.			●	●	
14. Improve management of residual flood risks.				●	
15. Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.					●
16. Improve integration of water resources planning with land-use planning.					●
17. Increase sharing of information, studies, and reports to further advance integrated regional water management.					●
18. Manage the Region's groundwater basins sustainably.	●	●	●	●	

Key:
ARB IRWMP = American River Basin Integrated Regional Water Management Plan
Region = American River Basin Region

5.6. Strategies

Strategies are defined as general approaches or methods for achieving objectives and resolving specific issues. Strategies should be measureable whenever possible, state a distinct target and a deadline for when to meet that target, and are flexible. It is recognized that not all strategies are readily quantifiable, but that does not detract from the overall concept or their important role in achieving plan objectives.

Multiple strategies may be employed to achieve an objective; likewise, a single strategy may help make progress toward multiple objectives. An example of these interrelationships among goals-objectives-strategies is presented in **Figure 5-2**. For organizational purposes, the strategies are identified and grouped by their primary goal. However, stakeholders recognize that many strategies apply to numerous goals and objectives. **Table 5-5** shows a full matrix of the relationships between Region objectives and current strategies.

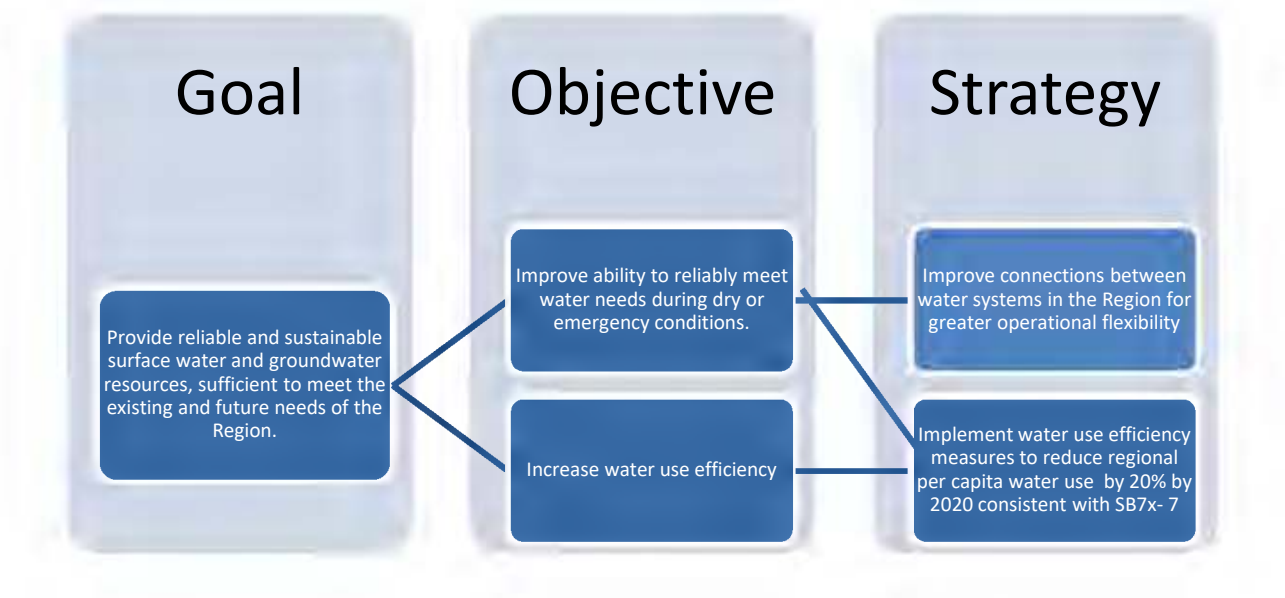


Figure 5-2. Example of Relationships Among a Goal, Objectives, and Strategies

Strategies are meant to be dynamic. A new strategy may be proposed by a stakeholder at any time. The strategy will then be discussed and vetted to all stakeholders before it may be added to the IRWMP. As projects are implemented, RWA will be responsible for tracking progress on these strategies. As the strategies are sufficiently completed or no longer serve a particular purpose, they may be removed from the IRWMP following vetting to all stakeholders.

This flexible and adaptable nature of these strategies allows the IRWMP to adapt and respond to a variety of macro-trends impacting the Region, including:

- The changing demographics of the Region

- Changes in technology
- Climate change
- Changes in state of California (state) and federal policy
- Funding uncertainty
- Aging infrastructure

While an update to goals or objectives will be more time and effort intensive, the Region can adopt a new strategy and implement it on shorter notice.

The 2013 ARB IRWMP Update included a broad range of strategies developed by stakeholders to support the Region's vision, goals, and objectives. The 2018 ARB IRWMP Update includes both new strategies and revisions to the 2013 strategies, to reflect the current regional setting and changing environment. This comprehensive range of water management strategies represents the regional outlook and vocabulary to articulate measurable actions to connect objectives to project implementation. The strategies described herein are living and adaptive, and the Region expects to continue to add, revise, and delete strategies fluidly. The strategies summarized in **Table 5-4** represent a current "snapshot" of strategies for the Region. These strategies are further described in **Sections 5.6.1** through **5.6.5**.

Table 5-4. ARB IRWMP Strategies

WATER RESOURCE STRATEGIES
WR1. Increase surface water treatment capacity to 839 million gallons per day by 2035.
WR2. Increase groundwater production capacity to 550 MGD by 2035.
WR3. Increase distribution system water storage capacity to 525 MG by 2035.
WR4. Improve connections between water systems in the Region for greater operational flexibility.
WR5. Increase use of recycled water to 65,000 AFY by 2035.
WR6. Implement water use efficiency measures to reduce regional per capita water use by 20% by 2020 consistent with SB7x-7.
WR7. Develop and adopt GSPs or alternative GSPs by 2022.
WR8. Complete an analysis of expanded conjunctive use potential in the Region by 2022.
WR9. Increase the capture of stormwater runoff for infiltration or reuse, where feasible.
WATER QUALITY STRATEGIES
WQ1. Meet all appropriate treatment standards and discharge requirements for wastewater treatment and other point discharges.
WQ2. Meet all nonpoint discharge requirements.
WQ3. Reduce source water pollution.
WQ4. Reduce the volume, flows, and pollutant loads of stormwater runoff.
WQ5. Reduce the extent of groundwater contamination, consistent with regulatory cleanup programs.
WQ6. Increase use of remediated groundwater for beneficial uses.
WQ7. Coordinate with the CV-SALTS program to identify potential regional issues related to salt and nutrient management.
ENVIRONMENTAL RESOURCES STRATEGIES
ER1. Restore functional riparian and wetland habitat.
ER2. Conserve functional riparian and wetland habitat.
ER3. Implement local habitat and watershed conservation and restoration plans.
ER4. Improve the quality, quantity, and connectivity of habitat communities.
ER5. Actively manage the spread of invasive species.
ER6. Increase access, quality, and quantity of anadromous and native fish habitat.
ER7. Improve flow management, water quality, and temperature of area streams and rivers consistent with the Water Forum Agreement.
ER8. Improve groundwater levels to support and improve habitat.

Table 5-4. ARB IRWMP Strategies (contd.)

FLOOD MANAGEMENT STRATEGIES
FM1. Provide a 200-year level of flood protection for urban areas by 2025, where feasible.
FM2. Improve level of flood protection for levee-protected small communities and agricultural lands in the Region, where feasible.
FM3. Promote restoration and conservation of floodplain function.
FM4. Support a Folsom Dam Water Control Manual update that balances flood control, water, environmental and recreational needs.[1]
FM5. Coordinate with inter-jurisdictional, regional flood management efforts.
FM6. Coordinate flood emergency planning and response efforts.
COMMUNITY STEWARDSHIP STRATEGIES
CS1. Increase availability and access to educational material on sustainable water resources.
CS2. Identify, summarize, and discuss the potential for partnering of existing regional outreach and education programs by 2021.
CS3. Identify natural recharge areas and relay that information to relevant land-use planning agencies by 2022, encouraging the preservation of recharge areas.
CS4. Promote the use of LID methods, where appropriate.
CS5. Provide annual updates to city and county governments and other local agencies on accomplishments and continued challenges of integrated water management.
CS6. Increase engagement of community leaders (e.g., using community-based social marketing where applicable).
CS7. Increase engagement of agricultural stakeholders and private water users.

Key:
AFY = acre-feet per year
CV-SALTS = Central Valley Salinity Alternatives for Long-Term Sustainability
LID = low impact development
MG = million gallons
MGD = million gallons a day

Note:
Nonstructural improvements–Projects that are intended to reduce or eliminate susceptibility to flooding by preserving or increasing the flood-carrying capacity of floodways, and include such measures as levees, setback levees, floodproofing structures, and zoning, designating or acquiring flood prone areas. (California Water Code Section 79068(a))

Structural improvements – Projects that are intended to modify flood patterns and rely primarily on constructed components and include such measures as levees, floodwalls, and improved channels. (California Water Code Section 79068(b))

[1] Note, as of this writing, the USACE is finalizing a revised WCM that is balanced and incorporates forecast based operations.

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Table 5-5. Relationships of ARB IRWMP Strategies and Objectives

Strategies	Objectives																	
	Meet current and future water resources needs.	Increase water use efficiency.	Improve ability to reliably meet water needs during dry or emergency conditions.	Increase the use of recycled water for appropriate uses.	Remediate contaminated groundwater and reuse it to the extent feasible.	Improve protection of beneficial uses of surface water and groundwater.	Recharge and reuse stormwater and urban runoff to the extent practicable.	Maintain and improve the ecosystem function of area streams and watersheds.	Maintain and improve habitat of area watersheds.	Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.	Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.	Maintain and improve levees and other flood related infrastructure to reduce flood risk.	Maintain and restore/reconnect floodplains to provide flood storage and other benefits to reduce flood risk and increase groundwater recharge.	Improve management of residual flood risks.	Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.	Improve integration of water resources planning with land-use planning.	Increase sharing of information, studies, and reports to further advance integrated regional water management.	Manage the Regions groundwater basins sustainably.
WR1. Increase surface water treatment capacity to 839 MGD by 2035	●																	
WR2. Increase groundwater production capacity to 550 MGD by 2035.	●		●															
WR3. Increase distribution system water storage capacity to 525 MG by 2035.	●	●	●															
WR4. Improve connections between water systems in the Region for greater operational flexibility.	●	●	●															
WR5. Increase use of recycled water to 65,000 AFY by 2035.	●	●	●	●														
WR6. Implement water conservation to reduce regional per capita water use by 20% by 2020 consistent with SB7x-7.	●		●															
WR7. Develop and adopt GSPs or alternative GSPs by 2022.	●		●	●	●	●	●	●	●				●		●			●
WR8. Complete an analysis of expanded conjunctive use potential in the Region by 2022.	●		●			●	●											●
WR9. Increase the capture of stormwater runoff for infiltration or reuse, where feasible.	●	●	●	●		●	●		●									
WQ1. Meet all appropriate treatment standards and discharge requirements for wastewater treatment.	●					●												
WQ2. Meet all nonpoint discharge requirements.	●					●												
WQ3. Reduce source water pollution.	●					●												
WQ4. Reduce the volume, flows, and pollutant loads of stormwater runoff.	●						●		●									●
WQ5. Reduce the extent of groundwater contamination, consistent with regulatory clean-up programs.	●					●												
WQ6. Increase use of remediated groundwater for beneficial uses.	●				●													●
WQ7. Coordinate with the CV-SALTS program to identify potential regional issues related to salt and nutrient management.	●					●											●	
ER1. Restore functional riparian and wetland habitat.	●					●		●	●	●								
ER2. Conserve functional riparian and wetland habitat.	●					●		●	●	●								
ER3. Implement local habitat and watershed conservation and restoration plans.	●					●		●	●	●								

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Table 5-5. Relationships of ARB IRWMP Strategies and Objectives (contd.)

Strategies	Objectives																		
	Meet current and future water resources needs.	Increase water use efficiency.	Improve ability to reliably meet water needs during dry or emergency conditions.	Increase the use of recycled water for appropriate uses.	Remediate contaminated groundwater and reuse it to the extent feasible.	Improve protection of beneficial uses of surface water and groundwater.	Recharge and reuse stormwater and urban runoff to the extent practicable.	Maintain and improve the ecosystem function of area streams and watersheds.	Maintain and improve habitat of area watersheds.	Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.	Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.	Maintain and improve levees and other flood related infrastructure to reduce flood risk.	Maintain and restore/reconnect floodplains to provide flood storage and other benefits to reduce flood risk and increase groundwater recharge.	Improve management of residual flood risks.	Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.	Improve integration of water resources planning with land-use planning.	Increase sharing of information, studies, and reports to further advance integrated regional water management.	Manage the Regions groundwater basins sustainably.
ER4. Improve the quality, quantity, and connectivity of habitat communities.	●							●	●										
ER5. Actively manage the spread of invasive species.	●							●	●										
ER6. Increase access, quality, and quantity of anadromous and native fish habitat.	●							●	●										
ER7. Improve flow management, water quality, and temperature of area streams and rivers consistent with the Water Forum Agreement.	●					●		●	●										
ER8. Improve groundwater levels to support and improve habitat.	●							●	●	●									●
FM1. Provide a 200-year level of protection for urban areas by 2025, where feasible.	●										●								
FM2. Improve level of protection for levee-protected small communities and agricultural lands in the Region, where feasible.	●										●								
FM3. Promote restoration of floodplain function.	●									●	●		●		●				
FM4. Support a Folsom Dam Water Control Manual update that balances flood control, water, environmental and recreational needs.	●	●	●			●		●	●		●								
FM5. Coordinate with inter-jurisdictional, regional flood management efforts.	●										●	●	●	●		●	●		
FM6. Coordinate flood emergency planning and response efforts.	●													●					
CS1. Increase availability and access to educational material on sustainable water resources.	●														●				
CS2. Identify, summarize, and discuss the potential for partnering of existing regional outreach and education programs by 2021.	●														●				
CS3. Identify natural recharge areas and relay that information to relevant land-use planning agencies by 2022, encouraging the preservation of recharge areas.	●					●	●									●			
CS4. Promote the use of Low Impact Development (LID) methods, where appropriate.	●					●	●	●	●						●	●	●		
CS5. Provide annual updates to city and county governments and other local agencies on accomplishments and continued challenges of integrated water management.	●														●	●	●		
CS6. Increase engagement of community leaders (e.g., using community based social marketing where applicable.)	●														●		●		
CS7. Increase engagement of agricultural stakeholders and private water users.	●	●												●	●	●	●		

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5.6.1. ARB Water Resource Strategies

5.6.1.1. WR1. Increase Surface Water Treatment Capacity to 839 MGD by 2035

The need for increased surface water treatment capacity in the Region stems from two primary drivers: (1) the need to accommodate planned urban growth, and (2) the need to more fully implement regional conjunctive use operations for regional water supply reliability. This strategy envisions a combination of new construction, and repair and maintenance of old infrastructure. The strategy was developed through a survey of public water suppliers in the Region. Current capacity is approximately 739 million gallons per day (MGD), so the target represents an increase of about 100 MGD.

Region-wide, urban water demands in 2030 are expected to be 718[2] thousand acre-feet (TAF) per year (see **Section 2.9.1.2**), and the increased need for surface water treatment and delivery is a certainty. The Region in aggregate has sufficient surface water rights and contracts to meet future needs; however, overcoming legal and institutional constraints (infrastructure, place of use, perfection of rights, etc.) associated with surface water rights and contracts may preclude surface water delivery to the entire Region. In addition, California's recent historic drought illustrates potential risks to agencies' water supplies, especially paired with uncertainty in hydrologic conditions and climate variability caused by climate change. For example, in 2015 low Folsom Reservoir storage revealed significant vulnerabilities related to the ability to divert water from that location. Continued surface water deliveries are expected to be a significant source of regional water supply; however, the Region recognizes the need for adaptive management, diversification of diversion locations, and associated surface water treatment plants. In addition to serving the needs of planned growth directly, additional surface water treatment capacity is needed to more fully implement (in combination with other strategies) the regional conjunctive use program, first prescribed by the Water Forum Agreement (WFA) in 2000.

5.6.1.2. WR2. Increase Groundwater Production Capacity to 550 MGD by 2035

The need for increased groundwater production capacity in the Region stems from three primary drivers: (1) the need to accommodate planned urban growth; (2) the need to more fully implement regional conjunctive use operations for regional water supply reliability, and (3) the need to replace groundwater supplies (at alternate locations) lost to contamination. This strategy envisions new, expanded, and rehabilitated facilities. The strategy was developed through a survey of public water suppliers in the Region. Current capacity is approximately 400 MGD, so the target represents an increase of about 150 MGD.

[2] Due to the 2012-2016 California drought and the resulting water use efficiency measures, the projected annual water demands reported in the 2015 Urban Water Management Plans (UWMP) are expected to differ significantly from what is to be reported in the 2020 UWMPs.

Region-wide, urban water demands in 2030 are expected to be 718[3] TAF per year (see **Section 2.9.1.2**), and the increased need for groundwater production is a certainty. The Region is generally underlain by robust groundwater supplies that have historically been managed and balanced by the Sacramento Groundwater Authority (SGA), Sacramento Central Groundwater Authority (SCGA), and the Western Placer County Groundwater Management Plan Partners (City of Roseville, City of Lincoln, Placer County Water Agency, Nevada Irrigation District, and California American Water) to preserve and protect these important resources. Following the adoption of SGMA in 2014, 26 GSAs have been formed to sustainably manage the three groundwater subbasins underlying the Region. Each GSA is responsible for developing and implementing their own or a joint GSP to maintain sustainable yield and prevent undesirable results in the subbasin(s) they manage.

Although both Sacramento and Placer counties have policies that require supplemental sources of supply to support "no net groundwater take" for planned growth, groundwater is expected to continue to be a significant source of regional water supply.

Additional groundwater production capacity is needed to more fully implement (in combination with other strategies) the regional conjunctive use program, as described previously. Increased implementation of conjunctive use will be critical to meeting regional water needs for both water supply and environmental water needs during shortage conditions, especially considering changes in surface water availability due to climate change. Regional groundwater recharge will be an important part of groundwater basin management, and will include a variety of stormwater and dry weather runoff capture projects, field flooding, floodplain restoration, or in lieu recycled water projects. Replacement groundwater supplies will be needed where existing groundwater production capacity is impacted by contamination from known plume migration or new sources of contamination. This strategy may also increase energy efficiency and greenhouse gas reductions through the integrated management of water, as described in CARB's AB 32 Scoping Plan.

5.6.1.3. WR3. Increase Distribution System Water Storage Capacity to 525 MG by 2035

The water purveyors in the Region have various operational strategies and practices for using local groundwater and/or surface water supplies to meet water demands. Water delivery system needs depend on topography, water quality, and demand patterns. Many agencies make use of storage reservoirs to balance diurnal flows and variable demands while other agencies rely on groundwater production and direct delivery to meet variable demands. While increased storage is generally desirable from an operational

[3] Due to the 2012-2016 California drought and the resulting water use efficiency measures, the projected annual water demands reported in the 2015 UWMPs are expected to differ significantly from what is to be reported in the 2020 UWMPs.

perspective, changes in regional electricity pricing to time-of-use rates may be a significant driver for investing in additional water storage capacity. As peak water and peak power demands roughly coincide, there will likely be increased incentives to avoid peak power rates by treating and storing water at off-peak times. Also, as water suppliers in the Region continue to expand the regional conjunctive use program and interconnect their respective systems, storage reservoirs can be valuable tools to balance line service pressures, water demands, and water quality needs. Regional stormwater runoff capture and use, floodplain restoration, or in lieu recycled water projects may also provide additional opportunities to recharge and store water in groundwater basins. Conjunctive use may also increase energy efficiency and greenhouse gas reductions through the integrated management of water, as described in CARB's AB 32 Scoping Plan. The strategy was developed through a survey of public water suppliers in the Region. Current capacity is approximately 400 MGD, so the target represents an increase of about 125 MGD.

5.6.1.4. WR4. Improve Connections Between Water Systems in the Region for Greater Operational Flexibility

Section 2.8 describes individual water suppliers and their known system interconnections with adjoining agencies. In some cases, these connections are for direct delivery (wholesaler to retailer), but in many cases the interconnections are for emergencies. As the Region more fully implements the regional conjunctive use program, agencies will likely want to optimize their water supplies and facilities, especially with adjoining agencies so as to not overbuild capacity or duplicate facilities. Further, policies, water service contracts, or other agreements may contain timing or volumetric constraints that are more efficiently and effectively addressed by multiple agencies to more fully optimize resource use—again making increased system interconnections increasingly important. Operational flexibility also better prepares the Region for water shortages and climate change. This strategy may also increase energy efficiency and greenhouse gas reductions through the integrated management of water, as describe in CARB's AB 32 Scoping Plan.

5.6.1.5. WR5. Increase use of Recycled Water to 65,000 AFY by 2035

Recycled water is currently used to the extent practicable in the Region, considering the current availability of Title 22 supplies. As a nearly 100 percent reliable source of supply, recycled water is expected to eventually play an important role in the Region for irrigation and industrial (process) water, and for direct and indirect groundwater augmentation. National Pollutant Discharge Elimination System (NPDES) permit requirements have become more stringent and most regional wastewater plants will produce Title 22 effluent at a minimum, in the very near future. The City of Roseville has a robust recycled water system, and Sacramento Regional County Sanitation District (SRCSD) has set a goal to produce and reuse upwards of 55 MGD of recycled water per year by 2020. Because approximately 65 percent of regional water use is outdoors (irrigation), recycled water supplies are expected to offset or replace the need for other surface

and/or groundwater sources, either directly or indirectly. Future challenges to fully using recycled water include construction of new infrastructure as well as gaining social acceptance of this alternate water resource. CARB's AB 32 Scoping Plan also specifically promotes the reuse of wastewater as a means of increasing energy efficiency and reducing greenhouse gas emissions consistent with SB7x-7.

5.6.1.6. WR6. Implement Water Use Efficiency Measures to Reduce Regional Per Capita Water Use by 20 Percent by 2020, Consistent with SB7x-7

As demonstrated by the historic drought experienced in California from 2012 through 2016, demand reduction is an integral part of water supply management responses to shortage and it will become increasingly important as water supplies become less reliable. The Water Conservation Act of 2009 (SB 7X-7) established a water conservation target of 20 percent (by urban water supply agency, per capita from a baseline reported to the California Department of Water Resources (DWR) in 2010) by the year 2020 to meet statewide water resource objectives. To track progress toward the 2020 target, water agencies were required to meet an intermediate milestone of at least a 10 percent savings in per capita water use by 2015. This interim 2015 goal was met by each urban water supplier in the Region.

After several years of historic drought, Governor Edmund G. Brown Jr. declared a drought state of emergency on January 17, 2014 and directed the California State Water Resources Control Board (State Water Board) to adopt emergency regulations. These regulations included mandates to urban water suppliers to implement drought response plans and limit outdoor irrigation and other water practices. On April 1, 2015, Governor Brown issued a series of executive orders to continue to address the state's severe drought conditions. These included Executive Order B-29-15, which mandated a 25 percent statewide reduction in potable urban water use. Urban water suppliers in the Region rose to the challenge, implementing a number of conservation measures and reducing water use by an average of 30 percent during the year the conservation mandate was in place. In 2016, Sacramento-area urban water supplier and residents continue to conserve and reduced water use by 25 percent, compared to 2013. Although the drought state of emergency was lifted in April 2017, water conservation remains a central focus in California and the Region.

Executive Order B-37-16, signed in May 2016, initiated a process to establish long-term conservation targets throughout California. The framework to implement Executive Order B-37-16 outlined a suite of actions that could be implemented under existing authorities and, where necessary, recommended additional actions that could be implemented with new or expanded authorities. The Legislature split authorities and drought planning between SB 606 and AB 1668, signed May 2018. The new legislation has no effect on SB7x-7 implementation. However, the bills do provide additional authorities and requirements

related to urban water use objectives, water use reporting, and development of new urban water use efficiency standards.

The Region and participating agencies have been proactively engaged in water conservation programs well in advance of SB7x-7 and the recent emergency regulations promulgated during the drought, both collectively through the RWA's Water Use Efficiency Program (WEP) and individually, to conserve water and manage demands. Water agencies in the Region have realized the benefits of regional coordination between agencies and across water sources to meet water conservation targets. This coordination has led to a better understanding of regional water savings potential and the resulting effects on the Region's water sources. In addition, agency responses to the drought have revealed additional opportunities for collaboration and cooperation to enhance regional reliability.

These efforts have and continue to reduce per-capita water use within the Region. Participating agencies continue to install meters to support volumetric pricing, expand recycled water programs, and reduce outdoor water use. The RWA Drought Planning Task Force was formed in May 2016 to support development of the North American Basin Regional Drought Contingency Plan (NAB RDCP). In addition, many agencies have developed individual Water Shortage Contingency Plans that define water use reduction stages during emergency conditions. In the coming years, the Region will continue to implement measures and programs to strengthen local drought resilience, eliminate water waste, and improve agricultural water use efficiency and drought planning.

The Region also recognizes that water conservation may increase energy efficiency and reduce greenhouse gas emissions, contributing the Region's and state's climate action plan goals. CARB's AB 32 Scoping Plan states that energy efficiency and water conservation strategies are "the primary mechanism to reduce water-related energy use."

5.6.1.7. WR7. Develop and Adopt GSPs or Alternative GSPs by 2022

SGMA was adopted by California lawmakers in 2014. SGMA required, by June 30, 2017, the formation of locally-controlled GSAs in groundwater basins and subbasins (basins) designated as medium or high priority by DWR. Most of the Region overlies the North American, South American, and the Cosumnes groundwater basins. The North American and South American basins are designated as high priority; the Cosumnes Subbasin is designated as medium priority. Therefore, all three basins are subject to the requirements of SGMA. As of the June 30, 2017 deadline, the entirety of the Region's groundwater subbasins are covered by GSAs.

The next step in the SGMA process is to prepare GSPs for each subbasin that will result in sustainable groundwater management as measured by six indicators within 20 years of adoption of the GSP. SGMA allows for one GSP covering an entire subbasin or a series of coordinated GSPs to manage the basin.

The Region and participating agencies recognize the importance of continued collaboration among the GSAs in the future to ensure the sustainable management of the Region's groundwater basins. The RWMG will continue to coordinate with GSAs in their development of GSPs and will consider incorporating relevant changes to the IRWMP to help in successful implementation of the GSPs, including adding specific GSP projects to the ARB IRWMP.

5.6.1.8. WR8. Complete an Analysis of Expanded Conjunctive Use Potential in the Region by 2022

To develop a balanced approach for water supply reliability and environmental protection along the lower American River, regional entities – including business and agricultural leaders, environmentalists, citizen groups, water managers, and local government – joined together as the Water Forum in 1993. Six years of planning culminated in 2000 with the completion of the WFA which prescribed a regional conjunctive use program for Folsom Lake, the lower American River, and the connected groundwater basins in Sacramento County as a means to address the region's long-term resources and environmental protection needs. Since that time, RWA, water agencies, regional stakeholders, and other organizations have been and continue to plan and execute projects, programs, and activities to foster conjunctive use throughout the Region and implement the WFA.

Recently, California's historic drought and increasing hydrologic variability have revealed greater potential risk to agencies' water supplies in the greater Sacramento region than previously assumed. The potential water supply and demand gap can only grow as climate change progresses. To address these risks head-on and explore potential opportunities, water agencies in the Region are collaborating on several planning efforts that will, among other outcomes, help in defining the conjunctive use potential of the ARB to help ensure sustainable water resources. The efforts include:

- **North American Basin Regional Drought Contingency Plan (October 2017)** – The NAB RDCP is a collaborative planning effort to explore opportunities to collaborate and cooperate to enhance regional reliability, and to increase the resiliency of the region's water resources in the face of future climate and drought conditions.

- **Regional Water Authority Regional Water Reliability Plan (ongoing)** – The RWRP is a locally-led effort to identify the most promising regional opportunities to improve water supply reliability

by evaluating opportunities for intra- and interregional transfers and exchanges, to reduce water use, to support interregional groundwater management and conjunctive use efforts, to support recycled water planning, and to use shared infrastructure and resources. The agency-level vulnerability assessments identify existing and future water supply and demand imbalances. Development of the plan included development of evaluation criteria and metrics, and identification of response actions and mitigation strategies at both the agency- and project- levels. The preliminary conjunctive use analysis indicates that using existing infrastructure, region-wide recharge could be increased by up to 63 TAF per year in wet years by offsetting groundwater use with surface water, and region-wide recovery could be increased by up to 58 TAF per year in dry years by offsetting surface water use with groundwater. The RWRP does not consider funding mechanisms to implement a conjunctive use program nor the impacts of future climate change on a conjunctive use program.

- **American River Basin Study (ongoing)** – Cost-shared by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) through its WaterSMART Basin Studies Program, the ARBS is examining strategies to integrate or better coordinate local and federal water management practices, incorporating new scientific information on climate change that are specific for the ARB, and addressing significant recent changes in conditions and regulatory requirements related to the Central Valley Project (CVP) and regional water management. A significant element of the ARBS is to develop hydrology under future climate conditions, which will help better estimate future conjunctive use operations.

- **American River Basin Water Marketing Strategy Project (ongoing)** – Cost-shared by a Reclamation WaterSMART Water Marketing Grant, the ARB Water Marketing Strategy Project will focus on leveraging the potential for regional conjunctive use to further enhance existing regional market transfers through surface water reservoir reoperation and individual groundwater substitution practices. The project will evaluate the potential for water market asset development; determine the infrastructure investments needed to realize that market; and formulate an implementation plan that includes recommendations on governance, reporting and monitoring procedures. A key element of the Water Marketing Strategy Project is to evaluate funding sources available through transfers that could be a significant source of funds to implement a conjunctive use program.

Expanded implementation of conjunctive use will be critical to meeting regional water needs, especially considering changes in upstream snowpack and revised reservoir operating rules due to climate change.

Conjunctive use may also increase energy efficiency and greenhouse gas reductions through the integrated management of water, as describe in CARB's AB 32 Scoping Plan.

5.6.1.9. WR9. Increase the Capture of Stormwater Runoff for Infiltration or Reuse, Where Feasible

Most stormwater and flood management systems are currently designed and operated to capture, channelize, and convey stormwater runoff away from high-value properties and people as rapidly as possible during and after storm events. However, stormwater can also be a resource, if it can be captured and stored. Groundwater basins often provide the most effective means of storing stormwater. Additional benefits of capturing stormwater include the following:

- Increased volume of groundwater in storage regionally for use during shortage periods.
- Attenuation of storm flows. This helps reduce flooding and associated damages to development or habitats in adjacent areas.
- Natural soil treatment processes to remove pollution. This in turn protects and improves receiving water quality and aquatic habitats.

Revising existing stormwater and flood management systems to augment groundwater infiltration will require policy, management, design, and operational modifications. Decentralizing flood management requires collaboration between water and land-use agencies, and potentially making difficult decisions to restrict or redesign development. Some examples of efforts to increase infiltration include the following:

- Decreasing impervious area.
- Increasing use of detention ponds or basins.
- Other onsite capture of stormwater using LID techniques

Stormwater capture and use projects supported through the ARB Storm Water Resource Plan (SWRP) and West Slope SWRP can help improve intersystem connections among ARB agencies. Several goals of the ARB SWRP and West Slope SWRP directly address this regional strategy.

5.6.2. ARB Water Quality Strategies

5.6.2.1. WQ1. Meet all Appropriate Treatment Standards and Discharge Requirements for Wastewater Treatment and Other Point Discharges

Wastewater treatment standards and waste discharge requirements help protect beneficial uses of receiving waters. If not properly treated, wastewater can introduce bacteria, viruses, and nutrient loads into receiving waters, among other contaminants. Excessive concentrations of contaminants can lead to negative ecological and habitat impacts, restrictions on water-based recreation, increased drinking water treatment costs, and, in extreme cases, decrease water supply availability. The Region recognizes that federal and state water quality regulations and standards will continue to change, and this strategy intends to allow for adaptation to such changes. In addition to public wastewater treatment plants (WWTP), private industrial plants must also meet discharge regulations, but are not specified in this strategy because they are not within the Region's purview.

The Clean Water Act (CWA) is implemented and enforced by the United States EPA. The EPA often delegates authority to state agencies (as is the case in California) to assist in implementation. The NPDES permitting is implemented and enforced by the Central Valley Regional Water Quality Control Board (CVRWQCB) for the Region. Within the CWA, the NPDES permit program regulates point source pollution, which is applicable to WWTPs and their effluent and some stormwater discharges. Wastewater treatment standards vary based on receiving waters, but generally secondary treatment (physical and biological treatment) is considered the minimum treatment standard. Tertiary treatment (physical and biological plus filtration) is increasingly common for inland surface water discharges or where effluent is recycled. These standards are expected to become increasingly stringent in the future, potentially including nutrient (nitrogen and phosphorous) removal.

Total maximum daily load (TMDL) is another CWA standard which applies to both point sources and non-point sources (the focus of Strategy WQ2). TMDLs are intended to reduce pollutant loading in 303(d) impaired water bodies for identified, problematic contaminants, for which other efforts or programs have not been sufficient.

Municipal separate stormwater sewer system (MS4) discharges are point discharges that are subject to TMDLs and regulated through MS4 NPDES permits. Improved capture and use of stormwater across the region supports water quality goals for appropriate treatment and discharge standards of urban runoff, including TMDL compliance. Stormwater flows to local watersheds increase pollutant loads, including bacteria, oils and greases, and metals, in local water bodies. Managing stormwater before it reaches natural water channels can reduce contamination. In particular, several key benefits for stormwater capture and use

support this IRWMP goal. For instance, reestablishing natural water drainage and treatment can reduce the velocity, and potentially the volume, of stormwater flows in watersheds. This can result in beneficial effects such as depositing solids that would otherwise reach downstream habitat. Additionally, stormwater capture and use aims to increase filtration and treatment of pollutants in runoff before reaching the Region's rivers and streams, using best management practices and LID to reduce concentrations of pollutants found in stormwater.

SB 985, enacted in November 2014, requires that agencies prepare an SWRP as a condition of receiving funds for stormwater and dry weather runoff capture projects from any bond approved by voters after January 2014. The SWRP Guidelines, developed by DWR, outline the provisions required in each SWRP. SWRPs in the Region include the ARB SWRP and West Slope SWRP. The ARB SWRP was collaboratively developed by RWA, the Valley Foothill Watershed Collaborative, Sacramento Stormwater Quality Partnership, Placer Regional Stormwater Cooperating Group, Florin Resource Conservation District, and Sacramento Area Flood Control Agency. The West Slope SWRP was led by El Dorado County Water Agency, in collaboration with County of El Dorado and the City of Placerville. The ARB SWRP, West Slope SWRP, and associated relevant projects and programs are incorporated into the 2018 ARB IRWMP Update.

5.6.2.2. WQ2. Meet all Nonpoint Discharge Requirements

Nonpoint sources of water pollution include urban (including stormwater) and agricultural runoff. While nonpoint discharges have been found to significantly impact surface water quality, they have been more difficult to regulate because discharge locations are dispersed. Common urban and agricultural nonpoint source contaminants of concern in the Region include pesticides, fertilizer (nutrients), total dissolved solids or salts, and mercury. TMDLs address both point and nonpoint source pollution in water bodies, and this program is described in Strategy WQ1.

Stormwater capture and use benefits that result from SWRP projects and programs include increased filtration and treatment of pollutants in runoff. Rainfall and snowmelt are the primary sources for nonpoint discharges. Improved treatment of stormwater directly supports goals for meeting TMDLs for nonpoint discharges that seek to protect receiving waters. Reducing pollutant loads and the total volume of stormwater that reaches watersheds can support improved watershed quality. As described in WQ1, the ARB SWRP and West Slope SWRP seek to address both nonpoint and point discharges in the Region. The ARB SWRP, West Slope SWRP, and associated relevant projects and programs are incorporated into the 2018 ARB IRWMP Update.

The state's Irrigated Lands Regulatory Program under the Waste Discharge Requirements (WDR) Program regulates discharges from irrigated agricultural lands. These discharges include irrigation runoff, flows from tile drains, and stormwater runoff. WDRs contain conditions requiring water quality monitoring and corrective actions when impairments are found. The Region is developed and urbanized, with the exception of the northwestern and southern agricultural and agricultural-residential areas. Agricultural lands offer groundwater recharge opportunities, as well as being a potentially large source of runoff. Comprehensive coordination across the Region will be necessary to accomplish the water quality and water management strategies identified in this IRWMP.

5.6.2.3. WQ3. Reduce Source Water Pollution

An effective way of managing point and nonpoint source pollution and improving surface water quality is to isolate and/or reduce sources of contamination before these contaminants enter waterways. In contrast to regulations and permits that specifically target agencies, this strategy is dependent upon the general public's behavior and links directly to the need for an increase in awareness. Source pollution reduction is similarly important for agricultural water users as well. Actions that can help reduce source water pollution include, but are not limited to:

- Reducing and controlling the application of pesticides, herbicides, and fertilizer.
- Altering the timing of application of pesticides, herbicides, and fertilizer according to irrigation times and amount, or weather.
- Managing waste/garbage appropriately so it does not enter waterways.
- Maintaining vegetation, buffer strips, water detention areas, and other LID systems between sources of pollution and surface waters to also manage metals, hydrocarbons, and temperature of runoff.

Reducing source water pollution is an integral part of overall water pollution management. The success of this strategy, among other water pollution control strategies, can be measured by monitoring improvements in surface water quality.

Stormwater capture and use projects that increase filtration and treatment in the upstream areas of the Region can support source watershed health. Buffer strips and detention basins are examples of stormwater infrastructure that can reduce both the volume and velocity of runoff containing potential pollutants that ultimately reaches source waters.

5.6.2.4. WQ4. Reduce the Volume, Flows, and Pollutant Loads of Stormwater Runoff

Historically, most stormwater runoff was (and often still is) discharged, untreated, directly into surface water bodies. This type of drainage management results in transport of pollutant loads from anthropogenic sources, as well as substantial erosion and other hydromodification impacts from the increased discharge volumes and flow rates. Retaining runoff on site through infiltration or other capture and use mechanisms can help prevent pollution and hydromodification, thereby restoring water quality benefits. Stormwater capture and reuse projects can also increase water supply, reduce flood risks, protect environmental systems, and enhance communities.

The ARB and West Slope SWRPs identify runoff capture projects that provide water quality benefits. LID and green infrastructure practices are effective tools for retaining runoff on site, as are site design measures such as use or protection of stream setbacks and buffers or planting/preservation of trees. These projects capture and retain/treat runoff, thereby minimizing stormwater discharge volumes, reducing transport of pollutants to water bodies, and protecting beneficial uses. This directly aligns with the Region's NPDES permits, which require LID implementation and focus heavily on protection of water quality and preservation of beneficial uses. In addition, the City of Sacramento's NPDES Permit requires the City to implement a Combined Sewer System Improvement Plan (CSSIP). The CSSIP update evaluated LID implementation and showed that LID can augment the benefits of capital projects to the CSS by reducing runoff volume and potentially attenuating the peak flows entering the system.

Other runoff capture projects can include diverting storm flows from the Region's rivers or tributaries, of which upstream urban runoff is a large contributor, to flood agricultural lands or other large fields for infiltration and groundwater recharge. Diverting these flows will prevent negative hydromodification and water quality impacts farther downstream and reduce downstream erosion and sedimentation, thereby supporting permit requirements for protecting beneficial uses.

5.6.2.5. WQ5. Reduce the extent of groundwater contamination, consistent with regulatory cleanup programs.

There are several locations in the Region where groundwater resources have been impacted by contamination. Some of these sources of contamination are localized, while others are of regional significance. These contamination locations are currently monitored and controlled, and are being remediated by or at the direction of state/federal government agencies. For example, the Aerojet General Corp., McClellan Air Force Base (AFB), and Mather AFB are accountable under the EPA's Superfund Program (Comprehensive Environmental Response, Compensation, and Liability Act). ARB stakeholders and project proponents need to be aware of these contamination sources and be mindful of ongoing prevention and remediation plans so as not to exacerbate existing contamination plumes. In particular, the

water supply agencies should be mindful of groundwater extraction practices that (1) change underlying groundwater elevations (which may remobilize contaminants in the vadose zone of the soil matrix), or (2) change groundwater gradients, which may induce plume migration.

5.6.2.6. WQ6. Increase use of remediated groundwater for beneficial uses.

There are several locations in the Region that have been impacted by groundwater contamination for which there are ongoing and extensive remediation efforts. Remediation efforts entail the extraction of contaminated groundwater, treatment to remove contaminants, and discharge of treated effluent. As contamination impacts the Region's underlying water supplies, it is important to put these remediated waters to beneficial use since some water agencies have had to decommission wells due to groundwater contamination. Depending upon the water quality characteristics of the treated water, remediated water can be used in a variety of ways including landscape irrigation, industrial water, or supplemental supply, in combination with other water supply sources. There are several inter-agency agreements to use remediated water (see **Section 2.9.2.1**). The Region's affected water agencies should monitor contamination, and they may have to cooperate and expand their remediated water program if further groundwater supplies are impacted. Stakeholders are working to develop a quantifiable target for this strategy for the near future.

5.6.2.7. WQ7. Coordinate with the CV-SALTS Program to Identify Potential Regional Issues Related to Salt and Nutrient Management

The CV-SALTS program is a collaborative stakeholder driven and managed program to develop sustainable salinity and nitrate management planning for the Central Valley. Salt, nutrients, (primarily nitrogen and phosphorous), and salinity management are increasingly important water quality and environmental concerns in California. While the Region naturally has lower levels of salts and nutrients compared to other areas of the state, urban and agricultural pollutants are found in the Region's impaired waters. As stated by CV-SALTS, salinity management is needed as part of near and long term sustainable water supply management (CV-SALTS 2013).

A related regulation, the State Board's 2009 Recycled Water Policy aims to address salt and salinity management issues to promote the use of recycled water. All groundwater basins were required to implement Salt and Nutrient Management Plans (SNMP) by 2014, with a possible extension if significant progress had been made by May 2014. Scientific and regulatory tools developed by CV-SALTS and these SNMPs will be incorporated into the objectives and implementation programs of each California EPA region's Basin Plan.

Given the regulatory environment and available resources described above, the Region's stakeholders identified a strategy to coordinate with CV-SALTS to help develop a SNMP for the entire CVRWQCB's

jurisdictional area. This coordination occurred through communication and collaboration with SRCSD, a member of the CV-SALTS executive committee and a leader in the CV-SALTS program. The final SNMP for the CVRWQCB consideration was completed in January 2017 and adopted by the CVRWQCB in March 2017.

On May 31, 2018, the CVRWQCB adopted the Basin Plan Amendments for the Sacramento-San Joaquin River and Tulare Lake Basins to incorporate changes related to CV-SALTS, and approved the related program documents including the staff report and policies. This basin plan amendment is the culmination of over 10 years of efforts to address protection, reduction in degradation, and restoration where feasible of surface waters (for salinity) and for groundwaters (for salinity and nitrates).

Water management agencies that were required to engage in regional salt and nutrient planning efforts per the 2009 Recycled Water Policy will be the most interested in this strategy. This includes the various GSAs in the Region that may want to consider the need for basin assessments of salt and nutrient trends in the future.

5.6.3. ARB Environmental Resources Strategies

5.6.3.1. ER1. Restore Functional Riparian and Wetland Habitat

California, and the Region in particular, have lost the vast majority of the wetlands and riparian forests that existed before the Gold Rush. Ecosystem restoration improves the condition of natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations (DWR 2009). Functioning ecosystems are necessary to sustain natural communities.

Riparian habitats are in transitional areas between terrestrial and aquatic ecosystems and are distinguished by gradients in bio-physical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. Riparian areas are found throughout the Region adjacent to streams, lakes, and estuarine shorelines. Wetland habitats are areas where water covers the soil, or is present either at or near the surface of the soil. Many wetlands are seasonal and may be wet only periodically. The quantity of water present and the timing of its presence in part determine the functions of a wetland and its role in the environment. Even wetlands that appear dry at times for significant parts of the year–such as vernal pools–often provide critical habitat for wildlife adapted to breeding exclusively in these areas.

Restoration of riparian and wetland habitats can provide ecosystem benefits such as water quality improvements, improved in-stream aquatic habitat, recreational opportunities, and increased groundwater recharge. Successful restoration of aquatic, riparian, and floodplain species and communities ordinarily

depends upon at least partial restoration of physical processes that are driven by water. These processes include the flooding of floodplains, the natural patterns of erosion and deposition of sediment, the balance between infiltrated water and runoff, and substantial seasonal variation in stream flow.

Numerous municipal, watershed management, and environmental organizations are active in restoration efforts throughout the Region, often in collaboration with each other (see **Section 2.6.2)**. These projects and programs are often multi-benefit and include flood management and recreational components. Projects that involve riparian and wetland restoration can be found along the American River, Coon Creek, Auburn Ravine, Alder Creek, Laguna Creek (part of the Morrison Stream Group), and the Cosumnes River, among other locations. Multi-benefit projects that conserve riparian and wetland areas can also offer groundwater recharge benefits.

5.6.3.2. ER2. Conserve Functional Riparian and Wetland Habitat

While restoration involves reversing environmental damages, conservation is focused on prevention of damages and the maintenance and protection of existing habitat functions and values. As mentioned in ER1, most original riparian and wetland habitat has been lost. Conserving remaining riparian and wetland habitats in the Region is important for reversing the ongoing trend of environmental decline. Conservation can also prevent the need for more costly restoration in the future. Conservation actions can include acquiring fee title to lands or conservation easements.

While Strategies ER1 and ER2 distinguish between restoration and conservation, in practice, projects often include components of both. Agencies identify areas and habitat to conserve from future development, and initiate restoration work as needed on and along those areas. **Strategy ER1** and **Section 2.6.2** describe some agencies and organizations active in watershed management, habitat restoration, and habitat conservation efforts. Stakeholders are working to develop a quantifiable target for this strategy for the near future.

5.6.3.3. ER3. Implement Local Habitat and Watershed Conservation and Restoration Plans

Region stakeholders and other entities have established numerous local riparian and wetland habitat and watershed conservation and restoration plans (see **Section 2.6.2**). Substantial effort, funding, and local expertise has been put into developing these plans, and implementation of these local efforts is one of the most efficient ways to conserve and restore ecosystems in the Region. These plans are collaborative in nature, which is important for maintaining and improving ecosystems on a regional level. Examples of local plans include the Auburn Ravine/Coon Creek Ecosystem Restoration Plan, the Placer County Conservation Plan, the South Sacramento Habitat Conservation Plan (SSHCP), and others.

5.6.3.4. ER4. Improve the Quality, Quantity, and Connectivity of Habitat Communities

Habitats are the areas where organisms live, including the biotic and abiotic factors that affect it. Ecological communities are composed of populations of different species occupying a particular area, usually interacting with each other and their environment. Riparian and wetland habitats in the Region provide critical ecosystem functions and benefits, but have been reduced in their geographic extent and what remains has been degraded in quality. Large expanses of the Region, and the Central Valley as a whole, lack connectivity between isolated blocks of remaining natural riparian and wetland habitats that support native biodiversity. Habitat connectivity is important for maintaining biological and genetic diversity, allowing seasonal migration or migration in response to habitat losses or climatic shifts, and allowing movement of individual organisms for needed resources. Within the Region, connected riparian corridors are of particular importance. This strategy can be achieved through restoration or conservation actions, as described in **Strategies ER1** and **ER2**.

5.6.3.5. ER5. Actively Manage the Spread of Invasive Species

Nonnative invasive species, which occur in every habitat type throughout the Region, strongly impact sensitive native species. Areas dominated by nonnative weeds prevent native plants from establishing, provide poor habitat quality for wildlife, and discourage recreational uses. Infestations of weed species increase hydraulic roughness during high-flow events, decrease the capacity of floodways, and adversely affect bank erosion and sedimentation processes. Invasive animal species are often able to outcompete native species and impact the food chain.

Active invasive species management can include prevention of invasive species establishment through conservation of existing habitats, regular inspections and monitoring, and eradication programs. Well-designed restoration programs subsequent to eradication are essential to preventing reestablishment of invasive species.

5.6.3.6. ER6. Increase Access, Quality, and Quantity of Anadromous and Native Fish Habitat

Anadromous fish species are those that migrate from the ocean to spawn in freshwater. In the Region, these species include Chinook and Coho salmon, steelhead, Pacific lamprey, sturgeon, striped bass, shad, and others. Other important native fish species include Sacramento sucker, Sacramento pikeminnow, sculpins (prickly and riffle), tule perch, and hardhead. Many of these species are state- and/or federally listed as threatened or endangered. They are inhibited by degraded habitat quality (water quality, temperature, and altered flow regimes), and access to substantial amounts of upstream habitat is impeded by barriers to fish passage. Salmonids provide substantial recreational and cultural value to the Region. Previous efforts to promote spawning in regional streams appear to have been helpful, especially in the American River where

spawning gravels have been placed to support in-stream spawning. Previous Cosumnes River pre-wetting was also effective in supporting connectivity that enabled anadromous fish to reach upstream gravels and spawn successfully.

This strategy can be accomplished by modifying flows, improving water quality and temperature of area streams and rivers (**Strategy ER1** as well as water quality strategies), and by removal of passage barriers, especially to upstream spawning locations. Save Auburn Ravine Salmon and Steelhead, for example, has been active and successful in forming partnerships with Placer County and Nevada Irrigation District to develop alternative migration paths for salmon around barriers. Fishery Foundation (Cosumnes Coalition Partner) worked successfully with the U.S. Fish and Wildlife Service to remove anadromous fish passage barriers at various agricultural and municipal impoundments.

5.6.3.7. ER7. Improve Flow Management, Water Quality and Temperature of Area Streams and Rivers, Consistent with the Water Forum Agreement

Sufficient in-stream flows, water quality, and temperatures are critical for maintaining aquatic habitats and species in the Region. In-stream flows are needed to protect and preserve resources, such as fish, wildlife, and recreation, in a waterway. Natural flow regimes are important factors in the health of aquatic and riparian ecosystems. Aquatic habitats and species are adapted to specific monthly, seasonal, annual, and inter-annual variabilities in flow. Sufficient flows must be available during the spring and fall months when a variety of anadromous fish are in route to the Sacramento-San Joaquin River Delta (Delta) or upstream spawning and rearing grounds.

In-stream flows also need to meet temperature and water quality standards to support aquatic habitats. Water temperature is a major influence on biological activity and growth, and governs the kinds of organisms that can live in rivers and lakes. Aquatic species have preferred temperature ranges; as temperatures get too far above or below this preferred range, the ability of species to survive or perform life cycle functions (such as spawning) declines. Temperature is also important because of its influence on water quality; dissolved oxygen, an essential water quality parameter for aquatic life, is reduced in elevated water temperatures. Pollutants and sediment concentrations are also important for aquatic life. There are many types of pollutants that can affect aquatic life, including pesticides, toxic chemicals, sediments, and nutrients.

By its nature, achieving Strategy ER7 requires collaborative and integrated resources management, and is dependent on progress in other ARB strategies, such as considering environmental flow needs in water operations (such as how dams are operated, see Strategy FM4), addressing water quality concerns (as described and addressed in water quality strategies), and addressing connectivity in areas where

groundwater overdraft drains surface water flows.. The ARB IRWMP effort will continue to bring stakeholders together to address these interdependent concerns.

Stormwater capture and use projects as part of the ARB SWRP will specifically be ranked according to their assessed benefits for reducing peak flows, improving water quality, and improving desired in-stream temperatures for local water bodies. Especially in the urbanized watersheds of the ARB, stormwater capture and use is an important contributor to improving local watershed quality and aquatic habitat. Stormwater capture and use projects in the West SWRP were ranked according to three components: 1) Surface Water Storage, 2) Watershed Management, and 3) Stormwater Management. Projects submitted to West Slope SWRP were grouped into 3 groups (A, B, or C) within one of the three components using multi-benefit metric scoring. Within the "Water Quality" benefit category, projects were evaluated on their ability to increase filtration and/or treatment of stormwater runoff, control nonpoint source pollution, and reestablish natural water drainage and treatment.

5.6.3.8. ER8. Improve Groundwater Levels to Support and Improve Habitat

Maintaining sufficiently elevated groundwater levels supports and improves habitat by providing reliable base flows for streams. It also contributes to the supply of water for springs, seeps, and wetlands or for phreatophytes and other vegetation that reduce soil erosion. This strategy can be accomplished through active groundwater management and conjunctive use (see **Section 2.9.4**), artificial recharge (see Strategy WQ4), and in-lieu recharge projects (requires increases in regional water system efficiency, as discussed for example in Strategy WR4). Stormwater capture can also increase groundwater supplies by supporting aquifer recharge, either in dedicated spreading basins or through landscape infiltration. Additionally, stormwater projects can increase groundwater supplies in-lieu if new newly captured stormwater is used to reduce groundwater pumping requirements and maintain current resources. Making such connections would move the region towards the goal of greater integrated water management, more closely linking stormwater systems with groundwater production operations.

5.6.4. ARB Flood Management Strategies

5.6.4.1. FM1. Provide a 200-Year Level of Flood Protection for Urban Areas by 2025, Where Feasible

The potential for flooding presents significant risks for many areas in California. Floods can cause substantial economic, social, and environmental damage, as well as the potential for loss of life. Several bills, including SB 5, were passed by the State Legislature in 2007 adding to and amending state flood management and land-use laws. These laws were intended to improve local land use and other planning decisions by strengthening the link between flood management and land use.

As part of the flood management legislation passed in 2007, all cities and counties within the Sacramento-San Joaquin Valley will be required to make findings related to the urban (200-year) level of flood protection before entering into a development agreement for a property, approving a discretionary permit or entitlement for any property development or use, approving a ministerial permit that would result in construction of a new residence, or approving a tentative map/parcel map for a subdivision (see California Government Code Sections 65865.5, 65962, and 66474.5). This requirement applies to urban and urbanizing areas, as defined by California Government Code Section 65007, Paragraphs (j) and (k).

After the Central Valley Flood Protection Board's adoption of the Central Valley Flood Protection Plan (CVFPP) in 2012, cities and counties within the Sacramento-San Joaquin Valley had up to 24 months to amend local general plans, and 36 months to amend local zoning ordinances to be consistent with the CVFPP. Subsequently, cities and counties were required to make findings regarding an urban level of flood protection when considering decisions about entering into a development agreement for a property, approving a discretionary permit or entitlement for any property development or use, approving a ministerial permit that would result in construction of a new residence, or approving a tentative map/parcel map for a subdivision with defined exceptions for shallow flooding or flooding from small watersheds. The CVFPP 2017 Update, completed in August 2017, refines the overall near and long-term investment needs established in the 2012 CVFPP, and includes recommendations on policies and funding to support comprehensive flood risk management actions. After 2025, for urban and urbanizing areas protected by State Plan of Flood Control (SPFC) levees, cities and counties must find that the new development is protected to at least the urban level of flood protection.

The Sacramento-San Joaquin Valley encompasses a larger geographic area than the areas currently protected by facilities of the SPFC (SPFC Planning Area). The Region includes lands in the SPFC Planning Area, outside the SPFC Planning Area (but in the Sacramento-San Joaquin Valley), and lands outside the Sacramento-San Joaquin Valley.

In support of meeting SB 5 requirements, the Sacramento Area Flood Control Agency (SAFCA) released its Final Urban Level of Flood Protection Plan and Adequate Progress Baseline Report in June 2016 and draft Comprehensive Flood Risk Reduction Program reduction in March 2017, outlining the agency's three-phase efforts to achieve at least 200-year flood protection for the Sacramento region. SAFCA is now starting its third phase to provide 500-year protection, which includes increasing conveyance downstream from Folsom Dam, investigating additional flood storage in reservoirs above Folsom, and implementing comprehensive system wide levee operations, maintenance, repair, replacement, and rehabilitation measures. In addition, the City of Sacramento developed a Comprehensive Flood Management Plan in

2016, which builds upon floodplain conservation and land use measures included in the City's general plan and floodplain management ordinance, as well as other emergency planning documents prepared by the land use agencies. Sacramento County adopted amendments to its General Plans and Zoning Codes in October 2016 to establish a 200-year flood standard of protection in urban areas. The amendments included policies to address regional agency coordination, setbacks along levees, elevation and construction standards, flood-related map data, flood emergency response, floodway management, and building design standards. In addition, Sacramento County also adopted a Floodplain Management Ordinance in January 2017.

The Folsom Dam Joint Federal Project was completed in 2017. This project was overseen by Reclamation and the U.S. Army Corps of Engineers (USACE) to construct an auxiliary spillway for Folsom Dam in order to increase the flood protection capacity to a 200-year level. The completion of this project aims at reducing floods, earthquakes, and seepage. Although the project has been completed, a Water Control Manual that allows the utilization of the new spillway capacity has yet to be finalized. Given the status of the Water Control Manual and ongoing levee improvements on the American River and other systems, Sacramento will remain susceptible to 100-year floods until the levee improvements along the American River are finalized and the Water Control Manual is completed over the next couple of months.

5.6.4.2. FM2. Improve Level of Flood Protection for Levee-Protected Small Communities and Agricultural Lands in the Region, Where Feasible

Sizable portions of the Region are devoted to agricultural land uses (see **Section 2.5**). In 2015, agricultural production in Sacramento, Placer, and El Dorado counties totaled nearly $580 million, contributing to the local and state economies, and providing food and fiber for worldwide consumption (California Department of Food and Agriculture 2016).

The continued viability of small communities is essential to the preservation of cultural and historical continuity and important social, economic, and public services to rural-agricultural populations, agricultural enterprises, and commercial operations. However, physical conditions of the levees and other flood management facilities in the Region are varied.

This strategy recognizes that (1) small communities and rural-agricultural areas will not be required to provide urban level of flood protection (as the name implies), (2) agencies with flood management and/or land-use responsibilities in the Region will need to work together and with state and federal agencies to reduce flood risks in small communities and rural-agricultural areas, (3) there will likely be different ways to reduce these flood risks (both structural and nonstructural improvements), (4) current and future federal engineering guidance and design standards may make levee repairs cost-prohibitive, and (5) flood risk

reduction projects that can achieve multiple resource benefits will likely be preferable to single-purpose projects and may provide greater long-term value.

5.6.4.3. FM3. Promote Restoration and Conservation of Floodplain Function

Floodplain restoration is the process of recovering the natural hydrologic, geomorphic, and biological functions and resources of an area adjacent to a stream or river that experiences occasional or periodic flooding. Floodplain restoration is often accomplished by reconnecting the floodplain to the stream or river through the removal of physical or human-made barriers. Restoring floodplains includes the attenuation of flows downstream from the restored floodplain and enhancement of floodway capacities, the promotion of diverse habitats for aquatic and terrestrial species, the improvement of water quality, and the increased recharge of groundwater. Floodplains also support agricultural production, recreational opportunities, and scientific study and education. Floodplain restoration also reduces the potential for increased flood risks and damages over time associated with unwise commercial or residential development within floodplains.

In the Region, floodplains provide a broad area to spread out and temporarily store floodwaters. This attenuates flood peaks and reduces velocities and the potential for erosion. The natural and beneficial functions of floodplains should be valued and considered in future integrated water management projects and programs. Examples of ongoing floodplain restoration efforts in the Region include those in the Lower Cosumnes River Floodplain, Lower Dry Creek Floodplain, North Laguna Creek Watershed, and Cross Canal Watershed.

Across California, emerging practices are restoring riparian zone functions through floodplain inundation and recharge, which can improve flood protection and water supply resilience. Stormwater capture and use projects support improved floodplain function at both small- and large-scales. In the urbanized watersheds of the Region, linking stormwater capture and floodplain restoration can provide important localized habitat and recreational opportunities through much of the year, while also potentially contributing to flood protection during some storm events. Alternatively, regional planners can use stormwater capture and use in floodplain restoration projects for purposes of reducing contaminant loading in the restored areas, making new habitat more amenable to aquatic species.

Conservation is included here as a means of emphasizing the need to restrict development into existing, functioning floodplains.

5.6.4.4. FM4. Support a Folsom Dam Water Control Manual Update that Balances Flood Control, Water, Environmental and Recreational Needs

Folsom Dam and Reservoir is a multipurpose project (flood risk management, water supply, hydroelectricity, water quality, fish and wildlife preservation, and recreation) operated by Reclamation as part of the CVP. The USACE is responsible for prescribing operations pertaining to use of the storage allocated for flood risk management. The dam provides flood risk management benefits to the City of Sacramento and its surrounding areas by regulating runoff from approximately 1,860 square miles of drainage area.

As discussed in **Section 5.6.4.1** the Folsom Dam Joint Federal Project consisted of construction of a new auxiliary spillway, completed in October 2017. The spillway will improve the ability of Folsom Dam to manage large flood events. To fully realize the benefits of the new auxiliary spillway, the current Folsom Dam and Reservoir Water Control Manual must be updated. The draft update to the Water Control Manual and the Folsom Dam Modification Project Water Control Manual Update Draft Supplemental Environmental Assessment/Environmental Impact Report (SEA/EIR) were released in June 2017. The Draft SEA/EIR identifies two action alternatives and evaluates the effects of those alternatives on Folsom Dam and the Reservoir's authorized purposes.

The purpose of the ongoing update effort is to identify, evaluate, and recommend changes to the flood management operation rules of Folsom Dam and Reservoir that would reduce flood risk to the Sacramento area by using the new auxiliary spillway and by incorporating an improved understanding of the American River watershed upstream from Folsom Dam. The findings of the evaluation will be used to help define the dam's new flood operations plan, with the intention of meeting flood risk management objectives in a manner that conserves as much water as possible and maximizes all authorized Folsom Dam project uses to the extent practicable.

This strategy recognizes that (1) proposed alternatives identified in the SEA/EIR could have significant effects on the other authorized purposes of the project, and (2) a balanced manual update will be critical to achieving the ARB IRWMP goals. As of this writing, the USACE is finalizing a revised WCM that is balanced and incorporates forecast based operations.

5.6.4.5. FM5. Coordinate with Inter-Jurisdictional, Regional Flood Management Efforts

Developing and implementing integrated, multi-benefit projects often involves (1) a large number of local, regional, state, and federal agencies with complex and overlapping jurisdictional roles and responsibilities, inconsistent policies and regulations, and multiple management goals, and (2) a continual investment in stakeholder and public education and engagement. Projects with a flood management component often have

effects both upstream and downstream, further expanding the geographic scope of the coordination effort. Flood management functions within a single geographic area may be carried out by a combination of city and county planning and public works departments, drainage districts, water supply districts, joint powers authorities, and others. Coordinating activities within this fragmented jurisdictional landscape can be challenging and costly, particularly for local entities.

Participating agencies in the Region were involved in development of the Lower Sacramento & Delta North Regional Flood Management Plan (RFMP) effort, described in **Section 2.7**. The final RFMP, delivered to DWR in July 2014, established the flood management vision for the Region and identified regional solutions to flood management problems at a prefeasibility level. The RFMP identified 116 regional flood improvement projects and 15 conservation opportunities ready for integration with recommended single-purpose flood projects. Structural and nonstructural improvements were recommended to achieve a 200-year level of protection in urban and urbanizing areas in the Region. Some of the outcomes of this regional plan will be reflected in the ARB IRWMP projects database as well as in future updates of this plan.

Outside the geographic scope of the Lower Sacramento & North Delta RFMP effort, RWA as the RWMG, participants in the Governance Structure, and project proponents have a long history of coordinating across geographic and jurisdictional boundaries in support of effective flood management and land-use planning.

5.6.4.6. FM6. Coordinate Flood Emergency Planning and Response Efforts

Flood emergency planning and response is an element of residual risk management. It involves preparing for floods, effectively responding to flood events, and quickly recovering when flooding occurs. Often the first responders, local agencies play a key role in the management of flood emergencies in their jurisdictions. However, coordinated flood planning and operations among local agencies, cities and counties, the California Emergency Management Agency, the State-Federal Flood Operation Center, and USACE are critically important in successfully managing and fighting floods, and saving lives and properties.

California Water Code Section 9621 required that each county in the Sacramento-San Joaquin Valley collaborate with cities within its jurisdiction to develop a flood emergency plan within 24 months of the adoption of the CVFPP. In addition, to qualify for Federal Emergency Management Agency (FEMA) disaster funds, local agencies are required to prepare a Multi-Hazard Mitigation Plan, called an Emergency Action Plan, which includes planning for all potential emergencies in their jurisdictions, including flood emergencies.

This strategy recognizes that (1) without proper planning, interagency coordination during a flood emergency can be disorganized and inefficient, (2) conflicting policies amongst agencies can lead to delayed response and recovery activities, and (3) in many cases, local agencies do not have sufficient resources to effectively prepare for and respond to major floods (DWR 2012c).

5.6.5. ARB Community Stewardship Strategies

5.6.5.1. CS1. Increase Availability and Access to Educational Material on Sustainable Water Resources

Widespread awareness of the need to manage water resources sustainably is critical to develop, select, and implement effectively integrated projects and programs. Education of both citizens and natural resources managers across jurisdictional lines and differing fields will help develop a stronger common vision and goals. A common understanding provides support for and promotes sustainable, integrated projects. Availability and access to educational materials is one method that supports continued education of citizens and resource managers alike.

Educational material could be public-friendly Web sites or fliers and brochures that could be distributed. Currently, RWA's WEP, for example, maintains a user-friendly Web site on water use efficiency and also provides educational classes. Be Water Smart (http://bewatersmart.info/) is an award-winning public outreach- and school-education focused program sponsored by the WEP. Watershed management groups and environmental organizations often incorporate outreach and education into their programs and associated efforts. Additionally, educational material such as informational signs could be placed near a project (e.g., a trail or a well site) with an explanation of how that water-related facility is a part of the larger water and sustainability picture and how it influences each citizen. Developing materials suitable for use directly in classrooms may also be important. ARB SWRP and West Slope SWRP projects also receive credit for increasing public education related to stormwater. This may include educating residents on best practices for yard and waste disposal, providing public signs that illustrate habitat restoration projects, and providing accessible materials showing how LID changes urban runoff patterns. Currently, the RWA members are supporting the Power House Museum which will provide opportunities to the public to engage and learn about space exploration, nature and specifically water.

5.6.5.2. CS2. Identify, Summarize, and Discuss the Potential for Partnering of Existing Regional Outreach and Education Programs by 2021

Working to leverage existing regional outreach and educational programs in the Region is a strategy focused on encouraging community stewardship of water and natural resources among citizens in the Region. These efforts include those being undertaken by local and regional water entities, as well as other local, state, federal, and non-government organizations that promote outreach to disadvantaged citizens, and public

water education. This can include public events, including Earth Day and Creek Week, volunteer clean up initiatives of local waterways, classroom presentations, and regional water efficiency programs.

By cataloguing and tracking existing regional outreach and education programs in the community, the Region can find and leverage relationships between community-based organizations, the local water community, elected officials, and media organizations. For instance, through this IRWMP's Opti Web site's announcements and calendar, regional entities can communicate and collaborate on upcoming events and programs. RWA updated its Strategic Plan in late 2017 and continues to implement the Plan and adopt modifications, as needed.

Every public participation effort in the Region strengthens the relationship of the community to water resources, and builds upon existing partnerships in the Region. Regional water agencies and other organizations looking to reach out to citizens can maximize their impact and effectiveness by partnering and sharing local knowledge, expertise, and resources. The benefits of an engaged and educated community include better planning in communities, more diverse and meaningful public participation, and building better connections between people and the planet.

5.6.5.3. CS3. Identify Natural Recharge Areas and Relay that Information to Relevant Land-use Planning Agencies by 2022, Encouraging the Preservation of Recharge Areas

Protecting natural groundwater recharge areas to facilitate and promote groundwater infiltration is important to maintain and protect groundwater levels and groundwater quality. Working with willing landowners to protect identified recharge sites via conservation easements or acquisition strategies creates opportunities for multi-benefit projects that recharge groundwater and preserve habitat and agricultural lands. Detailed mapping of the eastern portion of South American Subbasin and Cosumnes Subbasin regions has been accomplished and is available to guide project selection. Various infiltration investigations have occurred in the past, and water agencies can continue to study and identify the areas with soil/ground characteristics in their respective service areas that promote infiltration. However, only agencies with land-use planning authority (cities and counties) have the ability to make land decisions with respect to zoning. This strategy specifically addresses the need for broader knowledge on the issue of regional groundwater infiltration and sets a deadline for communicating with land-use planning agencies about identified recharge areas. Efforts may continue thereafter to develop a common understanding with land-use planning agencies and to ensure the areas' protection into the future. In addition, regional participating agencies recognize the importance of regional coordination between land-use planning agencies and local GSAs to ensure that land decisions are contributing toward meeting GSP and basin sustainability goals.

5.6.5.4. CS4. Promote the Use of Low Impact Development Methods, Where Appropriate

According to the EPA, LID is "an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible" (2013). LID could involve preserving landscape features, minimizing impervious areas, and onsite capturing rainwater/stormwater for later reuse or groundwater infiltration. Effective decentralized stormwater management delays and attenuates peaks of high water flows and improves water quality. This in turn protects receiving water quality and ecosystem habitats from degradation.

A review of other regions implementing LID suggests that water managers, stormwater agencies, and land-use agencies need to work together well before attempting to implement a LID program. This strategy, therefore, intends to increase communications and to support manuals, zoning, and other regulations that would support LID. Education and support for these practices could become a part of water efficiency outreach.

In addition, many of the region's future stormwater investments will include LID. LID strategies can help create or enhance public space while also improving water quality. In addition, implementing on-site LID strategies requires public engagement, especially with developers, neighborhoods, and businesses, which are all responsible for meeting on-site drainage requirements. Other parts of California have gone as far as to require minimum on-site retention, often through LID, in pursuit of meeting stormwater quality permits. For the Region, using well-designed LID strategies, especially in urban areas, can have multi-sector benefits for both environmental systems and public spaces.

5.6.5.5. CS5. Provide Annual Updates to City and County Governments and Other Local Agencies on Accomplishments and Continued Challenges of Integrated Water Management

The various discussions that took place in developing the Region goals, objectives, and strategies attested to the increasingly integrated nature of water and land resources as well as economics and people. The Region recognizes that water management is getting more complex and thus more discussion across traditionally separate disciplines is imperative for understanding and eventual success in integrated water resources management. Dialogue must continue and increase in frequency into the future. This strategy, therefore, delineates that city and county governments will be provided with updates of integrated water management efforts yearly. This communication will lead to greater understanding and better integration of local/regional efforts in water management.

5.6.5.6. CS6. Increase Engagement of Community Leaders (e.g., Using Community-Based Social Marketing Where Applicable)

Increasing the effectiveness of engagement to community leaders is critical to the future of the Region. Elected officials, representatives of disadvantaged communities, and the business community all have a stake in the success and overall health of the Region. By reaching out to these community leaders and inviting them to participate in the planning process and stakeholder forums, leaders and the organizations they represent can help build and sustain regional knowledge and skills, recruit for volunteer efforts, networks, and partnerships that contribute to promote the health and sustainability of natural resources.

Community-based social marketing can be described as a strategy that can help motivate communities, businesses, individuals, and institutions to foster behaviors that support sustainability. This could include reducing lawn watering, promoting safe disposal of household contaminants, or backyard composting. Social marketing retains the focus on customers that is the center of the more commonly known "commercial marketing," but differs in that the tools and concepts promote social goals (like the triple bottom line). Actions can include but are not limited to; print and radio advertisements, e-mail distributions and online content. Engaging community leaders effectively is imperative to effectively working with the customers and communities that the Region would like to engage in these programs that promote community stewardship.

5.6.5.7. CS7. Increase Engagement of Agricultural Stakeholders and Private Water Users

The California Water Plan (CWP) defines "agricultural land stewardship" as farm and ranch landowners — the stewards of the state's agricultural land — producing public environmental benefits in conjunction with the food and fiber they have historically provided while keeping land in private ownership. Historically, agricultural operations have been important to the economic vitality of the Region. Southern portions of Sacramento County and western Placer County have strong agricultural interests and associated private water use. However, economic markets and technological advancements have impacted agricultural markets and farming practices in the Region, leading to a steady decrease in acreage of agricultural and grazing lands. Conversion of agricultural lands to other uses may impact the Region's ability to provide ecosystem services to the public. Agricultural landscapes may also provide flood management, water storage, carbon sequestration, and other key services. The Region recognizes the important role that agricultural land plays in integrated water management. Engaging agricultural and private water users is important to achieving the goals identified in this IRWMP.

Leveraging existing programs and communication channels can be an effective way of engaging agricultural and private water users without causing "stakeholder fatigue." For example, SGMA requires

local GSAs to conduct a public outreach process and engage beneficial users of groundwater, including agricultural and domestic well owners. Outreach conducted by GSAs to local agricultural stakeholders and private water users can include additional information related to broader integrated water management practices. Other outreach and engagement channels may include the Irrigated Lands Regulatory Program, CV-SALTS, county Farm Bureaus, and prominent local agricultural associations and organizations. The Region will also seek opportunities to coordinate agricultural and urban water suppliers to more effectively address water management and land use planning issues.

Existing agricultural stewardship efforts in the Region include the Placer Legacy (a county-wide open space and habitat protection program), Cosumnes River Preserve, and the Sacramento Valley Conservancy. The SSHCP, completed in May 2018, is a regional approach to addressing issues related to urban development, habitat conservation, and agricultural protection. The SSHCP consolidates environmental efforts to protect and enhance wetlands (primarily vernal pools) and upland habitats to provide ecologically viable conservation areas. SSHCP was collaboratively developed by the County of Sacramento, City of Rancho Cordova, City of Galt, Sacramento County Water Agency, SRCSD, and the Capital Southeast Connector Joint Powers Authority.

5.6.6. ARB Parking Lot Strategies

Development of the ARB IRWMP strategies was an iterative process. During the 2013 ARB IRWMP Update process, the Planning Forum members (ARB stakeholders) thought some of the proposed strategies involved important ideas and concepts, but could not be developed at that time. The reasons included lack of authority over the particular area of water management or a lack of information available to form a strategy. Additionally, some stakeholders proposed new strategies following the public review draft release of the ARB IRWMP. Developing strategies were placed in a "Parking Lot."

All Parking Lot strategies outlined in the 2013 ARB IRWMP Update were assessed by RWA and the Planning Forum for inclusion in the 2018 ARB IRWMP Update. Some Parking Lot Strategies were incorporated into existing objectives and strategies, or fully developed into new strategies. Others were removed, because they were determined to no longer be a focus for the Region, or new regulatory requirements were implemented since the Parking Lot item was first identified. Still others were modified to reflect changed conditions or regional priorities. The 2018 ARB IRWMP Update Parking Lot Strategies are described in **Table 5.6.**

Table 5-6. ARB IRWMP Strategy "Parking Lot"

Item	Description
1. WR: Non-revenue water reduction	Non-revenue water is defined by the American Water Works Association as the "distributed volume of water that is not reflected in customer billings" (2013). Non-revenue water generally falls into one of these three categories: unbilled authorized consumption (water used for firefighting, hydrant flushing, etc.), apparent losses (meter inaccuracies, data handling errors, etc.) and real losses (system leakage, storage tank overflows, etc.). SB 1420, passed in 2014, requires all urban water suppliers to submit water loss audits with their UWMPs to DWR every five years. Chaptered in October 2015, SB 555 requires all urban retail water suppliers to annually submit a completed and validated water loss audit to DWR, beginning in October 2017. As part of this process, DWR established water loss audit and validation standards. The State Water Board is currently developing water loss performance standards for urban retail water suppliers. These standards are anticipated to be finalized by January 2020. The standards will incorporate local and operational conditions to determine economically achievable water loss reduction for each urban water retail supplier. ARB water suppliers have been investigating strategies and pratices to reduce non-revenue water associated with apparanent and real losses since 2013. A strategy to evaluate the Region's success towards meeting the state's water loss standards, once finalized, will be explored.
2. WR: Regional data management system for water supply systems	The ARB water supply agencies recognize that water supply infrastructure and efficiencies can be improved region-wide only with support from adequate and consistent data collection and analyses across various entities. Such a data management system would be integral also to implementing an efficient and effective conjunctive use program. As meters are installed throughout the Region, this system would additionally help determine the effect of new rate structures on the long-term stability of the entire water supply system. As part of SGMA, local GSAs in each basin are required to develop and maintain a coordinated data management system for the basin. This data management system must be capable of storing and reporting information relevant to the development and implementation of its GSP(s) and monitoring of the basin's sustainability. While focused on groundwater, these coordinated SGMA data management systems may serve as the basis for a future regional data management system.
3. WR: Peak demand reduction	Peak demand is the highest water use experienced by a water supply system, measured on an hourly, daily, monthly, or annual basis (Vickers 2001). Reducing peak demand is one way a water agency can decrease operational cost; reduce energy, chemical, and water use; and increase supply reliability. It also allows agencies to focus more on replacement and rehabilitation of aging infrastructure rather than expand or build new infrastructure, which would require future investments in operations and maintenance (O&M). The ARB water agencies may consider and develop this strategy as both O&M costs and the need to refurbish existing infrastructure increases.
4. (N/A): Quantification of certain strategies	The Region recognizes that quantifiable, measurable strategies are important whenever possible, so the Region can objectively measure progress during implementation. Some of the above strategies are qualitative at the time of the adoption of this IRWMP out of necessity (the strategy is not quantifyable) or out of lack of experience. In the latter case, numeric targets will be developed as experience is gained and is anticipated in the next update of strategies.

Key:
ARB = American River Basin
DWR = California Department of Water Resources
GSA = groundwater sustainability agency
GSP = groundwater sustainability plan
IRWMP = Integrated Regional Water Management Plan
O&M = operations and maintenance
SB = Senate Bill
SGMA = Sustainable Groundwater Management Act
UWMP = Urban Water Management Plan

5.6.7. California Water Plan Resource Management Strategies and ARB Strategies

To assist IRWM regions meet their water-related resource management needs, the CWP outlines a diverse set of resource management strategies (RMS). An RMS is "a project, program, or policy that helps local agencies and governments manage their water and related resources" (DWR 2009). RMS are treated as tools in a tool kit-the appropriate combination of tools should be used in each region, depending on that region's needs and circumstances.

Regional stakeholders used the CWP 2013 Update RMS to inform the collaborative development of Region specific strategies. **Table 5-7** presents RMS per topic area and its applicability to the Region for the Region's current set of strategies. There are a few new RMS expected for the 2018 update of the CWP. They are presented at the end of **Table 5-7**.

Table 5-7. CWP Resource Management Strategies and Applicability in the Region

CWP RMS	Applicability	Description	Applicable ARB Strategies
RMS Topic: Reduce Water Demand			
Agricultural Water Use Efficiency	Applicable	Private agriculture can be found throughout the state, especially in undeveloped areas of western Placer County and southern Sacramento County. Outreach to these individuals and entities is important to encourage participation in regional planning.	Strategy CS8
Urban Water Use Efficiency	Applicable	Water conservation is an important component of demand management in the Region. RWA has a Water Efficiency Program targeting the public, and individual water suppliers implement other conservation programs, such as BMPs established by the CUWCC. State law requires decreasing urban per capita water use by 20 percent by year 2020 (see **Section 2.9.1**). In addition, the State Water Board is currently in the process of adopting and implementing permanent water conservation regulations for monthly reporting and permanent prohibitions of wasteful water practices.	Strategy WR6, CS1, CS2

Table 5-7. CWP Resource Management Strategies and Applicability to the Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
RMS Topic: Improve Operational Efficiency and Transfers			
Conveyance – Delta	Not Applicable	The Region is not dependent on water conveyed through the Delta. As described in Section 2.3, The Region does have a point of diversion within the legal Delta, but the Region does not rely on Delta-conveyance for its supply.	N/A
Conveyance – Regional/Local	Applicable	Numerous water agencies share water treatment and distribution infrastructure. Maintenance of old systems, construction of new capacities, and improvements in connections between water systems are important in the Region for efficiency, planned growth, and water reliability in dry years.	Strategy WR1, WR2, WR3, WR4. WR8
System Reoperation	Applicable	System operational efficiency is important for water agencies. New infrastructure will provide additional opportunities for increased operational flexibility. Folsom Dam operations are not under local or regional control, but agencies and stakeholders in the Region have actively participated in the dam's water control manual update.	Strategies WR4, FM4
Water Transfers	Applicable	Local water transfer agreements have been signed within the Region following the WFA. For example, some agencies with access to groundwater have agreed to share portions of their dry year surface water allocation to those without groundwater supplies. The Region is currently working on developing a Water Marketing Strategy and Conjunctive Use Framework for the ARB to facilitate and expand future water transfer opportunities to provide water both within and outside the Region. In 2018, consistent with these efforts, a number of agencies in the ARB collaborated on a regional groundwater substitution transfer.	Strategy WR2, WR8

Table 5-7. CWP Resource Management Strategies and Applicability to the Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
RMS Topic: Increase Water Supply			
Conjunctive Management and Groundwater Storage	Applicable	One of the main efforts following the WFA was a regional conjunctive use program to effectively store water supplies underground for use in dry years. Conjunctive improvements continue to be constructed. The potential to use additional recycled water supplies supporting further conjunctive use will be studied in the near future. Groundwater management in the Region will be the responsibility of locally-formed GSAs. Implementation actions identified in GSPs and alternative plans may include conjunctive use and actions to increase groundwater recharge.	Strategy WR2, WR5, WQ5, WR7, WR8
Desalination	Not Applicable	The Region currently does not use, nor plan to use, desalinated water.	N/A
Precipitation Enhancement	Not Applicable	Precipitation enhancement is not performed nor is it practical within the Region. However, Sacramento Municipal Utility District has had a cloud-seeding program since 1968 in the upper watersheds of the American River. Pacific Gas and Electric Company has also had similar programs in the Sacramento River watershed. Being downstream from these areas, the Region would be affected by any benefits (increased water supply and power) and impacts from these programs.	N/A
Municipal Recycled Water	Applicable	Several water agencies currently produce and use recycled water for irrigation purposes. The Region expects increased recycled water production due to NPDES permit changes and is engaged in facilitating additional distribution system capacity for increased use regionally.	Strategy WR5, WQ7, WR9
Surface Storage – CALFED/State	Not Applicable	Shasta Lake influences Sacramento River flows as well as operation of other CVP facilities, including Folsom Dam. However, the Region does not expect CALFED projects to materially affect water supply availability or quality in the Region.	N/A
Surface Storage – Regional/Local	Applicable	Although not located within the Region, a few agencies in the Region are providing financial contributions to and participating in the Sites Project Authority. A new Sites Reservoir could favorably affect water supply availability and reliability in the Region, particularly if it could be integrated with the Region's efforts to expand conjunctive use operations.	Strategy WR8

Table 5-7. CWP Resource Management Strategies and Applicability to the Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
RMS Topic: Improve Water Quality			
Drinking Water Treatment and Distribution	Applicable	Water treatment and distribution are established practices for protecting public health. Water supply agencies have ongoing projects and programs to ensure safe and adequate drinking water.	Strategies WR1, WR2, WR3
Groundwater Remediation/ Aquifer Remediation	Applicable	Groundwater contamination plumes are a significant threat to groundwater supplies in the Region. Containing, remediating, and finding appropriate uses for remediated groundwater is an ongoing effort.	Strategies WQ5, WQ6
Matching Quality to Use	Applicable	Using recycled water and remediated water for nonpotable uses can offset traditional potable water demands. Both water sources are produced and reused in the Region.	Strategies WR5, WQ6
Pollution Prevention	Applicable	The Region recognizes the importance of managing source water pollution, especially as TMDLs and salt and nutrient management become increasingly central issues. One strategy directly addresses source pollution prevention. Stormwater agencies, such as the Sacramento Stormwater Quality Partnership, provide outreach and education to the public to encourage water quality protection. The ARB SWRP and West Slope SWRP further seek to identify potential strategies and projects for addressing stormwater pollution.	Strategy WQ3
Salt and Salinity Management	Applicable	Salt and salinity management is important for water management agencies across the Region. SRCSD is an executive committee member of the CV-SALTS program, and one ARB strategy focuses on the need to leverage this opportunity and identify regional salt and nutrient issues. SGA is planning a study of salt and nitrate trends in its groundwater basin. Recycled water producers anticipate developing salt and nutrient management plans in the near future.	Strategies WQ1, WQ2, WQ3, WQ7
Urban Stormwater Runoff Management	Applicable	Urban runoff management is important to manage local flooding and to protect water quality in receiving waters. Municipalities in the Region manage runoff and have developed SWRPs, which are incorporated as part of this IRWMP. One ARB strategy promotes LID, and another encourages runoff infiltration and reuse.	Strategies WR9, WQ4, CS4

Table 5-7. CWP Resource Management Strategies and Applicability to the Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
RMS Topic: Improve Flood Management			
Flood Management	Applicable	Significant portions of the City of Sacramento and other nearby low-lying areas or stream corridors are within FEMA-designated floodplains. Improving flood management is a priority within the Region. Current projects involve both infrastructure improvements/construction as well as conservation easements/ floodplain property acquisitions. SAFCA is working on a three-phase effort to achieve at least 200-year level of flood protection in the Sacramento region. Six ARB strategies address regional flood concerns.	Strategies FM1, FM2, FM3, FM4, FM5, FM6
RMS Topic: Proactive Resources Stewardship			
Agricultural Lands Stewardship	Applicable	Open/agricultural land conservation is important socially and economically in the Region. Land-use agencies carefully consider agricultural land preservation to balance urban development rates. The Placer Legacy is a county-wide open space and habitat protection program. Sacramento County and its partners, finished the South Sacramento Habitat Conservation Plan in May 2018. The Sacramento Valley Conservancy is also active in land stewardship along the Cosumnes River and Sacramento Region.	Strategies ER2, ER3, ER4, CS8
Ecosystem Restoration	Applicable	Since the WFA, water management issues in the Region have been intricately linked with environmental interests and needs. Discussion continues for establishing minimum flow requirements on the lower American River and creating strategies to provide flows for anadromous fish passage on the Cosumnes River, impacted by groundwater overdraft. Numerous watershed organizations are active in this Region. Land preservation and stewardship are important in western Placer County and southern Sacramento County as well.	Strategies ER1, ER2, ER3, ER4, ER5, ER6, ER7, FM4
Forest Management	Not Applicable	While some portions of the Region are forested, most of the upstream forested areas lie within the neighboring CABY IRWM Region.	N/A
Land-Use Planning and Management	Applicable	Land-use planning is inextricably tied to water resources planning. Some water agencies (cities and counties) have land-use authority, and Sacramento and Placer counties have policies and practices that limit urban development relying strictly on groundwater use. Water managers work closely with land-use managers on floodplain issues and evaluating lands for use in meeting ecosystem goals.	Strategies CS3, CS4, CS5, CS6

Table 5-7. CWP Resource Management Strategies and Applicability to the Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
Recharge Area Protection	Applicable	The surface of the Region is overlaid by various improved (paved) and unimproved surfaces including rural lands, and open space. Numerous projects have studied the effectiveness of protecting known groundwater recharge areas, and mapping the region's sand and gravel areas has been completed. The Region developed a strategy to identify natural recharge areas and to notify land-use agencies of recharge protection. Additional measures and projects to enhance or protect recharge areas are included in the ARB SWRP and West Slope SWRP.	Strategy CS3
Sediment Management	Applicable	Sediment management is of particular concern in stormwater and flood management as well as a water quality concern in smaller streams. Stormwater management plans and ecosystem or watershed plans throughout the Region include actions on sediment management.	Strategies WR9, WQ3, ER7, FM4, CS4
Watershed Management	Applicable	The IRWM planning process promotes integrated watershed management that crosses jurisdictional and political boundaries. The Region also encompasses numerous smaller watersheds, some of which have established watershed management groups. Collaborative watershed management will continue to gain importance in the Region, in line with water quality, flood, and ecosystem priorities.	Strategies WQ2, WQ3, ER3, ER7, FM4, FM5, CS4
RMS Topic: People and Water			
Economic Incentives (Loans, Grants, and Water Pricing)	Applicable	Economic incentives influence water management in the Region. Regional agencies, such as RWA and SAFCA, have been effective in securing grants and/or leveraging state or federal programs to plan and implement projects and programs. Water and power agencies, in turn, have established and continue to improve economic incentives for their customers to promote water conservation. For example, RWA's WEP includes a rebate program to encourage consumers to purchase water efficient appliances.	Strategy WR6
Outreach and Education	Applicable	Community Stewardship is one of five identified goals in the Region. This goal includes both outreach and education of the public as well as better communication and integration among the various water resources managers.	Strategies CS1, CS2, CS4, CS5, CS6

Table 5-7. CWP Resource Management Strategies and Applicability to the Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
Water and Culture	Applicable	Infrastructure history, such as the building of Folsom Dam as a part of the CVP, has cultural significance in the Region. The Sacramento region originally developed as a regional hub in part because of proximity to water transportation; this history is preserved in Old Town Sacramento. The relative abundance of water regionally was also important to Native American tribes that relied on local water supplies.	Strategies CS1, CS5, CS6
Water-Dependent Recreation	Applicable	The Region enjoys vast opportunities for water-dependent recreation and has purposefully designated certain lands for recreation. For example: the American River Parkway and recreation (boating, camping) at Folsom Lake. Integrating recreation and public access into project and ecosystem management allows the public to enjoy open spaces. It can also provide education to the public about the Region's water supply and ecosystem. Multiple projects and programs for the Region include recreation and public access elements.	Strategies ER7, CS1
RMS Topic: Other RMSs			
Crop Idling for Water Transfers	Not Applicable	The Region does not currently recognize the need for crop idling for water transfers.	N/A
Dew-vaporation or Atmospheric Pressure Desalination	Not Applicable	The Region does not currently recognize a need for any form of desalination for water supply.	N/A
Fog Collection	Not Applicable	The Region does not currently recognize a need for fog collection for water supply.	N/A
Irrigated Land Retirement	Not Applicable	Irrigated land retirement occurs through market based, economic forces and through land-use planning actions. The Region does not currently recognize a need for forced retirement of irrigated land for water supply.	N/A
Rain-fed Agriculture	Not Applicable	Crops that receive their full water supply from rainfall are generally economically impractical in the Region due to hot summers and the lack of significant rainfall in the summer and fall months.	N/A
Snow fences	Not applicable	This strategy is considered impractical in the Region, as the Region does not typically receive enough snow mass to require the use of snow fences.	N/A
Waterbag Transport/Storage Technology	Not Applicable	This strategy is considered impractical in the Region, and would require coastal infrastructure to divert, onload, transport, and offload the waterbags.	N/A

Table 5-7. CWP Resource Management Strategies and Applicability to the Region (contd.)

Key:
ARB = American River Basin
CABY = Cosumnes, American, Bear, and Yuba
CALFED = California Federal Bay-Delta Program
CUWCC = California Urban Water Conservation Council
CVP = Central Valley Project
CV-SALTS = Central Valley Salinity Alternatives for Long-Term Sustainability
CWP = California Water Plan
Delta = Sacramento-San Joaquin River Delta
FEMA = Federal Emergency Management Agency
GSA = Groundwater Sustainability Agency
GSP = Groundwater Sustainability Plan
IRWM = Integrated Regional Water Management
IRWMP = Integrated Regional Water Management Plan
LID = low impact development
NPDES = National Pollutant Discharge Elimination System
OCAP = Operations Criteria Plan
Region = American River Basin Region
RMS = Resources Management Strategies
RWA = Regional Water Authority
SAFCA = Sacramento Area Flood Control Agency
SGA = Sacramento Groundwater Authority
SRCSD = Sacramento Regional County Sanitation District
State Water Board = California State Water Resources Control Board
SWRP = Storm Water Resource Plan
TMDL = total maximum daily load
WEP = Water Use Efficiency Program
WFA = Water Forum Agreement

5.6.8. ARB Strategies and Climate Change Adaptation

An assessment of regional climate change impacts, vulnerabilities, and adaptation measures was conducted as part of the 2013 ARB IRWMP Update. This assessment was completed in accordance with the *Climate Change Handbook for Regional Water Planning* (USEPA and DWR 2011). Extreme weather events and changing hydrologic conditions in the past several years have underscored the need for the Region to continue to evaluate, identify, and implement mitigation and adaption actions.

From 2012 through 2016, California experienced a historic drought. In late 2015, stored water in Folsom Reservoir reached historic lows, threatening the water supply to over one million people in the Region as the municipal intake from the Reservoir serving multiple agencies verged on inoperability. Water managers in the Region continue to have concerns over the potential of a growing imbalance between water demands and water supply due to a variety of factors, including population growth; increased regulatory requirements; changes in CVP operations; inadequate infrastructure; and lack of interagency planning necessary to address emerging climate change conditions, and increasingly intense and more frequent extreme events (droughts and floods).

The Region recognizes that the effects of a changing climate have introduced significant uncertainty in long-term water supply reliability. The NAB RDCP expanded upon the vulnerability assessment conducted in 2013 and identified additional adaptation actions and emergency response actions for that area. The RWA-led Regional Water Reliability Plan (RWRP) further identified potential coordinated and collaborative actions of the Region's water agencies, as well as opportunities to expand regional conjunctive use to bolster regional reliability and resiliency to future conditions.

The strategies identified in the 2013 ARB IRWMP Update were developed, in part, to address regional vulnerabilities to the effects of climate change. Information developed during the 2013 vulnerability assessment was used to inform development of the strategies. During the 2018 ARB IRWMP Update, the RWMG and Planning Forum assessed the IRWMP strategies for Region-specific adaptation and resiliency actions. Where appropriate, measures from the NAB RDCP, RWRP, CARB's AB 32 Scoping Plan, CWP 2013 Update (RMSs), and other documents were incorporated into the strategies. **Section 2.10** further describes the Region-specific adaptation actions. **Table 5-8** illustrates how the adaptation actions identified in Section 2 are addressed in the 2018 ARB IRWMP Update strategies.

Table 5-8. ARB Adaptation Actions and Applicable ARB Strategies

ARB Adaptation Action	Applicable ARB Strategies
Water demand reduction	WR5, WR6, WQ9, WQ6
Water supply system improvement	WR 1, WR2, WR3, WR 4, WR5, WR7, WR8, WR9
Integrated flood management	FM1, FM2, FM3, FM4, FM5, FM6, CS5
Ecosystem stewardship	ER1, ER2, ER3, ER4, ER5, ER6, ER7, ER8, FM3
Watershed stewardship	WQ1, WQ2, WQ3, WQ4, WQ7, ER1, ER2, ER4, ER6, ER7, ER8, FM4, CS1, CS2, CS3, CS4, CS5, CS6, CS7
Regional water transfers	WR4, WR8
New surface water diversions	WR1, WR4
Groundwater banking	WR2, WR3, WR8, WQ5, WQ6, ER8, CS3

5.7. Project Submission, Review, and Communication Process

The Region vision, goals, objectives, and strategies are implemented by projects or programs that are led by project proponents in the Region. The Region, therefore, has an interest in knowing the variety of potential projects and ideas in the Region and identifying projects that would be in the regional interest to help implement, should such an opportunity arise. The ARB project review process was developed with input from stakeholders, so that the process would be fair, understandable, and aligned with the Framework elements. This process was also approved by the Advisory Committee during the 2013 ARB IRWMP Update. This process is presented with descriptions of the project submission process, project review process, and communication process.

5.7.1. Project Submission Process

Successful IRWM planning and implementation requires the identification of, and collaboration on, projects of regional significance. This is intended to be a "living process" that continues after formal adoption of the IRWMP and project implementation. To support the process over the long term and to provide an easy-to-use tool for stakeholders to enter their projects and collaborate with other stakeholders, the ARB IRWMP developed a Web site to serve as an on-line planning tool and information center (also known as "Opti"), which is available at http://irwm.rmcwater.com/rwa/login.php. The Opti user guide is available by clicking on the help icon on the site. Opti was developed with a committee of stakeholders to ensure the functions were user friendly and that a project could be entered by stakeholders without extensive computer or engineering backgrounds while maintaining data integrity. One part of the Opti submission form is shown in **Figure 5-3**. A paper copy of the project input form is also available to stakeholders that are unable to use the Web site.

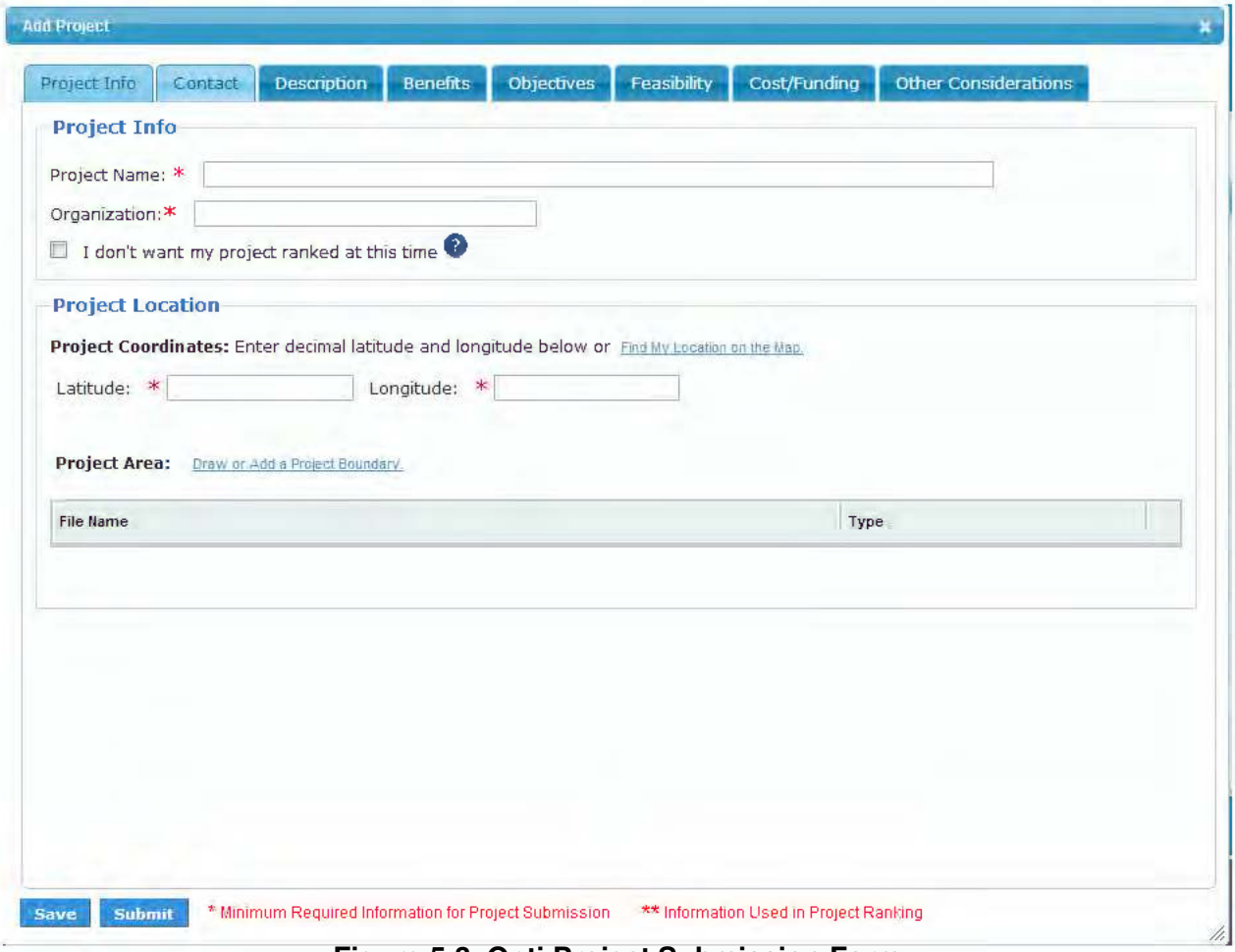

Figure 5-3. Opti Project Submission Form

Stakeholders are able to enter projects at any time during development and future implementation of the ARB IRWMP. By creating a user account at the site and requesting to become a member of the "community," stakeholders are able to add and edit their projects. While a stakeholder is entering their project information, they can share it with other community members of their choice that are also able to add information to the project. The project information can be saved, so that stakeholders are able to add their project information over multiple sessions. However, the entered project does not become visible to either the site administrator (RWA and its consultant) or the remainder of the ARB IRWMP community until the stakeholder selects the "submit" button.

Because the ARB IRWMP will pursue a diverse set of funding mechanisms well into the future, RWA encourages stakeholders to enter their projects into the system regardless of their current state of readiness. This will allow for greater collaboration and flexibility in shaping future projects. The ARB IRWMP allows for projects at various levels of completion, so only a subset of project information is required to enter a project into the Web site initially. There are two levels of required information as noted on the Web site. If a stakeholder only wishes to enter a project concept so that the community is aware of it, but does not want to have an initial project score assigned, very minimal information is required. However, until a project score is assigned (discussed in **Section 5.7.2**) and the project is vetted with stakeholders (**Section 5.7.3**), it cannot be considered as part of the ARB IRWMP. If a project score is requested by the stakeholder, additional information used to prioritize the project is collected on the Web site.

5.7.2. Project Review Process

RWA, as the RWMG, carefully considered DWR's 2016 IRWMP Guidelines in updating the process to review projects for inclusion into the ARB IRWMP. RWA was able to incorporate all of the review considerations (described below), with the exception of "whether the project proponent has adopted or will adopt the IRWM Plan." This is a funding criteria specific to the DWR IRWM Grant Program, and will only be applied if a specific grant proposal is developed in the future with this standard as a criteria. While RWA encourages others to consider adopting the ARB IRWMP, RWA will not require it of each individual stakeholder unless a specific funding mechanism requires it and that particular stakeholder is interested in pursuing the funding opportunity.

RWA interpreted that the DWR project review factors could be grouped into one of two categories: (1) factors related to the level of integration of a project, and (2) factors related to the implementability (or feasibility) of a project. The ARB project review process distinguishes these two project characteristics. In consultation with the 2013 ARB IRWMP Advisory Committee and following input from stakeholders, RWA devised an alpha-numeric ranking system that places projects into one of 16 categories based on the

project's level of alignment with regional priorities and implementability. This is shown graphically in **Figure 5-4**. Projects are assigned a regional priorities score of 1 through 4, where those with the highest level of alignment score a 1 and the lowest score a 4. Projects are also assigned a letter from A to D for an implementability score, with A being the most implementable or the most ready-to-proceed and D being the least implementable, or the least ready-to-proceed, at the time of scoring. A project with a score of 1A is considered to be of both the highest level of priority based on its level of alignment with regional priorities and the most ready-to-proceed based on its implementability score. A project score of 4D would be the least aligned and the least ready to proceed.

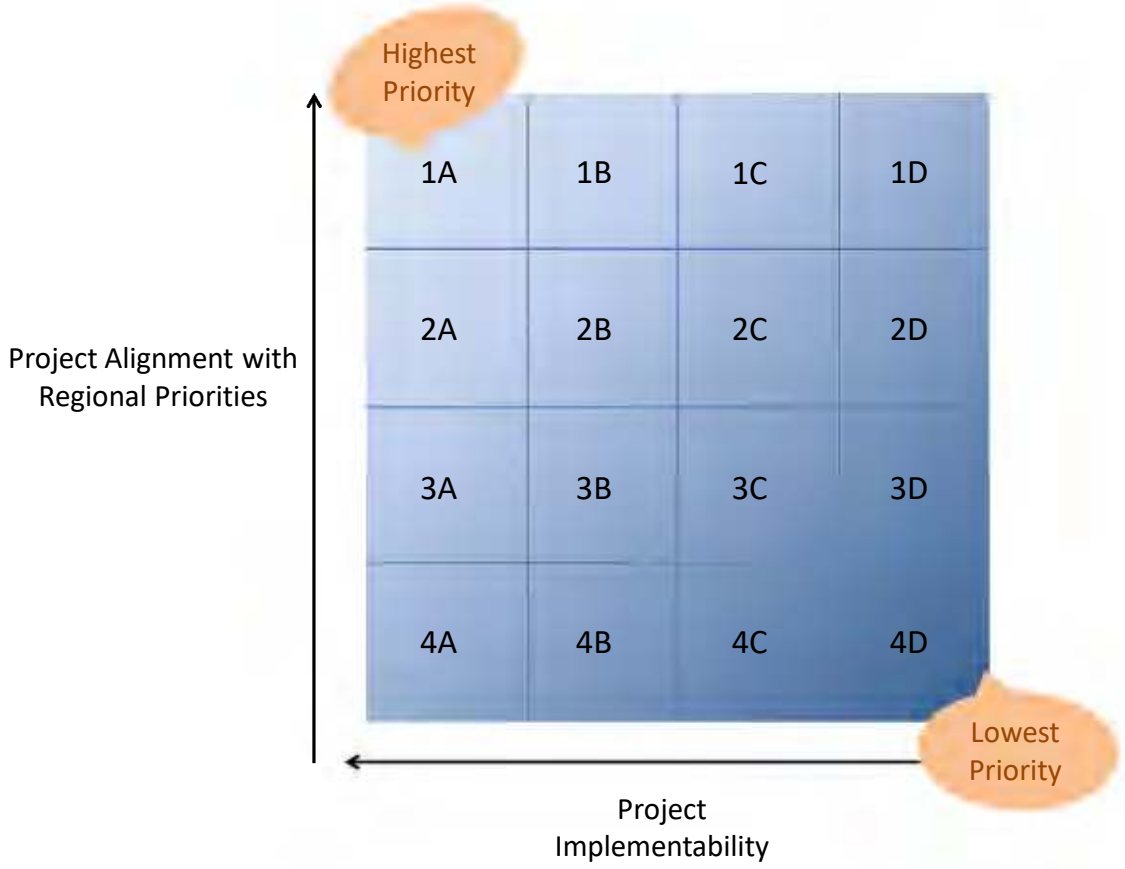

Figure 5-4. ARB Project Review Score Tiers

This method allows RWA to assign projects to tiers, rather than having to assign an absolute or relative ranking (e.g., Projects 1 through 150). This allows projects with different primary benefits (e.g., water supply, water quality, habitat, flood) to be on more level footing in being identified as a priority for the Region, which will help in promoting a diverse set of priority projects within the Region. This method also gives project proponents feedback on where the Region sees their projects in terms of priority and

implementability. Project proponents can then work on modifying their projects to increase alignment with regional priorities (e.g., bring in additional partners, find additional benefits) and update information on implementability to increase the readiness to proceed score in the future. The two categories of review factors and relative scoring are described below.

5.7.2.1. Project Alignment with Regional Priorities Score

This part of the scoring considers how a project provides benefits to the Region, according in part, to the goals and objectives identified by stakeholders. It also considers how integrated the project is with other regional stakeholders/agencies and their efforts as well as to DWR Guidelines. **Figure 5-5** shows an example project report card that assigns a score to a project that is a part of the ARB IRWMP.

Project Name:
Project Proponent:
Project Rank:

Regional Priorities Ranking	Possible Point Value	Points Awarded	Comments
Objectives (max 8 points)			
Meets 1	2		
Meets 2	4		
Meets 3	6		
Meets 4+	8		
Goals (max 1 point)			
Addresses more than one IRWMP goal	1		
Resources Management Strategies (max 1 point)			
Addresses more than one DWR Resource Management Strategy	1		
Strategic Considerations (max 3 points)			
1 Includes multiple partners	1		
2 Provides benefit beyond proponent	1		
3 Purposefully restructured for added benefit	1		
4 Necessary as a single-purpose, but considered integration opportunities	1		
5 Part of Water Forum Agreement implementation	1		
6 Implements other regional, collaborative plan	1		
Assists in climate change adaptation or reduces GHG emissions or energy consumption (max 1 point)	1		
Benefits to local disadvantaged community or tribal community (max 1 point)	1		
Total			

Regional Priorities Ranking Tiers

Tier 1 = 10 points or greater	Tier 3 = 6 to 7 points
Tier 2 = 8 to 9 points	Tier 4 = 5 points or less

Implementabilty Ranking	Possible Point Value	Points Awarded	Comments
Ready to commence within 2 years, if funding available	1		
Project Status section of Feasibility tab is complete	1		
Project Funding and Project Cost Breakdown sections of Cost/Funding tab are complete	1		
Benefits section of Benefits tab is complete with explanations	1		
Total			

Implementability Ranking Tiers

Tier A = 4 points	Tier C = 2 points
Tier B = 3 points	Tier D = 1 point

Comments

Figure 5-5. ARB Project Review Report Card Template

A total of 16 possible points can be awarded to a project based on the following criteria:

- **Number of ARB IRWMP Objectives Addressed**. The ARB IRWMP includes 18 adopted objectives. Because objectives represent the heart of the ARB IRWMP effort, these points account for a majority of the score. A project must address at least one objective to be included in the IRWMP. The objective scores are allocated as follows:

The project meets…	Points awarded:
1 objective	2
2 objectives	4
3 objectives	6
4 or more objectives	8

- **Number of ARB IRWMP Goals Addressed** – Projects that address more than one of the five adopted goals would receive a score of one point. This scoring criterion was added during the 2013 ARB IRWMP update at the request of the Advisory Committee, because they felt that it was relatively easy to address more than one objective with a project but more challenging to address more than one goal; those multi-purpose, integrated projects should receive a preference point in the scoring method.

- **DWR RMS** – Projects that implement more than one of the DWR RMSs will receive a score of one point. RMSs are listed on the Opti Web site and a link to DWR's explanation of each RMS is provided.

- **Strategic Considerations** – This criterion examines the level of integration a project achieves. Strategic Considerations represent an opportunity to address both DWR and local considerations. Because there were several ways in which a project proponent could receive a point with relative ease, this criterion is capped with a maximum of four points regardless of the number of considerations addressed. Points are eligible for addressing the following:

  - Project includes multiple partners
  - Project is single purpose, but is part of broader plan implementation[4]
  - Project provides benefits that extend beyond the project proponent and its immediate constituents
  - Project was purposefully restructured to provide additional benefit

[4] This factor acknowledges that there are projects that would appear to have little direct integration (e.g., groundwater public supply well), but are necessary as part of a broader regional strategy that will achieve integrated benefits (e.g., a groundwater public supply well that will help implement a conjunctive use program that dedicates water to environmental purposes in dry periods).

- Project can be demonstrated to be important part of implementation of the WFA or another regional or collaborative planning effort

- Project includes data collection that will be shared with ARB IRWMP stakeholders

- **Climate Change/Greenhouse Gas Emissions** – A project is awarded a point if it can demonstrate that it contributes to adapting to the effects of climate change or that it will result in the reduction of greenhouse gas emissions or energy consumption. Detailed project greenhouse gas emissions will be calculated later as the project develops, as part of a California Environmental Quality Act requirement. Detailed energy use data will also be calculated as the project develops. Energy reduction measures implemented by a project may include those outlined in CARB's AB 32 Scoping Report.

- **Disadvantaged Community/Native American Tribal Community/Environmental Justice Considerations** – A project is awarded a point if it can demonstrate that it addresses critical water supply needs of these communities.

The allocation of points is a result of a calibration exercise that reviewed more than three dozen projects in the project database. The raw number of points awarded for the regional priorities score results in a distribution of projects into one of four tiers, which represent the project's level of alignment with regional priorities. The tiers and raw point scores are related as shown in the table below. The regional priorities score is also dynamic, as project proponents can continue to develop and adjust their projects to provide more regional benefits and integration.

Raw Regional Priorities Score	Tier
10 or more points	1
8 or 9 points	2
6 or 7 points	3
5 of less points	4

Note that the scale of the projects, or the quantified level of benefits of the projects (e.g., acres of habitat restored) were not considered. This ensures that smaller projects would not be disadvantaged by larger projects. Additionally, many projects (e.g., environmental and water quality) have benefits that can be difficult to quantify and compare against other projects. Considerations such as the relative contribution of a project's benefits would only be applied to specific criteria associated with distinct funding opportunities.

Detailed project benefit and impact analysis will occur as each project develops and such an analysis becomes required by funding opportunities and/or environmental permitting.

5.7.2.2. Project Implementability Score

This part of the project review process takes into account the readiness of the project to proceed or its overall feasibility. Under this category, up to four points can be awarded based on meeting the criteria listed below. These criteria are also shown in the Report Card in **Figure 5-5**, above.

- **Readiness** – One point is awarded if the project proponent indicates that the project could commence construction (for construction projects) or implementation (for non-construction projects) within 2 years if project funding is available.

- **Feasibility** – One point is awarded if the project proponent is able to complete the project status section of the feasibility tab on the Opti site. Information in this section includes the status and estimated timeline for project tasks and identification of required environmental and other project permits.

- **Project Budget** – One point is awarded if the project proponent completes the project function and project cost breakdown sections of the cost/funding tab on the Opti site. This includes identifying current funding and funding needs as well as a basic project budget broken down by task.

- **Project Benefits** – One point is awarded for projects that complete the benefits section with explanations on the benefits tab of the Opti site. Benefits are organized around the five primary ARB IRWMP goals. This information will be helpful in looking at the benefits to costs of a project, once such an analysis becomes necessary in the future.

Projects are reviewed using the above criteria and assigned to one of four tiers for implementability. The tiers and raw point scores are related as shown in the table below. As with the regional priorities score, this implementability score should be considered dynamic, and it is expected that projects will increase their score as the project develops. It is also expected that some projects will ultimately be removed if they do not continue to develop through time.

Raw Implementability Score	Tier
4 points	A
3 points	B
2 points	C
1 point	D

5.7.3. Project Review Communication and Vetting Process

Projects are scored by RWA, unless project proponents request otherwise. The scores are reviewed by the Advisory Committee. Project proponents have the opportunity to view and receive feedback on how their projects scored and the reasons why. Staff and project proponents communicate to make any scoring adjustments as necessary. This allows project proponents to be aware of their project scores before the scores become available to all stakeholders.

After projects are scored, all scored and non-scored projects are vetted by the Advisory Committee and stakeholders. Project information is communicated to stakeholders through both the Opti Web site and direct e-mails to a distribution list of more than 150 stakeholders that have expressed an interest in the ARB IRWMP. Stakeholders may provide input and comment on any listed project or its score during a 1-month comment period. As described above, a project is not required to receive a score to be included in Opti. However, scoring is necessary for project inclusion in a regional funding application. The final vetted list of projects, identified as "IRWMP Approved" in Opti, is the list of projects selected for inclusion in the IRWMP.

Projects will continue to be accepted on Opti on an ongoing basis, following adoption of the IRWMP. Before being approved for inclusion into the IRWMP, projects will be vetted to stakeholders on a quarterly basis. A summary of projects submitted over the previous quarter will be released at the close of the quarter (i.e., March 31, June 30, September 30, and December 31). Stakeholders would have one month to comment on the projects. For projects that were previously included in the IRWMP but not ranked, project proponents could request rankings and these projected will be vetted on the same quarterly schedule. In cases where a project proponent cannot wait to vet their project until the end of the upcoming quarter (e.g., a funding opportunity with a short schedule arises), RWA will release the project to stakeholders on an as-needed basis. All submitted and vetted projects can be viewed on Opti at http://irwm.rmcwater.com/rwa/login.php.

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Section 6
IRWMP Implementation

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Abbreviations and Acronyms

AB 1755	Open and Transparent Water Data Act
AB	Assembly Bill
ARB	American River Basin
ARBS	American River Basin Study
Caltrans	California Department of Transportation
CNRA	California Natural Resources Agency
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Control Board
DAC	disadvantaged community
DWR	California Department of Water Resources
EDU	equivalent dwelling unit
EJ	environmental justice
EPA	U.S. Environmental Protection Agency
GSA	groundwater sustainability agency
GSP	groundwater sustainability plan
HCD	California Department of Housing and Community Development
I-Bank	California Infrastructure and Economic Development Bank
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
NAB RDCP	North American Basin Regional Drought Contingency Plan
O&M	operation and maintenance
Proposition 1	Water Quality, Supply, and Infrastructure Improvement Act of 2014
Proposition 84	The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006
RCAC	Rural Community Assistance Corporation
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RWA	Regional Water Authority
RWMG	Regional Water Management Group
RWRP	Regional Water Reliability Plan
SAFCA	Sacramento Area Flood Control Agency
SDWSRF	Safe Drinking Water State Revolving Fund
SGMA	Sustainable Groundwater Management Act of 2014
State Water Board	State Water Resource Control Board
SWRP	Storm Water Resource Plan
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
UWMP	Urban Water Management Plan
WIFIA	Water Infrastructure Finance and Innovation Act of 2014
WINN	Water Infrastructure Improvement for the Nation
WRDA	Water Resources Development Act

6. IRWMP IMPLEMENTATION

This section describes implementation of the American River Basin (ARB) Integrated Regional Water Management Plan (IRWMP) Framework elements. Implementation is achieved by advancing ARB IRWMP projects and monitoring their collective progress toward meeting the vision, goals, objectives, and strategies of the IRWMP, including adapting to the impacts of climate change. This section describes IRWMP project financing, IRWMP performance monitoring, data management, benefits and impacts of implementation, and adaptability of the IRWMP to future situations.

6.1. IRWMP Financing

Agencies in the Region have progressively invested in regional integrated planning efforts over the last two decades, such as: the Water Forum Agreement, American River Basin Cooperating Agencies' Regional Water Master Plan; four subregional groundwater management plans; Regional Water Reliability Plan (RWRP); North American Basin Regional Drought Contingency Plan (NAB RDCP); ARB Storm Water Resource Plan (SWRP), West Slope SWRP; American River Basin Study (ARBS); American River Basin Water Market Strategy Project; and numerous watershed-wide plans in support of water quality, environmental, and flood management issues. Groundwater sustainability agencies (GSA) throughout the Region are also currently preparing Groundwater Sustainability Plans (GSP), pursuant to the requirements of the Sustainable Groundwater Management Act of 2014 (SGMA).

Since beginning the effort to develop and maintain an IRWMP in 2004, the Regional Water Authority (RWA) and its partners have invested more than $2.38 million. This has resulted in the 2006, 2013, and 2018 ARB IRWMP Updates, as well as associated tools. Recent sources of funding have included:

- RWA IRWMP Project Participants ($183,000)
- California Department of Water Resources (DWR) Proposition 1 Integrated Regional Water Management (IRWM) Planning Grant ($250,000)

As the Regional Water Management Group (RWMG), RWA is committed to providing resources to maintain and support implementation efforts of the ARB IRWMP. Funding for the 2018 ARB IRWMP Update was provided through a DWR Proposition 1 IRWM Planning Grant, and an IRWM Fee in the annual RWA budget. Additional funds that are needed for continued IRWMP implementation (e.g., monitoring, administration, stakeholder outreach) will be identified and collected during the annual RWA budget development process.

6.2. Project Financing

Some elements of water resource management, such as water supply and wastewater treatment are predominately funded by ratepayer revenues. Others, such as larger capital investments, are funded through local or statewide revenue (DWR 2018). Certain elements of water resource management, such as flood, stormwater, and ecosystem management, often lack a stable or sufficient source of funding. This is an issue both within the Region and statewide.

Financing projects is always a challenge, and it sometimes prevents projects from proceeding to implementation. Although the Region has experienced steady economic growth in recent years, project financing has not kept up with the growing demands on the Region's water systems. An increasing population and a growing economy have created new demands; aging water and wastewater systems require repairs or replacements; and emerging contaminants of concern and stricter water quality requirements carry new costs. Structural funding gaps are often seen in the areas of flood protection, stormwater pollution, aquatic ecosystem management, and integrated water management. These issues will be exacerbated by the impacts of climate change and extreme weather patterns. The recent drought and flooding revealed many vulnerabilities to the Region's water systems and emphasized the need to implement additional regional resiliency and adaptation strategies. At the same time, water purveyors continue to experience many financial constraints, including increasing construction costs, limitations on water rate increases due to Proposition 218, and reduced revenue related to water use efficiency and conservation.

Water affordability is also a growing issue throughout California. Assembly Bill (AB) 685 was passed in 2012, making California the first state in the nation to legislatively recognize the human right to water. AB 401, signed in 2015, directed the State Water Resources Control Board (State Water Board) to develop a plan for the funding and implementation of a Low-Income Water Rate Assistance Program (the plan is anticipated to be completed in early 2019). Additional bills are currently being considered in the legislature to address water affordability issues. Meanwhile, water purveyors, state agencies, and nongovernmental organizations continue to work together to identify sustainable funding for small water systems and address disparity of water costs. While the Region has few small water systems, water purveyors in the Region recognize that implementing and maintaining projects to serve safe water has an effect on water affordability.

Despite financial constraints and limitations on project financing, the Region has successfully implemented a number of projects to realize progress toward the regionally-accepted vision, goals, and objectives. These successes have been achieved through identifying and implementing cost-effective

projects and taking advantage of a variety of financing options. In the last five years, the Region has been awarded over $13 million in federal and state grant funds for large regional plans and IRWM and drought-resiliency projects. While extremely helpful in covering costs, grant program funds are dependent on continued success of applications. Grant funds are also better suited to finance construction or a one-time project cost, as opposed to covering operation and maintenance (O&M) costs. Generally, user fees and rates are more secure and reliable, and are better suited to cover O&M costs than relying on grant funding.

Financing for most of the 2018 ARB IRWMP Update implementation projects has not been identified at this time. One of the key roles of the IRWMP is to identify the implementation needs of the Region's stakeholders. RWA will help its stakeholders move projects forward on an ongoing basis, by providing the IRWMP as a vehicle for other ARB stakeholders to identify, vet, prioritize, and promote projects. RWA's expectation is that natural partnerships will emerge for those projects that benefit multiple stakeholders in the Region. As the RWMG, RWA understands that project implementation should not be overly reliant on grants. The ARB project proponents will continue to pursue many types of appropriate funding, both external (e.g., grants and loans) and internal (e.g., user fees and user rates). The following sections describe some of the various methods for financing project implementation.

Table 6-1 lists priority projects that are currently being implemented at completion of this 2018 ARB IRWMP Update. **Table 6-2** lists projects that have been completed as part of the implementation of the ARB IRWMP since completion of the 2013 ARB IRWMP Update.

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Table 6-1. Current Ongoing ARB IMRWP Implementation Projects

Project Name	Lead Agency/Organization	Approximate Total Cost	Funding Source and % of Total Cost	Funding Certainty	O&M Finance Source	O&M Finance Certainty
Shasta Park Reservoir Groundwater Well No. 2 Project	City of Sacramento	$1,578,454	Prop 84 2011 IRWM Grant (63%); City of Sacramento (37%)	High – Project in Progress	Lead Agency	High
Shasta Park Reservoir and Well Project	City of Sacramento	$35,564,607	Prop 84 2011 IRWM Grant (3%); City of Sacramento (97%)	High – Project in Progress	Lead Agency	High
Lower Cosumnes River Floodplain Restoration Project	Ducks Unlimited	$2,561,750	Prop 84 2011 IRWM Grant (16%); Ducks Unlimited (84%)	High – Project in Progress	Lead Agency	High
Lower Cosumnes River Integrated Groundwater Recharge Project	Omochumne-Hartnell Water District	$1,489,675	Prop 84 2011 IRWM Grant (66%); OHWD (34%)	High – Project in Progress	Lead Agency	High
Sleepy Hollow Detention Basin Retrofit	City of Elk Grove	$1,736,788	Prop 84 2011 IRWM Grant (13%); Elk Grove (87%)	High – Project in Progress	Lead Agency	High
Lower Cosumnes River Integrated Groundwater Recovery Project	Rancho Murieta Community Services District	$1,083,684	Prop 84 2011 IRWM Grant (46%); Rancho Murieta (54%)	High – Project in Progress	Lead Agency	High
Hazel/50 Intertie Improvements Project	City of Folsom	$747,991	Prop 84 2014 Drought IRWM Grant (71%); Folsom (29%)	High – Project in Progress	Lead Agency	High
Main Ditch Piping Project	El Dorado Irrigation District	$8,750,000	Prop 84 2014 Drought IRWM Grant (12%); Reclamation WaterSMART Grant Folsom (11%); EID (77%)	High – Project in Progress	Lead Agency	High
Agricultural Drought Response Incentives Program	Placer County Water Agency	$400,000	Prop 84 2014 Drought IRWM Grant (75%); PCWA (25%)	High – Project in Progress	N/A	N/A
Regional Water Efficiency Drought Measures Program	Regional Water Authority	$1,348,290	Prop 84 2014 Drought IRWM Grant (74%); local partners (26%)	High – Project in Progress	N/A	N/A
Enterprise Intertie Improvements Project	Sacramento Suburban Water District	$185,986	Prop 84 2014 Drought IRWM Grant (56%); SSWD (44%)	High – Project in Progress	Lead Agency	High
Outingdale Water Intake Project	El Dorado Irrigation District	$214,800	Prop 84 2015 IRWM Grant (71%); EID (29%)	High – Project in Progress	Lead Agency	High
Well 10 Hexavalent Chromium Treatment Project	Rio Linda/Elverta Community Water District	$1,667,023	Prop 84 2015 IRWM Grant (30%); RLECWD (70%)	High – Project in Progress	Lead Agency	High
Regional Water Conservation Measures Program	Regional Water Authority	$1,966,000	Prop 84 2015 IRWM Grant (42%); local partners (58%)	High – Project in Progress	N/A	N/A

Key:
ARB = American River Basin
EID = El Dorado Irrigation District
IMRWP = Integrated Regional Water Management Plan
N/A = Not Applicable
O&M = operation and maintenance
OHWD = Citrus Heights Water District
PCWA = Placer County Water Agency
RLECWD = Rio Linda/Elverta Community Water District
SSWD = Sacramento Suburban Water District

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Table 6-2. Completed ARB IRWMP Implementation Projects

Project Name	Lead Agency/Organization
Assessment and Development of Tools for Managing PCE Contamination in the North Sacramento County Groundwater Basin	Sacramento Groundwater Authority
City of Roseville ASR Program - Phase 2	City of Roseville
Secret Ravine Fish Passage Improvement Project	City of Roseville and Dry Creek Conservancy
Antelope Creek Integrated Flood Control Improvement Project	Placer County Flood Control and Water Conservation District
Regional Water Meter Retrofit Acceleration Project	Regional Water Authority
Regional Indoor and Outdoor Water Efficiency Project	Regional Water Authority
Recycled Water for the SMUD Co-Generation Facility	Sacramento Regional County Sanitation District
North Antelope Booster Pump Station	Sacramento Suburban Water District
Coyle Avenue and Roseview Park Pump Stations and Water Treatment Systems Project	Sacramento Suburban Water District
Willow Hill Pipeline Rehabilitation Project	City of Folsom
Aquatic and Riparian Habitat Enhancement in the Lower American River at River Mile 0.5R	Sacramento Area Flood Control Agency
Antelope Creek Integrated Water Efficiency Project	Placer County Water Agency
Upper Unionhouse Creek Flood Protection Project	Sacramento Area Flood Control Agency
Downtown Combined Sewer Upsizing Project	City of Sacramento
Florin Creek Multi-Use Basin	Sacramento Area Flood Control Agency
Separating Fact from Fiction: Assessing the Use of Dry Wells as an Integrated Low Impact Development Tool to Reduce Stormwater Runoff While Protecting Groundwater Quality in Urban Watersheds	City of Elk Grove
Phase 2B Well Rehabilitations	City of Sacramento
Sacramento River Pump Station Modifications	City of Sacramento
Lower American River Pump Station Modifications	City of Sacramento
Madison Well Construction	Fair Oaks Water District
American River Pump Station Improvements	Placer County Water Agency
Striker Well Upgrades	Sacramento County Water Agency
Antelope Booster Pump Station Phase 2	Sacramento Suburban Water District
Barton Road Intertie	San Juan Water District
North Freeway Well Conversion	Sacramento County Water Agency

Key:
ARB = American River Basin
IRWMP = Integrated Regional Water Management Plan
SMUD = Sacramento Municipal Utility District

6.2.1. External Funding Sources

Throughout the IRWMP process, the Region has been fortunate to find a range of opportunities to help fund many identified priority projects. While the primary source of funds is generally from the more traditional sources (e.g., customer rates), external sources of funds have helped successfully move many projects into implementation. Since completion of the 2013 ARB IRWMP Update, more than 20 projects

have secured funding through the DWR IRWM Grant Program. That brings the number of projects supported by IRWM Grant funding since 2006 to over 50.

One of the roles of RWA in implementing the IRWMP is to track funding opportunity announcements and compare these to the projects included in the IRWMP. As specific opportunities emerge, RWA will work with stakeholders to confirm the project and current financing sources are aligned with the funding opportunity. Additionally, RWA will request that project proponents update their finance information for their projects on at least an annual basis.

Below is a brief description of some of the various supplemental funding opportunities available to the various projects within the ARB Region. This list is not exhaustive, but rather illustrates the diversity and extent of funding opportunities that may be available. Much of the information is from the California Financing Coordinating Committee Handbook, which is publically available at: http://cfcc.ca.gov/.

6.2.1.1. State Funding

California has various funding programs that can and do support projects identified in the Region. The most significant state funding sources in the last five years have been the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84) and the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1). Proposition 84 authorized $5.388 billion in general obligation bonds to fund safe drinking water, water quality and supply, flood control, waterway and natural resource protection, water pollution and contamination control, state and local park improvements, public access to natural resources, and water conservation efforts (CNRA 2018). In the Region, Proposition 84 funds have supported implementation of 21 IRWM priority projects.

Proposition 1 was passed by California voters in November 2014. Proposition 1 authorized $7.55 billion in general obligation bonds to make needed investments in the state's water management systems. This included funding for projects and programs that support ecosystem and watershed protection and restoration, water supply infrastructure (including surface and groundwater storage), and drinking water protection. These funds continue to be distributed through grant and loan opportunities administered by various state agencies including DWR, the State Water Board, and the California Water Commission. There are approximately 30 different Proposition 1 grant and loan administration efforts, all on individual timelines. Proposition 1 funds have supported two efforts: 1) the development of the 2018 ARB IRWMP Update, and 2) Disadvantaged Community (DAC) Involvement in IRWM planning and implementation. Propositions 84, Proposition 1, and other state funding sources applicable to ARB IRWMP projects are briefly described below.

California Department of Water Resources

DWR "protects, conserves, develops, and manages" California's water resources for natural and human environments. Its goals are broad, ranging from promoting local and regional water planning and education to developing and managing statewide water resources for supply, flood risk, and the environment. As described below, DWR oversees allocation of Proposition 84 and Proposition 1 funds for IRWM Implementation and Planning Grants, and Proposition 1 funds for Sustainable Groundwater Management Planning Grants, Groundwater Sustainability, and other programs. DWR also oversees revolving loan funds, and technical and facilitation services. The Region and its stakeholders have been successful in securing these funds.

- The Region has been the recipient of several recent grants from the IRWM Program, subsequent to adoption of the 2013 ARB IRWMP Update. These IRWM funding awards are summarized below. The Region will continue to seek and apply for IRWM Project funding and financing support. The Proposal Solicitation Package for Proposition 1 IRWM project implementation funds is anticipated to be released in July 2018.

  - $9.76 million in Proposition 84 Drought Solicitation Grant funds to implement 17 IRWM priority projects that increase the Region's local water supply reliability and delivery of safe drinking water.

  - $1.75 million in Proposition 84 IRWM Implementation grant funds four additional priority projects.

  - $250,000 in Proposition 1 IRWM Planning Grant funds to develop the 2018 ARB IRWMP Update.

  - $3.7 million in Proposition 1 DAC Involvement Grant funds awarded to the Sacramento River IRWM Funding Area to ensure involvement of DACs, economically distressed areas, and underrepresented communities in IRWM planning efforts. Much of the work on this program will occur following the 2018 ARB IRWMP Update, but it is anticipated that a portion of these funds will be available to address DAC issues in the Region.

- The SGMA Facilitation and Technical Support Services Program provides local agencies with tools and professional facilitators to support development of GSPs. Services offered by the professional facilitators include identifying and engaging interested parties, facilitating meetings,

and conducting public outreach. The West Placer GSA received facilitation support services for GSA formation and stakeholder engagement.

- The Proposition 1 Sustainable Groundwater Planning Grant Program is designed to fund development and implementation of GSPs and projects that support the sustainable management of groundwater resources. In 2017, $86.6 million in funding was made available for the planning, development, or preparation of GSPs in high- and medium-priority basins. The Sacramento Groundwater Authority, Sacramento Central Groundwater Authority, and Southeast Sacramento County Agricultural Water Authority were awarded almost $3 million to support development of GSPs for the North American, South American, and Cosumnes subbasins.

State Water Resources Control Board and Regional Water Quality Control Boards

A part of the California Environmental Protection Agency, the five-member State Water Board handles water rights issues, develops statewide protection plans, and establishes water quality standards. The State Water Board's Division of Financial Assistance provides funding for water quality, stormwater, and wastewater-related programs and projects. A portion of the funding provided by the State Water Board originates from Proposition 1, and these funds support programs such as the Clean Water State Revolving Fund, Small Community Wastewater Program, Water Recycling Funding Program, Storm Water Grant Program, and Safe Drinking Water State Revolving Fund. The State Water Board also collects fines to support project development and provides technical assistance. The following is a non-inclusive list of representative funding programs administered by the State Water Board.

- The Clean Water State Revolving Fund Program provides loans to wastewater, water recycling, and expanded use projects.

- The Water Recycling Funding Program issues loans and research grants for projects that promote use of treated wastewater to offset water supplies.

- The Small Community Wastewater Program aids DACs with wastewater project financing.

- The Central Valley Regional Water Quality Control Board (CVRWQCB) manages an ongoing supplemental environmental program that uses collected fines to support various projects.

- The Stormwater Grant Program provides grants to aid multi-benefit stormwater management projects.

- Water or Energy Audit Financial Assistance provides technical assistance to agencies. The agency is encouraged to study water and energy in their audit, but may focus on one or the other. All audits must be related to projects, facilities, or activities that are otherwise eligible for Clean Water State Revolving funding.

- The Proposition 1 Groundwater Grant Program provides grants and loans to cleanup and prevent groundwater contamination for sites that depend on groundwater for their potable water supplies.

- The Safe Drinking Water State Revolving Fund (SDWSRF) provides financial assistance to improve public water systems and drinking water infrastructure that currently pose public health risks and violate federal or state drinking water standards. The SDWSRF receives annual federal grants to finance long-term loans for construction projects and short-term planning grants. Special consideration and rates for DACs apply.

California Infrastructure and Economic Development Bank

The California Infrastructure and Economic Development Bank (I-Bank) was established in 1994 within the California Business, Transportation, and Housing Agency. Governed by five board members, the I-Bank promotes economic revitalization, enables future development, and encourages a healthy climate for jobs in California. They have funding and bonds programs, such as the Infrastructure State Revolving Fund Program, which provides up to 30-year loans of a maximum $25 million per annum to municipalities for public infrastructure. Drinking and wastewater treatment and distribution/collection systems are eligible under this program.

California Department of Housing and Community Development

This California Department of Housing and Community Development (HCD) is responsible for preserving and expanding safe and affordable housing opportunities and promoting strong communities. Located within the California Business, Transportation, and Housing Agency, the role of HCD ranges from developing housing policy and building codes to assisting housing finance and community economic development. Their Community Development Block Grant provides funding to cities and counties. The Community Development allocation provides for public improvements and public services programs, while the Planning and Technical Assistance helps fund that process, such as by assisting project feasibility studies or environmental reviews. Public water programs and improvements would be eligible for this funding.

California Department of Transportation

The California Department of Transportation (Caltrans) provides safe, sustainable, integrated and efficient transportation systems and manages several California highways. Caltrans oversees the Cooperative Implementation Agreements Program, which develops agreements between Caltrans and other responsible parties to conduct work to comply with a Total Maximum Daily Load (TMDL). The Cooperative Implementation Grant Program funds capital projects in impaired watersheds in which Caltrans has been assigned a Waste Load Allocation or otherwise has responsibility for implementation of the TMDL. The Cooperative Implementation Grant Program is funded by Caltrans but administered by the State Water Board.

California Natural Resources Agency

The California Natural Resources Agency (CNRA) is a state agency responsible for protecting historical, natural, and cultural sites, monitoring and controlling state lands and waterways, and regulating fish and game use. The CNRA is the parent department to a number of other departments, including DWR. In addition to funding opportunities through the CNRA's departments and conservancies, its Bonds and Grants Division provides state bond oversight and administers a number of grant programs. These include the Central Valley Project Improvement Act Grant Program, California Urban Rivers Grant Program, Urban Greening Grant Program, Environmental Enhancement and Mitigation Grant Program, and River Parkways Grant Program. Water agencies and nongovernmental organizations in the Region have received recent CNRA grants. For example, the City of Roseville was awarded $400,000 from Urban Rivers Grant Program in 2017 for the Dry Creek Stream Restoration and Water Quality Improvement Project.

6.2.1.2. Federal Funding

Over the past five years, the Region has also been successful in securing over $1.2 million dollars in federal grants, primarily through programs administered by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) largely because of the strong nexus between the Central Valley Project (CVP) and Region's local water resources. In particular, the Region has been able to garnering support for projects and programs that increase the Region's resiliency to the effects of climate change and drought, which directly benefit CVP operations. Below is a non-exhaustive list of identified federal funding opportunities relevant to the Region.

U.S. Department of Agriculture, Rural Development

The U.S. Department of Agriculture, Rural Development finances programs throughout the country to improve the economy and quality of life in rural areas. For their water-related programs, only towns with

under 10,000 in population are designated as rural. The program supports public service utilities to local banks and credit unions to development of agricultural cooperatives. An example use of these funds for water-related programs includes construction and land acquisition for sewer collection system improvements.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) is a federal agency that strives to protect human health and the environment by providing research, standards, and policies that relate to issues such as air pollution, climate change, toxic waste, and drinking water.

- Brownfields grants provide funding for groundwater contamination cleanup projects. Brownfields grants serve as the foundation of the Brownfields Program and support revitalization efforts by funding environmental assessment, cleanup, and job training activities. For example, sites contaminated with petroleum, hazardous substances, pollutants, or contaminants are eligible for up to $200,000 through the Brownfields Cleanup grant.

- The Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) established a federal credit program for eligible water and wastewater infrastructure projects, to be administered by the EPA. WIFIA provides loans of at least $20 million for large-scale construction or improvements of water treatment or community water systems; protection of groundwater and surface water sources; implementation of water efficient, energy efficient or renewable generation technologies; and wastewater and stormwater reuse and control. Examples of WIFIA funded projects in California have included water recycling plant expansions, construction of purified water production facilities, and replacement of wastewater treatment plants.

U.S. Department of the Interior, Bureau of Reclamation

Reclamation is a federal agency that operates in the 17 western states and manages, develops, and protects water resources. Their programs provide cost-shared funding to irrigation districts and urban water agencies for conservation or water management improvement-related activities. Some of their financial assistance programs include the following.

- Bay-Delta Restoration Water Use Efficiency Grants usually fund projects such as canal lining, groundwater banking, leak detection, and irrigation retrofits. This program is administered in partnership with the Natural Resources Conservation Service.

- The WaterSMART Program was established in February 2010 to implement the SECURE Water Act. WaterSMART allows Reclamation to work with states, Tribes, local governments, and non-governmental organizations to pursue a sustainable water supply for the Nation by establishing a framework to provide federal leadership and assistance on the efficient use of water, integrating water and energy policies to support the sustainable use of all natural resources, and coordinating the water conservation activities of the various Department of the Interior offices (Reclamation 2018). The Region has received several WaterSMART grants including $200,000 awarded in 2015 for development of the NAB RDCP and $400,000 in 2017 for development of the ARB Water Marketing Strategy Project. The Region also received $650,000 in direct Reclamation assistance in 2017 for development of the ARBS under the WaterSMART Basin Study Program.

- The Title XVI Water Reclamation and Reuse Program identifies and investigates water recycling and reuse of reclaimed waters. Additional funding has been provided under the Water Infrastructure Improvement for the Nation (WIIN) Act. The WIIN Act was enacted in December 2016, to address water resources infrastructure that is critical to the nation's economic growth, health, and competitiveness. Provisions in the WIIN Act allow new water recycling projects to be eligible for funding. Since 2013, the Title XVI program has supported 42 such projects in California.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) is the largest federal water resources development and management agency. USACE is responsible for administering the Water Resources Development Act (WRDA). WRDA authorizes flood control, navigation, and environmental projects and studies, and often provides congressional authorizations/appropriations to local agencies. The WRDA of 2016 was included as part of the WIIN Act. It contained authorizations for projects that addressed beneficial use of dredged material, desalination, high hazard dam repair, investments in maritime and waterways transportation, and other water resources improvements. Examples of WRDA-funded projects in the Region include $20 million awarded to Sacramento Area Flood Control Agency (SAFCA) in 2007 for the Natomas Levee Project; as well as the Sacramento River Bank Protection Project General Re-Evaluation Report, completed in June 2018. WRDA of 2018 is currently in development in Congress.

6.2.2. Other Funding Sources

The following sections describe other potential funding sources for implementing projects. Many of these sources are internal to municipalities or water agencies, and result from fees or rates collected from constituents or users. While these funding sources are heavily influenced by economic conditions, these

sources are generally more consistent and reliable. Internal funding sources generally cover O&M costs in addition to supporting new projects. Many of the project proponents have internal revenue sources.

6.2.2.1. New Development Fees

Development fees are used by water agencies almost universally as a measure to achieve and maintain equity among its past, present, and future customers. For a growing water agency, development fees can represent more than half of the total revenue in any given year, and as such are very important to existing as well as future customers. Development fees are typically charged per connection, measured in equivalent dwelling units (EDU). A single connection may encompass more than one EDU. In addition to the connection fee aspect of development fees, water agencies may also assess other fees (e.g., commercial acreage fees and other service fees.

In some cases, if a developer builds a water pipeline or large water facility required by a water agency as a condition of development, then as partial or full payment for the water facility, a water agency may give fee credits to the developer in lieu of the developer paying fees. If the value of the water facility exceeds the amount of credits, a reimbursement agreement is typically executed authorizing payment to the developer of the remaining amount owed over a period of time (this does not typically exceed a defined time period).

6.2.2.2. User Fees

Monthly user fees are assessed by some water agencies where a nexus can be made that new facilities are directly benefiting the existing customers. This is especially true for water agencies that are developing conjunctive use water systems where the existing customers may have paid for the groundwater component when they paid the development fee (through the purchase of the home). The surface water and/or recycled water component is a new water supply for a water agency that is needed for conjunctive use with groundwater supplies. Income from this monthly revenue source is used in many cases to pay debt service on debt-financed assets.

6.2.2.3. User Rates

User rates pay for O&M of a water agency or public utility's system. Within the user rate for a water agency there is a fixed cost component that does not vary with the amount of supplied water, such as labor and overhead expenses, and a variable cost component, such as the electrical and chemical costs, that are based on the amount of pumping and applied chemicals to meet the water demands of the customers. A customer of a water agency pays a monthly fixed rate and a variable rate based on the metered usage. In cases where billing is not based on a metered usage, a single monthly flat rate is assessed that is the combined average of the fixed and variable rates.

6.2.2.4. Bonded Debt Service (Revenue Bonds)

Issuance of revenue bonds to pay for new capital is done in cases where a large facility is needed to support current and future growth. In this way, a large facility can be paid for by bonded debt service at the time of construction with repayment of the debt service over a 20- to 30-year time frame. This is a preferred approach to paying for a high-cost facility because it avoids the perceived over-collection of fees from past customers that go toward facilities that serve past and future customers. The downside to bonded debt is that it cannot be accomplished with development fees alone due to the variability and uncertainty of new development over time. A user fee or rate is needed as a bond document covenant in the event that development fees are not adequate to make the required annual payment for the debt service.

6.2.2.5. Rural Community Assistance Corporation

The Rural Community Assistance Corporation (RCAC) provides financial and technical resources, training, and advocacy to rural communities. This agency administers the Environmental Infrastructure Loans program that helps create, improve, or expand the supply of safe drinking water, waste disposal systems, and other facilities that serve rural communities. RCACs loan program provides small rural communities funding to determine feasibility and pay pre-development costs before receiving state and federal program funding. RCAC may provide interim construction financing, as well as intermediate and long-term loans for system improvements.

6.2.2.6. Volunteer Contributions

Volunteer contributions are typically associated with nonprofit organizations or nongovernmental organizations that work toward a given cause. This revenue source is typically not reliable in terms of paying for capital projects or long-term operations. Volunteer contributions are best used for preservation of native land and implementation of public outreach programs. Both are examples where the cost is incurred only if there are sufficient funds to support the activity. Other opportunities for these organizations are partnerships with other project proponents that have more means of generating funding.

6.2.2.7. Mitigation/Settlement Funds

These funds are provided for mitigation related to a project or settlement of a past lawsuit in the Region. Mitigation funds in the Region are generally associated with flood management projects and structures, which require mitigation for resulting habitat losses (e.g., Folsom Dam). CVP mitigation funds have supported habitat restoration associated with water supply operations at Folsom Dam affecting downstream resources. The Sacramento County Abandoned Wells Program was started using funds derived from a groundwater contamination settlement.

6.2.2.8. Special Assessment Districts

Special assessment districts deliver specific voter-approved services within a limited area. Establishing a special assessment district is a common form of collecting needed projects funds. Districts that address flood issues have been particularly successful in securing special assessments within the Region.

6.3. IRWMP Performance Monitoring

Plan performance monitoring is integral to having an effective and adaptive IRWMP into the future. As described in **Section 6.6,** performance monitoring is used to adapt the IRWMP and projects to changing regional needs, the impacts of climate change, and other uncertainties. As the RWMG, RWA is responsible for monitoring progress on the IRWMP and using that information to guide future changes in the plan. There are two types of monitoring needs: one for progress and adaptation of the core IRWMP document, and another for reporting progress on and evaluating projects. Data management is also integral to plan monitoring, and this is described in **Section 6.4**.

6.3.1. Tracking Progress of the IRWMP

RWA is responsible for tracking the progress of the IRWMP. Conducting stakeholder meetings; monitoring progress on goals, objectives, and strategies; and coordinating with other IRWM regions are examples of activities that will continue into the future. Each project proponent is aware of the ARB Framework, including objectives and strategies. Project evaluations and scores are based on a project's ability to meet regional objectives, including adaptation to the impacts of climate change. The relationship of these current strategies and the 18 objectives is shown in **Section 5.5**. Project proponents are encouraged to provide RWA with progress reports when practical, but at a minimum once per year. Examples of types of monitoring and data to report to RWA are described in **Section 6.3.2**. Each project proponent is responsible for managing and sharing project data as specified in **Section 6.4**.

RWA will continue to revisit progress on implementing strategies annually, following up with relevant stakeholders and project proponents. Progress and lessons learned will then be reported to all stakeholders on the ARB list serve and through the Opti Web site. Reaching out to stakeholders has a twofold purpose:

- To inform the Region of ongoing progress and of those who are actively participating
- To report progress on strategies and projects to stakeholders and ensure relevant efforts are not going unnoticed and to promote continued participation in the IRWMP effort

Progress on strategies implies that progress on objectives is also being made. Objectives related to each strategy will be listed in an annual progress summary that will be distributed to stakeholders. Distributing

and communicating progress will in turn inform stakeholders on possible important projects that still need to be developed and implemented as well as any strategy additions or changes that may be needed.

6.3.2. Monitoring Plan for Projects

Depending on funding source requirements, each ARB project will have a monitoring plan, to measure progress not only for the purpose of the ARB IRWMP but also to ensure success of a specific project. Developing and submitting a project monitoring plan and measures to remedy encountered problems will usually be a requirement when receiving external funding (again, depending on funding source). It is important to note that RWA does not have authority to mandate monitoring plans absent requirements from funding sources. However, RWA will provide examples of monitoring plans when not required by specific funding sources, and will promote the value of these plans to regional stakeholders. From past experience, RWA typically obtains the following information in monitoring plans:

- Reports of any quantifiable data being collected that relates to ARB strategies, including what is being measured, units, and date and location of data collection
- Report of any qualitative information that relates to qualitative ARB strategies with the date of description
- Monitoring schedule and frequency of above data collection
- Funding sources of the monitoring plan
- List of any data that apply to this monitoring plan or procedures on how to manage collected data

Examples of types of monitoring a project proponent could engage in are listed by goal in **Table 6-3**.

Table 6-3. Example Types of Monitoring

ARB Goal Category	Types of Monitoring
Water Resources	• Stream flow data • Surface water deliveries • Recycled water deliveries • Groundwater elevation and extraction
Water Quality	• Water quality monitoring (surface water, groundwater, recycled water) • Discharge monitoring • Violations of any discharge requirements
Environmental Resources	• HCP monitoring • GHG monitoring • CEQA/NEPA compliance
Flood Management	• Discharge monitoring • Improved level of flood protection
Community Stewardship	• Customer/community participation • Outreach to local officials

Key:
ARB = American River Basin
CEQA = California Environmental Quality Act
GHG = greenhouse gas
HCP = Habitat Conservation Plan
NEPA = National Environmental Policy Act

6.4. Data Management

Data management is an important aspect of continued implementation of the ARB IRWMP and projects in the Region. Data management can be characterized by how data are collected, stored or maintained, and disseminated or made available to outside users. This section describes data management for projects and regional programs, starting with an overview of ARB project data needs and a description of common data sources for ARB projects. ARB stakeholders monitor data and also contribute to some of these data systems. Next, data gaps in the Region are identified along with a potential way of addressing them. Finally, the last section specifically discusses data management efforts that support statewide data needs.

6.4.1. Overview of IRWMP Project Data Needs

ARB project proponents and their projects require data to plan, design, implement, and monitor their projects. The natural (e.g., hydrologic) and anthropogenic (e.g., land-use conversion) systems of the Region have been extensively monitored for many years. Many of the historical, current, and future monitoring programs pertaining to the Region are useful to the development and implementation of ARB IRWMP projects. Examples of ARB project data needs are listed in **Table 6-4**.

Table 6-4. Sample List of Data Needed for Current and Future IRWMP Projects

Type of Data	Type of IRWMP Project				
	Water Resources	Water Quality	Environmental Resources	Flood Management	Community Stewardship
Surface Water Flows	X	X	X	X	
Surface Water Deliveries	X				
Recycled Water Deliveries	X	X			X
Groundwater Surface Elevations	X				
Groundwater Pumping	X	X			
Hydrogeological Data	X				
Precipitation	X	X		X	
Water Demand	X				X
Water Related Facilities – Location and Size	X	X			
Surface Water, Groundwater, and Recycled Water Quality		X	X	X	
Discharge Monitoring		X	X	X	
Contaminant Plume Locations and Extents	X	X			
Violations of Discharge Requirements		X	X		
Locations of Sensitive Habitats and Species		X	X		
CEQA/NEPA Compliance			X		
Flooding and Floodplain Information				X	
Demographic Data	X	X	X	X	X
Land Use	X	X	X	X	X
Outreach-related Data (e.g., attendance)	X	X	X	X	X
Outreach to Local Officials	X	X	X	X	X

Note: This table shows general data needs for projects. Specific needs of each project will differ.
Key:
CEQA = California Environmental Quality Act
IRWMP = Integrated Regional Water Management Plan
NEPA = National Environmental Policy Act

6.4.2. Frequently Used Data Sources

The above-identified data are available from various sources, including federal, state, and local agencies. **Table 6-5** lists some of the most frequently used databases, including data that were monitored and collected, as well as data outputs from existing numerical models often owned by these agencies. Many of these databases are managed by federal or state entities, external to the Region and authority of the RWA and ARB stakeholders. Water resource-related datasets reside with numerous state, local, and federal

agencies. Furthermore, collection techniques and quality assurance/quality control procedures depend on each data management system. Recognizing these challenges, the Open and Transparent Water Data Act (AB 1755) was signed into law in 2016. AB 1755 requires DWR, in consultation with the California Water Quality Monitoring Council, State Water Board, and California Department of Fish and Wildlife, to create, operate, and maintain a statewide integrated water data platform; and develop open-data protocols for data sharing, transparency, documentation, and quality control. In March 2018, the CNRA unveiled the Open Data Platform and Portal, a new online source for data on the state's natural resources, including water. DWR will integrate the Open Data Platform and Portal with other water-data platforms and add state and federal agency datasets related to water. The water-data platform will be operational with state agency datasets by September 2019. Federal agency datasets will be added by August 2020.

Many ARB stakeholders have monitoring and/or reporting requirements. These stakeholders often work with the relevant state or federal agency to collect and add these data to the larger scale databases. Examples include data collection and reports associated with Urban Water Management Plans (UWMP) (DWR requirement) and National Pollutant Discharge Elimination Program permits (EPA and Central Valley Regional Water Board requirement). SGMA requires GSAs to develop groundwater monitoring protocols and submit annual reports to DWR on progress towards achieving groundwater sustainability within the basin. Monitoring and reporting for IRWM projects that address groundwater sustainability may be included as part of these annual reports. This local contribution of data to larger scale, statewide or national databases is identified in the last column of **Table 6-5**. Public information reported to state or federal agencies will be included as part of the AB 1755 water-data system.

Other databases mentioned in **Table 6-5** are maintained by local ARB agencies, such as Sacramento Groundwater Authority's HydroDMS that monitors groundwater elevations and many other groundwater-related data items. The Sacramento Area Council of Governments is another local agency that compiles, analyzes, and disseminates demographic data for the local six-county (Sacramento, Placer, El Dorado, Yolo, Sutter, and Yuba counties) area.

The information contained in these data management systems, when shared, can provide a more accurate picture of the state of the Region. As the RWMG, RWA will maintain and track progress of the IRWMP, which is also a regional database. As mentioned earlier, progress on IRWMP objectives and strategies will be reported to stakeholders via a list serve as well as through the Opti Web site. Any stakeholder may also post announcements and links pertaining to available data and project information on Opti.

Table 6-5. Frequently Used Data Sources and Their Management Systems

Type of Data	Name of Data Management System	Responsible Party	Location of Data Maintenance and Dissemination Method	ARB Stakeholders Contributing Data
Climatic Data	Western Region Climate Center	Desert Research Institute	http://www.wrcc.dri.edu	N/A
Evapotranspiration	California Irrigation Management Information System	DWR	http://www.cimis.water.ca.gov/	N/A
Watershed Delineations	Watershed Boundary Dataset	USDA, NRCS	http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/water/watersheds/dataset/	N/A
Stream and River Flows and Stages	California Data Exchange Center	DWR	http://cdec.water.ca.gov/	N/A
Stream and River Flows and Quality	Water Data for the Nation	USGS	http://waterdata.usgs.gov/nwis	N/A
Stream and River Water Quality	303(d) Impaired Waters List	U.S. EPA and Central Valley Regional Water Quality Control Board	http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/impaired_waters_list/index.shtml	Agencies with NPDES permits
Reservoir Operations Data	CVO Reports	Reclamation	http://www.usbr.gov/mp/cvo/	N/A
Surface Water Deliveries and its Quality; Water Related Facilities—Location & Size; Water Demand	Urban Water Management Plans, Capital Improvement Programs, and other water supply-related plans	Water Supply Agencies	See each plan or document. Contact RWA or each agency for available data.	Water Supply Agencies
Groundwater Surface Elevations and Quality	California Statewide Groundwater Elevation Monitoring	DWR	https://www.water.ca.gov/Programs/Groundwater-Management/Groundwater-Elevation-Monitoring--CASGEM	Groundwater Management Authorities and GSAs

Table 6-5. Frequently Used Data Sources and Their Management Systems (contd.)

Type of Data	Name of Data Management System	Responsible Party	Location of Data Maintenance and Dissemination Method	ARB Stakeholders Contributing Data
Groundwater Surface Elevations and Quality; Hydrogeological Data; Contaminant Plume Locations and Extents	GSPs or Alternatives to GSPs	Groundwater Management Authorities (WPC, SGA, SCGA, SAWC); GSAs	Data exchange among managers has readily occurred. See GMPs, GSPs, and Basin Reports. Contact each agency for available data. Visit the SGMA Portal for copies of GSPs and Alternatives to GSPs, once developed: https://sgma.water.ca.gov/portal/	Groundwater Management Authorities; GSAs
Groundwater Surface Elevations and Quality of North American Groundwater Subbasin	HydroDMS	SGA	Data exchange among managers has readily occurred. Contact SGA for available data.	SGA
Groundwater Surface Elevations and Quality of South American Groundwater Subbasin	HydroDMS	SCGA	Data exchange among managers has readily occurred. Contact SCGA for available data.	SCGA
Underground Storage Tanks (UST) and On-site Wastewater Treatment Systems (OWTS)	N/A	Sacramento County EMD and Central Valley Regional Water Board	http://www.waterboards.ca.gov/water_issues/programs/ust/; http://www.waterboards.ca.gov/water_issues/programs/owts/	N/A
Contaminant Plume Locations and Extents	N/A	Former Air Force Bases (e.g., McClellan and Mather Field) and Corporations (Aerojet)	Reports monitoring to Central Valley Regional Water Quality Control Board.	Groundwater Authorities
Cleanup Sites and Hazardous Waste Facilities	EnviroStor	California Department of Toxic Substances Control	http://www.envirostor.dtsc.ca.gov/public/	N/A

Table 6-5. Frequently Used Data Sources and Their Management Systems (contd.)

Type of Data	Name of Data Management System	Responsible Party	Location of Data Maintenance and Dissemination Method	ARB Stakeholders Contributing Data
Groundwater Pumping	UWMPs, GSPs and Alternatives to GSPs	Water Supply Agencies; GSA	See UWMPs, GSPs, and water supply-related management plans. Contact each agency or groundwater sustainability agency for available data. Visit the SGMA Portal for copies of GSPs and Alternatives to GSPs, once developed: https://sgma.water.ca.gov/portal/ .	Water Supply Agencies; GSAs
Locations and information on Sensitive Species	California Natural Diversity Database	CDFW	http://www.dfg.ca.gov/biogeodata/cnddb/	Environmental Resources-related agencies (e.g., TNC, Ducks Unlimited)
Locations and information on Sensitive Habitats	The Vegetation Classification and Mapping Program	CDFW	http://www.dfg.ca.gov/biogeodata/vegcamp/	Environmental Resources-related agencies (e.g., TNC, Ducks Unlimited)
Stormwater infrastructure, flows, and quality	SWMPs, NPDES permits	Counties and Cities, including Sacramento Stormwater Quality Partnership	See Stormwater Management Plans and monitoring requirements associated with NPDES permits. Contact each agency for information.	Counties and Cities

Table 6-5. Frequently Used Data Sources and Their Management Systems (contd.)

Type of Data	Name of Data Management System	Responsible Party	Location of Data Maintenance and Dissemination Method	ARB Stakeholders Contributing Data
Flood infrastructure and flooding data	CVFMPP and SFMPP documents	DWR	See state flood documents (includes information on federal structures)	N/A
Flood infrastructure and flood maps	N/A	Local flood agencies (e.g., SAFCA)	Contact each agency	Local flood agencies (e.g., SAFCA)
Demographic Data	U.S. Census	U.S. Census Bureau	http://www.census.gov/main/www/access.html	N/A
Demographic Data, Land Use Data	SACOG Information Center, California Department of Finance	SACOG, State of California	http://www.sacog.org/demographics/, http://www.dof.ca.gov/	Counties and Cities
Outreach-related Data (e.g., attendance)	N/A	ARB Project Proponents	Many agencies and projects require outreach and these data should be publically available	ARB Project Proponents

Key:
ARB = American River Basin
CDFW = California Department of Fish and Wildlife
Central Valley Regional Water Board = Central Valley Regional Water Quality Control Board
CVFMPP = Central Valley Flood Management Planning Program
CVO = Bureau of Reclamation, Central Valley Office
DMS = data management system
DWR = California Department of Water Resources
EPA = Environmental Protection Agency
GMP = groundwater management plan
GSA = groundwater sustainability agency
GSP = groundwater sustainability plan
NRCS = Natural Resources Conservation Service
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
RWA = Regional Water Authority
SACOG = Sacramento Area Council of Governments
Sacramento County EMD = Sacramento County Environmental Management Department
SAFCA = Sacramento Area Flood Control Agency
SAWC = South Area Water Council
SCGA = Sacramento Central Groundwater Authority
SFMP = Statewide Flood Management Planning Program
SGA = Sacramento Groundwater Authority
TNC = The Nature Conservancy
USDA = U.S. Department of Agriculture
USGS = U.S. Geological Survey
UWMP = urban water management plan
WPC = Western Placer County

6.4.3. Data Gaps

Holding conversations among multiple stakeholders to develop and then update the ARB IRWMP strategies have continued to make evident some data gaps in the Region. Some strategies are geared towards filling these identified data gaps (e.g., Strategy WQ7 and CS3). Other strategies were placed in a "Parking Lot," as shown in **Table 5.6**, and stakeholders are currently working together to compile data to form effective strategies. As the IRWMP is implemented, new data gaps will be identified, and each will continue to be addressed by either becoming a strategy itself or by initiating a data compilation effort to inform a strategy. The adaptive characteristic of strategies allows identifying data gaps and addressing them to be both an iterative and collaborative process.

6.4.4. Support of Statewide Data Needs

As noted in **Section 6.4.2**, ARB stakeholders contribute data to some statewide databases, including programs administered by the State Water Board and DWR. ARB stakeholders have supported statewide data needs in the past by voluntary participation in the State Water Board's Groundwater Ambient Monitoring Assessment program. ARB stakeholders are actively participating in the California Statewide Groundwater Elevation Monitoring program. In addition, data collection will continue to be coordinated and shared with the California Environmental Resource Evaluation System, Surface Water Ambient Monitoring Program, and other statewide efforts when appropriate and feasible.

SGMA placed significant new requirements on local agencies to collect and report water management information to the state to demonstrate sustainable groundwater management through implementation of GSPs. GSPs, which will be submitted to DWR, must include data on recharge areas, groundwater levels, groundwater quality, subsidence, and groundwater-surface water interaction. Multiple GSAs in the same subbasin must also coordinate to ensure that the same groundwater elevation and extraction, surface water supply, and total water use data are used. A single data management system must be developed for each subbasin. GSAs in the Region are currently working to develop a coordinated data management system in each subbasin and share data and other information relevant to development of the GSPs.

The ARB SWRP and West Slope SWRP, incorporated as part of this IRWMP, also include discussions on stormwater data collection and management. The ARB SWRP and West Slope SWRP discuss the mechanisms by which data will be stored and managed, how data will be available to stakeholders and the public, how existing water quality and water quality monitoring data will be made available, how often data will be updated, and how data gaps will be identified. By properly managing data, stormwater project proponents, stakeholders, interested parties, elected officials, and the public will better understand water

quantity and quality issues, be able to assess and develop additional potential projects as solutions, and implement projects efficiently.

6.5. Benefits and Impacts of IRWMP Implementation

There are numerous potential benefits and impacts that will result from implementation of the IRWMP. Participation in an integrated, region-wide effort alone has inherent benefits, such as increased regional understanding, economies of scale, and fostering support. These are described briefly below:

- **Increasing Regional Understanding** – By working together as a cohesive group, each party gains a deeper understanding of the effects of its projects on other parties, as well as the effects of other's projects on its own organization. This in turn assists in developing projects that minimize the types of interagency conflicts that can ultimately prevent projects from gaining the support necessary for successful implementation. As examples, future stormwater project implementation and ongoing groundwater management efforts in the Region will require cooperation between multiple agencies.

- **Economies of Scale** – Many of the agencies in the Region use common sources, or combinations of sources of water supply. As a result, many agencies share the same water management challenges. By developing integrated regional approaches to water management together, resources can be pooled, maximizing efficiency on a regional scale that can be of importance when the Region is adapting to climate change or confronting drought conditions. In this way, existing resources can be optimized, duplication of efforts can be avoided, and larger scale efforts can be established, potentially providing a greater benefit than from individual efforts alone.

- **Fostering Support** – When planning is conducted on a regional scale, more parties are involved in projects and more diversity of opinion is introduced in the process, which generally yields better, more informed projects. In collaborative processes, each stakeholder brings his or her own values and priorities to the process, which is ultimately reflected in the plan. This results in projects that not only minimize impacts to more stakeholders, but incorporate benefits to more stakeholders as well. When more benefits are realized and impacts avoided, more support follows.

In addition to these overall benefits, there are expected benefits and impacts of ARB IRWMP projects and programs. This section describes the benefits and impacts from plan implementation at a screening level, including:

- Potential benefits in the Region
- Potential impacts in the Region
- Potential interregional benefits and impacts
- Benefits and impacts to DACs and native tribes

Project proponents quantified these project benefits and impacts where possible during the project submission process. While the project submission form asks about them, the ARB IRWMP itself does not require compliance with California Environmental Quality Act, National Environmental Policy Act, or other local, state, or federal permitting requirements. However, if it is determined that environmental compliance is required for individual projects, the project proponent must prepare appropriate documentation. Benefits and impacts are developed in more detail for each project as part of any required environmental documentation process. In addition to consideration of environmental impacts and benefits, project proponents are asked to consider impacts and benefits related to DACs and tribal communities.

6.5.1. Potential Benefits in the Region

By their nature, IRWMPs are implemented through projects. As of June 2018, the Region's stakeholders have added some 315 projects into the Opti project database, of which 185 total projects have been scored. IRWM projects will continuously evolve as project proponents can submit and update projects in Opti at any time.

Based on information provided by ARB project proponents, proposed projects will achieve multiple benefits by helping the Region meet its objectives. Each project proponent will further examine project-specific benefits as each project is implemented. **Figure 6-1** illustrates that of the scored projects that had at least one objective identified, many had identified multiple objectives. Many projects meet two to four objectives.

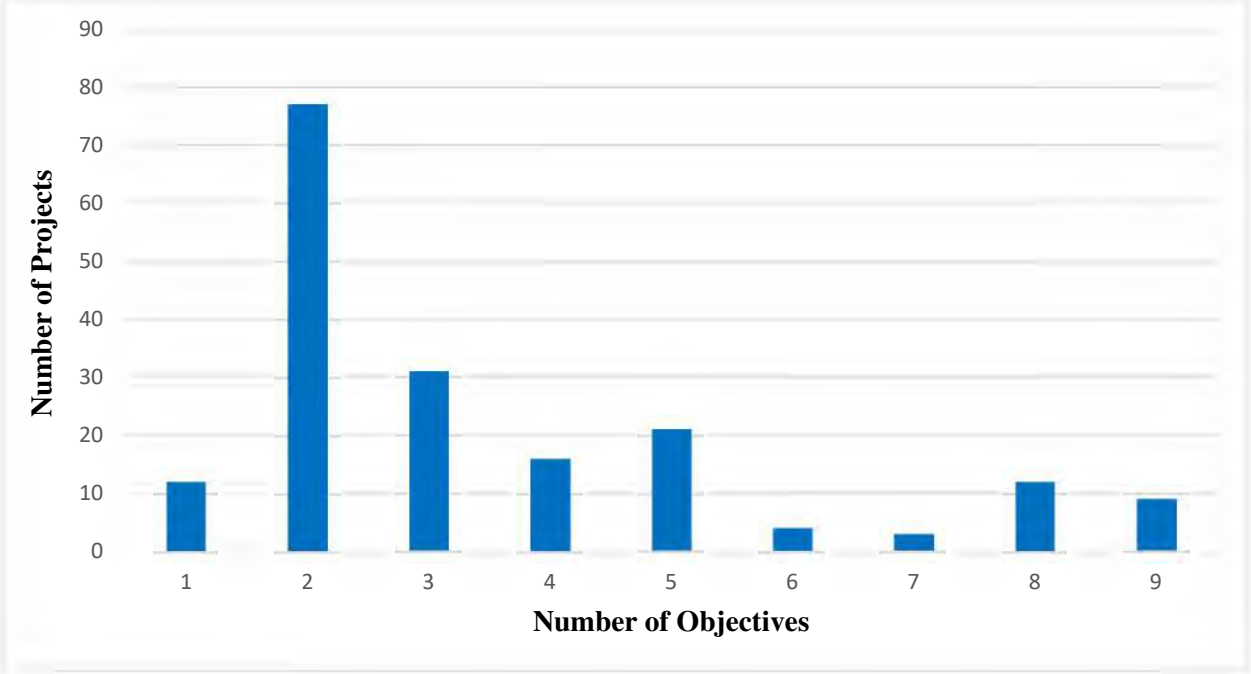

Figure 6-1. Distribution of Projects Meeting Multiple Objectives

Table 6-6 below describes how the set of projects, vetted at the time of this IRWMP adoption, addresses each of the 18 objectives. Refer to **Table 5-2** for a description of each of these objectives.

Table 6-6. Benefits of Plan Implementation by ARB IRWMP Objective

1. Meet current and future water resources needs.
Projects help the Region achieve this broad objective from numerous perspectives. Water supply infrastructure maintenance, improvements, expansions, and construction projects increase the Region's water reliability and create additional opportunities for improved water operation and conjunctive use. Projects that involve resource management plans directly address future water needs. Some projects, such as water metering, improve potable water use efficiency, while others encourage recycled and reclaimed water use to expand the Region's water portfolio. Many stormwater and flood-related projects approach this objective from perspectives of groundwater recharge and water quality protection, which both help to secure future water resources. A few projects specifically study groundwater contamination and its transport, which addresses groundwater quality concerns.
2. Increase water use efficiency.
Projects help the Region achieve this objective by encouraging the use of recycled water for irrigation and industrial demands. This decreases the total amount of water used as a Region. Other projects focus on reducing water losses by upgrading infrastructure to require less operational water or to decrease seepage; by improving monitoring and controlling water transfers; and by decreasing water use by residents, land owners, and small farms.
3. Improve ability to reliably meet water needs during dry or emergency conditions.
Projects help improve the Region's ability to meet water demands during dry or emergency conditions by decreasing water demand, increasing redundancy in water supplies, protecting groundwater as a dry-year resource, and/or promoting drought-proof supplies. Projects that decrease demand emphasize end-user efficiency. Projects that increase redundancy in water supplies involve the construction of emergency interconnections and pumps to create new water wheeling opportunities. Some projects increase surface water storage and treatment capacity for use during dry years. Conjunctive use programs and projects that have groundwater recharge benefits will help dry and emergency situations as well. Groundwater quality protection is also important. Finally, many recycled and reclaimed water projects encourage and develop the use of this reliable resource.
4. Increase the use of recycled water for appropriate uses.
Wastewater agencies throughout the Region have proposed projects to expand the use of recycled water. These projects involve the financing and construction of new distribution pipelines and seasonal storage. Other projects focus on improving recycled water quality for wider acceptability. This improvement can occur through the installation of new technology (e.g., biological nutrient removal) or by improving wastewater quality before flows reach the wastewater treatment plant through an effective Fats, Oil, and Grease (FOG) program. Finally, recycled water projects involve finding new uses for this water supply, including power generation plants, wetlands, agriculture, and golf courses.
5. Remediate contaminated groundwater and reuse it to the extent feasible.
This objective encourages project proponents to view remediated groundwater as a potential resource. Projects that address this objective will attempt to find partners that can make use of reclaimed water. Pipelines, pumps, and other infrastructure will then be constructed to allow for adequate distribution. Only certain agencies within the Region have the opportunity to use remediated water, but use of this water source would decrease reliance on other water resources.

Table 6-6. Benefits of Plan Implementation per ARB IRWMP Objective (contd.)

6. Improve protection of beneficial uses of surface water and groundwater.
This objective addresses water quality issues in the Region. Some projects provide water quality benefits by decreasing source pollution. This includes educating individuals and farmers about best management practices (BMP) to optimize the use of both water and potential runoff contaminants. Low Impact Development (LID) methods decrease urban runoff. Sanitation district FOG outreach programs help remove those constituents from wastewater and potential runoff from landfills. Projects that include improved wastewater treatment decrease nutrient loading into waterways. One project also involves stabilizing spillway channels to decrease sediment loading further downstream. Other projects provide water quality benefits by increasing mitigation or creating a barrier between the contaminant source and waterways. Floodwater detention basins and the habitats they provide can help to physically and biologically treat runoff. Upgrading a water supply canal into a pipe protects raw water from runoff contamination. Projects that destroy abandoned wells effectively eliminate a route for contamination to enter the aquifer. Several projects involve watershed or groundwater modeling studies of contaminants to determine the type of management activities that will be needed in the future. Projects to develop groundwater management plans provide similar benefits as well. Finally, because water quality is influenced by water quantity, recycled water projects and some conjunctive use projects help decrease overall use, thus improving water quality by diluting contaminants in waterways.
7. Recharge and reuse stormwater and urban runoff to the extent practicable.
Several projects that promote LID methods, such as detention basins, wetland preservation, and floodplain reconnection, will help to increase groundwater recharge. Similarly, aquifer storage and recovery (ASR) projects artificially store runoff for future use.
8. Maintain and improve the ecosystem function of area streams and watersheds.
Ecosystem functions refer to various natural processes, such as stream meandering or nutrient cycling. Projects help maintain or improve ecosystem functions through preservation of open space, vernal pools, or riparian areas and by retiring farmland. Many projects have benefits in hydrological and geomorphological processes by helping to restore surface flows, removing barriers, stabilizing or recontouring river banks, and capturing runoff in detention basins or floodplains. Other projects provide benefits for nutrient cycling and aquatic processes by improving water quality. These projects range from installing better treatment plants to enhancing natural filtration, natural buffers, and BMPs. Further, some projects include benefits to life cycles of species by removing barriers and reducing habitat fragmentation. These projects include benefits such as habitat restoration, management of invasive species, and enhancement of biodiversity. Improving nutrient and life cycles also has carbon sequestration benefits. Finally, some projects involve modeling studies and water management plans, which will allow project proponents to consider ecosystem functions when making future water decisions.
9. Maintain and improve habitat of area watersheds.
Projects that produce high-quality recycled water provide an additional water supply for wetlands and conservation easements, which serve as important habitat for many species. These projects also improve habitat quality in the Sacramento-San Joaquin River Delta (Delta) by redirecting treated wastewater flows to beneficial-use locations. Some projects provide increased instream flows by reducing surface water diversions during periods of drought. This helps to maintain aquatic and riparian habitats that provide breeding and foraging habitat for special-status species. Projects that use LID methods, such as detention basins and constructed wetlands, not only treat runoff, but also provide habitat benefits. Finally, other projects involve the direct creation, enhancement, or restoration of habitat areas, such as marches, woodlands, and floodplains, which support a variety of threatened and endangered species.

Table 6-6. Benefits of Plan Implementation per ARB IRWMP Objective (contd.)

10. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible. This objective recognizes that conservation, not just restoration, of existing riparian habitat is important. Projects with conservation benefits include those that specifically preserve land adjacent to waterways by implementing conservation easements, creating open space preserves, or placing land under permanent county protection. Projects that include LID methods, such as drainage basins and corridor enhancements, as well as floodplain and riparian area restoration projects, will help to conserve existing native habitat. A project with invasive species management will help conserve native vegetation by removing nonnative competitors. Finally, other projects that restore groundwater levels near rivers or reduce the use of surface water will help restore surface flows.
11. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses. These projects improve the capacity of the flood management system by increasing channel capacities. This can involve infrastructure improvements of flood structures, but most flood projects involve creating detention basins to store runoff after large storm events or securing land next to waterways to expand the floodplain and diffuse floodwaters. These actions can provide greater protection for downstream communities during periods of flooding. Some of these projects create flood corridors that are reserved for wildlife habitat and flood protection, thus eliminating the possibility of future development in these flood-prone areas.
12. Maintain and improve levees and other flood related infrastructure to reduce flood risk. Some flood projects reduce flood risk by rehabilitating aging levees and channels. This increases conveyance capacity and reduces the possibility of erosion and levee breaches. Infrastructure improvements include levees, detention basins, drainage canals, and weirs. Weirs allow for better management of flood flows.
13. Maintain and restore/reconnect floodplains to provide flood storage and other benefits to reduce flood risk and increase groundwater recharge. Restoration, detention basins, conservation easements, and other projects will reconnect floodplains to adjacent channels by removing barriers and recontouring banks. These projects achieve both increased habitat functionality and flood storage capacity.
14. Improve management of residual flood risks. Residual flood risk is the flood risk that still remains after structural and nonstructural flood management measures have been implemented. This risk is managed by emergency and contingency plans. It may also involve increasing awareness and preparing citizens for such flood events.
15. Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources. For some projects, direct stakeholder or constituent participation is necessary for implementation, such as water efficiency education classes or a FOG program that collects oil from restaurants. These projects will directly increase awareness. Other projects, such as water metering, target increase in awareness of the public through economic incentives. For projects that create or enhance wildlife and floodplain areas, recreational facilities and interpretive signage will inform the public about the flood management and/or ecosystem benefits of these locations. Finally, other projects, such as recycled water projects, include outreach efforts in forms of brochures to garner support.
16. Improve integration of water resources planning with land use planning. Projects help integrate water resources planning and land-use planning by coordinating with land-use agencies in the project areas. Through this coordination, some projects will preserve floodplain property from development, ensuring that this flood-prone land is used instead as wildlife habitat or recreational fields. Such actions help to decrease the liability and damage that flooding can cause in these areas. Recycled water projects require coordination with land-use planning as well, to plan distribution pipelines.

Table 6-6. Benefits of Plan Implementation per ARB IRWMP Objective (contd.)

17. Increase sharing of information, studies, and reports to further advance integrated regional water management. Data collected during the implementation of many of the projects will be compiled in studies and reports and will be made available to interested agencies and stakeholders within the Region. Some projects are pilot projects, where one of the purposes of the project would be information sharing. Many projects also have multiple partners, and many of these project proponents are members of multimember authorities or agencies. Information about these projects will be visible and will be accessible to agencies in these circles. For projects involving regional surface and groundwater modeling, information will be collected from agencies throughout the Region to develop model inputs. Once the modeling is complete, the resulting outputs and analyses will be shared with the entire Region.
18. Manage the Region's groundwater basins sustainably. This objective addresses sustainably managing the quantity and quality of the Region's groundwater resources. GSPs currently being developed for the North American, South American, and Cosumnes groundwater basins will identify specific actions and projects to achieve sustainability no later than 2042. These projects will be implemented by locally-formed GSAs and partner agencies. Before completion and approval of the GSPs, projects may still support the long-term objective of sustainable groundwater management. LID methods increase water runoff infiltration, while also improving runoff quality. Stormwater runoff capture and use projects can reduce demand for groundwater sources, especially for on-site non-potable uses such as outdoor irrigation. Conjunctive use projects store surface water in groundwater basins in wet years when supplies are plentiful, and withdraw it from basins in dry years.

Key
ARB = American River Basin
IRWMP = Integrated Regional Water Management Plan

6.5.2. Potential Impacts in the Region

Implementation of projects in the ARB IRWMP will also have impacts. Some anticipated impacts are local and temporary, associated with construction. Other potential impacts require appropriate foresight and management to mitigate or minimize them. There also may be financial impacts, related to costs to the community for implementing a project or program. Project-level impacts are unavoidable, but effective IRWM ensures that benefits from multiple projects outweigh the costs and that benefits are shared as equitably as possible. **Table 6-7** identifies potential impacts of different types of ARB projects.

Table 6-7. Potential Impacts of Types of ARB Projects

Project Type	Potential Impacts
Water supply projects	• Increasing water supplies for human consumption and ensuring supply reliability may increase the challenge of balancing environmental needs.
Water efficiency projects	• Water efficiency projects may result in decreased aggregate water use, reducing revenue for water supply agencies. This may also lead to a reduced amount of water available for water recycling.
Groundwater projects	• Improperly implemented, these projects can damage the aquifer, introduce contaminants or further spread contamination plumes, increase greenhouse gas emissions (through energy use for pumping), or may lower the water table at a local or regional scale.
Wastewater and recycled water projects	• Advanced treatment may require more chemical and energy use, increasing costs and greenhouse gas emissions. • Projects that increase recycled water use could detrimentally decrease the amount of wastewater (flow) returning to the environment and impact species that rely on this water. • Recycled water projects could increase salt and nutrient loading to groundwater basins.
Projects that involve construction, including restoration projects	• Construction creates temporal impacts from excavation, which disrupts the surrounding areas.
Environmental resources projects	• Unless properly managed, environmental projects that create new habitats may also create additional water demands, with potential effects on overall water supply reliability.
Flood and stormwater management projects	• Projects that only examine local flooding effects may shift risk from the project location to another area in the watershed by changing flow patterns and/or increasing contaminants. • Reconnecting and expanding a floodplain area may require taking that land out of current land uses, impacting the landowner. • Better flood management may reduce understanding and acknowledgement of actual ongoing flood risks by the public.

Additionally, there could be impacts if the ARB IRWMP and/or its component projects are not well-managed or implemented. These impacts may include:

- Increased project/program costs to agencies and rate payers/constituents
- Delayed construction/operation of planned facilities and programs, and therefore delaying or decreasing intended benefits (e.g., delayed water supply reliability benefits)
- Delayed construction/operation of planned facilities and programs, leading to increased or prolonged negative impacts (e.g., increased impacts on water quality and fisheries)

Specific impacts of projects would need to be identified by project proponents during preparation of environmental and permitting activities before project implementation.

6.5.3. Potential Interregional Benefits and Impacts

Projects contained in the IRWMP not only benefit local agencies but will be beneficial to neighboring areas. This is especially true for projects that affect watersheds or groundwater basins, because these boundaries often extend beyond the Region. Jurisdictional boundaries extend beyond the Region as well, which may transfer project benefits/impacts. Specific interregional benefits and impacts would need to be considered at the time of implementation of projects that may have a relationship to adjacent IRWM management areas. Coordination is documented with these groups in **Section 3.4**. As the RWMG, RWA would ensure that communication of any relevant projects occurs before implementation commences.

6.5.4. Benefits and Impacts to DACs and Native Tribes

As described in **Section 3.1.4 and 3.1.5**, DACs and environmental justice (EJ) concerns in the Region are generally not characterized by isolated communities with water supply, water quality, or wastewater service availability concerns. The exception may be small pockets of the Region served by small water systems and/or private wells. Flood risk issues may also disproportionately affect DACs as well, as many DACs are located in high-risk floodplains. Some projects that will benefit DAC and EJ concerns could include the following:

- Infrastructure improvement projects that benefit DAC pockets in larger service areas
- Groundwater quality projects that improves water quality in small systems
- Flood management projects that help protect high-risk DAC communities

Moving forward, the Region will ensure that implemented projects or programs do not create new DAC or EJ concerns.

Two groups of Native American tribes reside in the Region. Some projects that will benefit tribes could include the following:

- Ecosystem and riparian improvement projects that support traditional uses such as fishing and gathering
- Flood management projects that protect heritage sites

The Region does not believe there to be large tribal water concerns. However, outreach to encourage their participation in this IRWMP is still ongoing, as described in **Section 3.1.5**. Following additional collaboration, tribal-related water concerns and means to address them will be identified during IRWMP implementation.

6.6. IRWMP Adaptability to Future Situations

The 2018 ARB IRWMP Update and associated planning is meant to be a living process that is routinely and continually updated to reflect the evolving needs of the Region and stakeholder communities. In addition, the Region recognizes that there are inherent uncertainties in the planning process, especially those associated with climate change. The Region will adaptively manage implementation of the plan and associated projects to respond to these uncertainties.

The Climate Change Handbook for Regional Water Planning describes adaptive management as "identifying and monitoring the most important uncertainties and translating them into risk triggers or early warning indicators" (EPA and DWR 2011). Adaptive management is a central part of the Region's IRWM planning and implementation process. As described in **Section 2.10,** the Region has completed a number of studies and technical analyses to identify regional uncertainties, vulnerabilities, and adaptation and resiliency measures. These studies include the climate change assessment conducted for the 2013 ARB IRWMP Update, NAB RDCP, RWRP, and Sacramento and San Joaquin Rivers Basin Study. Other local regional and local planning efforts that address climate change impacts include climate action plans, sustainability plans, general plan updates, local hazard mitigation plans, and urban water management plans.

In addition, the ongoing ARBS and ARB Water Marketing Strategy Project will further identify and refine regional vulnerabilities and adaptation measures and identify a path for implementation. The ARBS will examine strategies to integrate or better coordinate local and federal water management practices, incorporate new scientific information on climate change that are specific to the Region, and address significant recent changes in conditions and regulatory requirements related to the CVP and regional water management. This includes the Biological Opinions for endangered fishery species protection and protection of the Sacramento-San Joaquin Delta, SGMA implementation, and water rights administration in drought conditions. The ARB Water Marketing Strategy Project will evaluate the potential for water market asset development; determine the infrastructure investments needed to realize that market; and formulate an implementation plan that includes recommendations on governance, reporting and monitoring procedures.

The Region will use new information and tools developed as part of the ARBS, ARB Water Marketing Strategy Project, and other future planning efforts to re-assess IRWMP strategies and projects. In addition, the Region will use IRWMP and project performance monitoring, described in **Section 6.3**, to re-assess any uncertainties and, if necessary, re-identify vulnerabilities and adaptation measures. Adapting the IRWMP to future situations will involve the update of specific elements, such as projects and strategies, on a fairly continuous basis. Other more static elements, such as the vision and goals, will require updates less often and at an undetermined frequency.

As described in **Section 5**, the IRWMP Framework and its strategies and projects support adaptability to future situations, as both of these elements are designed to be dynamic and adaptive. The list of IRWMP projects will be updated and reported quarterly. Projects can be submitted on the Opti Website at any time, as described in **Section 5.7**, and other stakeholders will have access to this information in real time. RWA will score these new projects every quarter, (unless the project is under a shorter funding application deadline), and stakeholders will vet the projects and their scores for formal addition to the IRWMP. Therefore, the list of approved projects will always be aligned to regional and statewide priorities. The Opti Website also provides a means for stakeholders throughout the Region to communicate, supporting ongoing awareness and integration. As noted in **Section 5.6**, new strategies can also be modified, suggested, reviewed by stakeholders, and added formally to the IRWMP quarterly. New strategies will likely be needed as older strategies are completed, with new stakeholders, or new needs becoming evident through implementation of the IRWMP.

Whether current projects are appropriate in meeting the set of objectives and strategies and addressing climate change impacts will become evident through consistent monitoring and analysis, as described in **Section 6.3**. Monitoring will also assist in determining the planned vs. actual 'regional value' of the project by creating a clear reporting mechanism for stakeholders, water managers, and other regional planners. Thus, monitoring will also inform necessary subsequent strategies or project changes, supporting adaptive management of the Region. Further, RWA has adopted the maintenance of the IRWMP as one of the organization's core functions (as opposed to a subscription program, which it has previously been), responsible for continued implementation and adaptation into the future.

Another component of the IRWMP subject to update is the narrative components of the plan itself. The IRWMP is to be published as an electronic document, with only a very limited number of hard copies to be made available to stakeholders that do not have access to the electronic version. As new information becomes available (e.g., new water supply and demand information published every 5 years in UWMPs),

the RWMG may choose to update the regional description section (**Section 2**). Updated sections of the IRWMP would be posted to the Web site with appropriate version documentation being provided.

Other triggers may necessitate a larger scale update and readoption of the IRWMP. These triggers include, but are not exclusive to:

- New IRWM Guidelines or requirements
- A need to change the Region's boundary, such as contraction, expansion, or consolidation with another region
- Additional proposed studies or projects (e.g., regional modeling exercise) that may benefit overall planning in the ARB IRWMP
- New information (e.g., updated climate models) or policy/operational changes (e.g., federal or state water operation changes) that could have significant impacts to local water resources.

The NAB RDCP and local Water Shortage Contingency Plans also identify water shortage triggers for agencies to perform assessments of their water supplies. Historically, drought has been the most common of these shortage concerns. The purpose of these assessments is to evaluate if the hydrologic conditions will affect current and future local ability to meet customer demands. If supply projections do not equal or exceed demand projections, an agency could activate its Water Shortage Contingency Plan through an action of its governing body to decrease demand until it matches supply projections (PCWA et al. 2017).

A summary of IRWMP actions or modifications, their anticipated frequencies, and whether or not RWMG approval is necessary is included in **Table 6-8** below. Actions subject to approval by the RWMG would be taken at regular, publicly noticed meetings of RWA.

Table 6-8. Summary of Likely IRWMP Implementation Actions

Action	Frequency	RWMG Approval
Adoption of the ARB IRWMP by additional stakeholders	Open	No
Updates to vision, goals, objectives	As needed	Yes
Updates to strategies and projects	Quarterly	No
Modifications to the project ranking method	As needed	Yes
Updates to ARB IRWMP Boundary	As needed	Yes
Changes to the ARB IRWMP governance structure	As needed	Yes
Changes to write-ups of individual sections of ARB IRWMP	As needed	No
ARB IRWMP Implementation Report	Annual	No, but to be presented to RWMG
Updates to comply with revised IRWMP Guidelines	As needed	Yes
Updates to respond to new information or other policy changes	As needed	Yes
Authorization of new studies that may benefit overall planning in the ARB IRWMP Region	As needed	Yes

Key:
ARB = American River Basin
IRWMP = Integrated Regional Water Management Plan
RWMG = Regional Water Management Group

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Section 7
References

Sacramento River Hydrologic Region

Sacramento ARB Region

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CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT	:	DISCUSSION AND POSSIBLE ACTION TO APPROVE PROFESSIONAL SERVICES AGREEMENT FOR INFORMATION TECHNOLOGY SERVICES
STATUS	:	Action Item
REPORT DATE	:	September 6, 2018
PREPARED BY	:	Jeff Ott, Principal Information Technology Analyst

OBJECTIVE:
Consider approving the accompanying professional services agreement with Wolf Consulting and authorize the General Manager to approve task orders issued under the agreement.

BACKGROUND AND ANALYSIS:
The District has long maintained the practice of utilizing consultants to provide general information technology consulting services to support the District's various technology systems. The new Principal Information Technology Analyst (PITA) will be utilizing consultants to provide very specific technical services related to the support and maintenance of the District's systems and equipment. When the PITA position was created, as a division of one, it was anticipated that when required consultant assistance would be required to address vacation, sick, special projects and peek workload.

Glenn Wolf, of Wolf Consulting, has been providing services to the District through previous consulting firms engaged by the District to implement and maintain the District's various systems. Glenn was instrumental in the original implementation of the District's Geographic Information and Maintenance Management Systems. As such, the District would like to engage Wolf Consulting to provide services to support the District's Geographic Information and Maintenance Management Systems along with related database administration and network security. This current agreement was sole sourced from Wolf Consulting in accordance to District Policy 6500.16 for Single Source Purchases. Glenn Wolf has deep and exclusive knowledge of our network and systems which provides savings in future maintenance and support activities.

District staff (PITA) will prepare task releases against the agreement that will be approved by the General Manager or designee in accordance with District purchasing limits.

Funding for activities provided in 2018 budget and requested in 2019 budget. Consultant may also be awarded task releases for specific project work related to District systems and equipment.

RECOMMENDATION:
Authorize the General Manager to sign the professional services agreement between the District and Wolf Consulting and to issue and approve related task releases against the agreement in accordance with District purchasing limits.

ATTACHMENTS:
1. Professional Services Agreement for Wolf Consulting

ACTION:

Moved by Director _____, Seconded by Director _____, Carried _____

CITRUS HEIGHTS WATER DISTRICT
PROFESSIONAL SERVICES AGREEMENT
FOR WOLF CONSULTING

1. PARTIES AND DATE.

This Agreement is made and entered into this 5th day of September, 2018, by and between the Citrus Heights Water District, a public agency organized and operating under the laws of the State of California with its principal place of business at 6230 Sylvan Road, Citrus Heights, CA 95610 ("District") and Glenn Wolf, DBA Wolf Consulting, a Sole-Proprietor with its principal place of business at 195 River Loop 1, Eugene, OR 97404 ("Consultant"). District and Consultant are sometimes individually referred to as "Party" and collectively as "Parties" in this Agreement.

2. RECITALS.

2.1 District. District is a public agency organized under the laws of the State of California, with power to contract for services necessary to achieve its purpose.

2.2 Consultant. Consultant desires to perform and assume responsibility for the provision of certain professional services required by the District on the terms and conditions set forth in this Agreement and in the task order(s) to be issued pursuant to this Agreement and executed by the District and Consultant ("Task Order"). Consultant represents that it is experienced in providing all of the support services listed in the scope of services provided for in Exhibit "A" to public clients, is licensed in the State of California, and is familiar with the plans of District.

2.3 Project. District desires to engage Consultant to render such services on an on-call basis. Services shall be ordered by Task Order(s) to be issues pursuant to this Agreement for future projects as set forth herein (each such project shall be designated a "Project" under this Agreement).

3. TERMS.

3.1 Scope of Services and Term.

3.1.1 General Scope of Services. Consultant promises and agrees to furnish to the District all labor, materials, tools, equipment, services, and incidental and customary work, on an on-call basis, as necessary to fully and adequately supply the professional information technology and related consulting services necessary for the Project ("Services"). The types of Services to be provided are generally described in Exhibit "A," attached hereto and incorporated herein by reference. The Services shall be more particularly described in the individual Task Order issued by the District's General Manager or designee. No Service shall be performed unless authorized by a fully executed Task Order in the form attached hereto as Exhibit "B". All Services shall be subject to, and performed in accordance with, this Agreement, the relevant Task Order,

the exhibits attached hereto and incorporated herein by reference, and all applicable local, state and federal laws, rules and regulations.

3.1.2 Term. The term of this Agreement shall be from September 5th, 2018 until terminated as provided herein. Consultant shall meet any other established schedules and deadlines set forth in the applicable Task Order. All applicable indemnification provisions of this Agreement shall remain in effect following the termination of this Agreement.

3.2 Responsibilities of Consultant.

3.2.1 Control and Payment of Subordinates; Independent Contractor. The Services shall be performed by Consultant or under its supervision. Consultant will determine the means, methods and details of performing the Services subject to the requirements of this Agreement and such directions and amendments from District as herein provided. District retains Consultant on an independent contractor basis and not as an employee. No employee or agent of Consultant shall become an employee of District. Any additional personnel performing the Services under this Agreement on behalf of Consultant shall also not be employees of District and shall at all times be under Consultant's exclusive direction and control. Consultant shall pay all wages, salaries, and other amounts due such personnel in connection with their performance of Services under this Agreement and as required by law. Consultant shall be responsible for all reports and obligations respecting such additional personnel, including, but not limited to: social security taxes, income tax withholding, unemployment insurance, disability insurance, and workers' compensation insurance.

3.2.2 Schedule of Services. Consultant shall perform the Services expeditiously, within the term of this Agreement, and in accordance with the specific schedule that shall be set forth in the Task Order ("Schedule of Services"). Consultant shall be required to commence work within five (5) days, or as soon thereafter as reasonably practicable, of receiving a fully executed Task Order. Consultant represents that it has the professional and technical personnel required to perform the Services in conformance with such conditions. In order to facilitate Consultant's conformance with the Schedule of Services, District shall respond to Consultant's submittals in a timely manner. Upon request of District, Consultant shall provide a more detailed schedule of anticipated performance to meet the Schedule of Services.

3.2.3 Conformance to Applicable Requirements. All work prepared by Consultant shall be subject to the approval of District.

3.2.4 RESERVED.

3.2.5 District's Representative. The District hereby designates the General Manager, or his or her designee, to act as its representative for the performance of this Agreement ("District's Representative"). District's Representative shall have the power to act on behalf of the District for all purposes under this Contract. Consultant shall not accept direction or orders from any person other than the District's Representative or his or her designee.

3.2.6 Consultant's Representative. Consultant hereby designates Glenn Wolf, or his or her designee, to act as its representative for the performance of this Agreement

("Consultant's Representative"). Consultant's Representative shall have full authority to represent and act on behalf of the Consultant for all purposes under this Agreement. The Consultant's Representative shall supervise and direct the Services, using his best skill and attention, and shall be responsible for all means, methods, techniques, sequences and procedures and for the satisfactory coordination of all portions of the Services under this Agreement.

3.2.7 Coordination of Services. Consultant agrees to work closely with District staff in the performance of Services and shall be available to District's staff, consultants and other staff at all reasonable times.

3.2.8 Standard of Care; Performance of Employees. Consultant shall perform all Services under this Agreement in a skillful and competent manner, consistent with the standards generally recognized as being employed by professionals in the same discipline in the State of California. Consultant represents and maintains that it is skilled in the professional calling necessary to perform the Services. Consultant warrants that all employees and subcontractors shall have sufficient skill and experience to perform the Services assigned to them. Finally, Consultant represents that it, its employees and subcontractors have all licenses, permits, qualifications and approvals of whatever nature that are legally required to perform the Services, including a City of Citrus Heights Business License, and that such licenses and approvals shall be maintained throughout the term of this Agreement. As provided for in the indemnification provisions of this Agreement, Consultant shall perform, at its own cost and expense and without reimbursement from the District, any services necessary to correct errors or omissions which are caused by the Consultant's failure to comply with the standard of care provided for herein. Any employee of the Consultant or its sub-consultants who is determined by the District to be uncooperative, incompetent, a threat to the adequate or timely completion of the Project, a threat to the safety of persons or property, or any employee who fails or refuses to perform the Services in a manner acceptable to the District, shall be promptly removed from the Project by the Consultant and shall not be re-employed to perform any of the Services or to work on the Project.

3.2.9 Laws and Regulations. Consultant shall keep itself fully informed of and in compliance with all local, state and federal laws, rules and regulations in any manner affecting the performance of the Project or the Services, including all Cal/OSHA requirements, and shall give all notices required by law. If required, Consultant shall assist District, as requested, in obtaining and maintaining all permits required of Consultant by federal, state and local regulatory agencies. Consultant shall be liable for all violations of local, state and federal laws, rules and regulations in connection with the Project and the Services. If the Consultant performs any work knowing it to be contrary to such laws, rules and regulations and without giving written notice to the District, Consultant shall be solely responsible for all costs arising therefrom. Consultant shall defend, indemnify and hold District, its officials, directors, officers, employees and agents free and harmless, pursuant to the indemnification provisions of this Agreement, from any claim or liability arising out of any failure or alleged failure to comply with such laws, rules or regulations.

3.2.10 Insurance.

3.2.10.1 Time for Compliance. Consultant shall not commence the Services under this Agreement until it has provided evidence satisfactory to the District that it has secured all insurance required under this section. In addition, Consultant shall not allow any

subcontractor to commence work on any subcontract until it has provided evidence satisfactory to the District that the subcontractor has secured all insurance required under this section.

3.2.10.2 Minimum Requirements. Consultant shall, at its expense, procure and maintain for the duration of the Agreement insurance meeting the requirements set forth herein. In the event Consultant is self-insured, Consultant shall provide evidence of self-insured coverage that provides coverage that is equal to the insurance requirements set forth herein. Consultant shall require all of its subcontractors to procure and maintain the same insurance specified herein for the duration of the Agreement. Such insurance shall meet at least the following minimum levels of coverage:

(A) Minimum Scope of Insurance. Coverage shall be at least as broad as the latest version of the following: (1) *General Liability*: Insurance Services Office Commercial General Liability coverage (occurrence form CG 0001); (2) *Automobile Liability*: Insurance Services Office Business Auto Coverage form number CA 0001, code 1 (any auto); (3) *Workers' Compensation and Employer's Liability*: Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance; and (4) *Professional Liability (Errors and Omissions)*: professional liability or Errors and Omissions insurance appropriate to its profession.

(B) Minimum Limits of Insurance. Consultant shall maintain limits no less than: (1) *General Liability:* One Million Dollars ($1,000,000) per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with general aggregate limit is used, either the general aggregate limit shall apply separately to this Agreement/location or the general aggregate limit shall be twice the required occurrence limit; (2) *Automobile Liability:* One Million Dollars ($1,000,000) combined single limit (each accident) for bodily injury and property damage; (3) *Workers' Compensation and Employer's Liability:* Workers' Compensation limits as required by the Labor Code of the State of California. Employer's Liability limits of One Million Dollars ($1,000,000) per accident for bodily injury or disease; and (4) *Professional Liability (Errors and Omissions)*: One Million Dollars ($1,000,000) per claim and aggregate (errors and omissions).

Requirements of specific coverage or limits contained in this section are not intended as a limitation on coverage, limits, or other requirement, or a waiver of any coverage normally provided by any insurance. Any available coverage shall be provided to the parties required to be named as additional insured pursuant to this Agreement. Defense costs shall be payable in addition to the limits.

3.2.10.3 Insurance Endorsements. The insurance policies shall contain the following provisions, or Consultant shall provide endorsements on forms supplied or approved by the District to add the following provisions to the insurance policies:

(A) Commercial General Liability. The commercial general liability policy shall be endorsed to provide the following: (1) the District, its directors, officials, officers, employees, agents and volunteers shall be covered as additional insureds using ISO endorsement forms CG 20 10 10 01 and 20 37 10 01, or endorsements providing the exact same coverage; (2) the insurance coverage shall be primary insurance as respects the District, its

directors, officials, officers, employees, agents and volunteers, or if excess, shall stand in an unbroken chain of coverage excess of the Consultant's scheduled underlying coverage. Any insurance or self-insurance maintained by the District, its directors, officials, officers, employees, agents and volunteers shall be excess of the Consultant's insurance and shall not be called upon to contribute with it in any way; and (3) the insurance coverage shall contain or be endorsed to provide waiver of subrogation in favor of the District, its directors, officials, officers, employees, agents and volunteers or shall specifically allow Consultant to waive its right of recovery prior to a loss. Consultant hereby waives its own right of recovery against District, and shall require similar written express waivers and insurance clauses from each of its subconsultants.

(B) Automobile Liability. The automobile liability policy shall be endorsed to provide the following: (1) the District, its directors, officials, officers, employees, agents and volunteers shall be covered as additional insureds with respect to the ownership, operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by the Consultant or for which the Consultant is responsible; (2) the insurance coverage shall be primary insurance as respects the District, its directors, officials, officers, employees, agents and volunteers, or if excess, shall stand in an unbroken chain of coverage excess of the Consultant's scheduled underlying coverage. Any insurance or self-insurance maintained by the District, its directors, officials, officers, employees, agents and volunteers shall be excess of the Consultant's insurance and shall not be called upon to contribute with it in any way; and (3) the insurance coverage shall contain or be endorsed to provide waiver of subrogation in favor of the District, its directors, officials, officers, employees, agents and volunteers or shall specifically allow Consultant to waive its right of recovery prior to a loss. Consultant hereby waives its own right of recovery against District, and shall require similar written express waivers and insurance clauses from each of its subconsultants.

(C) Workers' Compensation and Employers Liability Coverage. The insurer shall agree to waive all rights of subrogation against the District, its directors, officials, officers, employees, agents and volunteers for losses paid under the terms of the insurance policy which arise from work performed by the Consultant.

(D) Professional Liability (Errors and Omissions). This insurance shall be endorsed to include contractual liability applicable to this Agreement and shall be written on a policy form coverage specifically designed to protect against acts, errors or omissions of the Consultant. "Covered Professional Services" as designated in the policy must specifically include work performed under this Agreement. The policy must "pay on behalf of" the insured and must include a provision establishing the insurer's duty to defend.

(E) All Coverages. Each insurance policy required by this Agreement shall be endorsed to state that: (1) coverage shall not be suspended, voided, reduced or canceled except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the District; and (2) any failure to comply with reporting or other provisions of the policies, including breaches of warranties, shall not affect coverage provided to the District, its directors, officials, officers, employees, agents and volunteers.

3.2.10.4 Separation of Insureds; No Special Limitations. All insurance required by this Section shall contain standard separation of insureds provisions. In addition, such

insurance shall not contain any special limitations on the scope of protection afforded to the District, its directors, officials, officers, employees, agents and volunteers.

3.2.10.5 Deductibles and Self-Insurance Retentions. Any deductibles or self-insured retentions must be declared to and approved by the District. Consultant shall guarantee that, at the option of the District, either: (1) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the District, its directors, officials, officers, employees, agents and volunteers; or (2) the Consultant shall procure a bond guaranteeing payment of losses and related investigation costs, claims and administrative and defense expenses.

3.2.10.6 Acceptability of Insurers. Insurance is to be placed with insurers with a current A.M. Best's rating no less than A:VII, admitted to transact in the business of insurance in the State of California, or otherwise allowed to place insurance through surplus line brokers under applicable provisions of the California Insurance Code or any federal law, and satisfactory to the District.

3.2.10.7 Verification of Coverage. Consultant shall furnish District with original certificates of insurance and endorsements effecting coverage required by this Agreement on forms satisfactory to the District. The certificates and endorsements for each insurance policy shall be signed by a person authorized by that insurer to bind coverage on its behalf, and shall be on forms provided by the District if requested. All certificates and endorsements must be received and approved by the District before work commences. The District reserves the right to require complete, certified copies of all required insurance policies, at any time.

3.2.10.8 Subconsultants. Consultant shall not allow any subcontractors or subconsultants to commence work on any subcontract until they have provided evidence satisfactory to the District that they have secured all insurance required under this section. Policies of commercial general liability insurance provided by such subcontractors or subconsultants shall be endorsed to name the District as an additional insured using ISO form CG 20 38 04 13 or an endorsement providing the exact same coverage. If requested by Consultant, District may approve different scopes or minimum limits of insurance for particular subcontractors or subconsultants.

3.2.10.9 Compliance With Coverage Requirements. If at any time during the life of the Agreement, any policy of insurance required under this Agreement does not comply with these specifications or is canceled and not replaced, District has the right but not the duty to obtain the insurance it deems necessary and any premium paid by District will be promptly reimbursed by Consultant or District will withhold amounts sufficient to pay premium from Consultant payments. In the alternative, District may terminate this Agreement for cause.

3.2.11 Safety. Consultant shall execute and maintain its work so as to avoid injury or damage to any person or property. In carrying out its Services, the Consultant shall at all times be in compliance with all applicable local, state and federal laws, rules and regulations, and shall exercise all necessary precautions for the safety of employees appropriate to the nature of the work and the conditions under which the work is to be performed. Safety precautions as applicable shall include, but shall not be limited to: (1) adequate life protection and life-saving equipment and procedures; (2) instructions in accident prevention for all employees and subcontractors, such as equipment and other safety devices, equipment and wearing apparel as are necessary or lawfully

required to prevent accidents or injuries; and (3) adequate facilities for the proper inspection and maintenance of all safety measures.

3.3 Fees and Payments.

3.3.1 Compensation. Consultant shall receive compensation, including authorized reimbursements, for all Services rendered under this Agreement at the rates set forth in Exhibit "A," attached hereto and incorporated herein by reference. The total compensation per Task Order shall be set forth in the relevant Task Order, and Consultant shall be compensated in one of two billable methods: a) Time and Materials/Hourly Billable; or b) Project Basis/Not-to-Exceed (NTE) amount. Extra Work may be authorized, as described below; and if authorized, said Extra Work will be compensated at the rates and manner set forth in this Agreement.

3.3.2 Payment of Compensation. Consultant shall submit to District a monthly itemized invoice which indicates work completed and hours of Services rendered by Consultant. The invoice shall reference the relevant Task Order and describe the amount of Services and supplies provided since the initial commencement date of Services under this Agreement, and since the start of the subsequent billing periods, through the date of the invoice. Consultant shall include a Project Task Tracking Sheet with each invoice submitted. District shall, within forty-five (45) days of receiving such invoice and Project Task Tracking Sheet, review the invoice and pay all approved charges thereon.

3.3.3 Reimbursement for Expenses. Consultant shall not be reimbursed for any expenses unless authorized under Exhibit "B" or otherwise in writing by District.

3.3.4 Extra Work. At any time during the term of this Agreement, District may request that Consultant perform Extra Work. As used herein, "Extra Work" means any work which is determined by District to be necessary for the proper completion of the Project, but which the Parties did not reasonably anticipate would be necessary at the execution of this Agreement. Consultant shall not perform, nor be compensated for, Extra Work without written authorization from District's Representative. Where Extra Work is deemed merited by the District, an amendment to this Agreement shall be prepared by the District and executed by both Parties before performance of such Extra Work, or the District will not be required to pay for the changes in the scope of work. Such amendment shall include the change in fee and/or time schedule associated with the Extra Work. Amendments for Extra Work shall not render ineffective or invalidate unaffected portions of this Agreement

3.3.5 Prevailing Wages. Consultant is aware of the requirements of California Labor Code Sections 1720 et seq., and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq., ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. If the Services are being performed as part of an applicable "public works" or "maintenance" project, as defined by the Prevailing Wage Laws, and if the total compensation is One Thousand Dollars ($1,000) or more, Consultant agrees to fully comply with such Prevailing Wage Laws. Consultant shall obtain a copy of the prevailing rates of per diem wages in effect at the commencement of this Agreement. Consultant shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to execute

the Services available to interested parties upon request, and shall post copies at the Consultant's principal place of business and at the project site. Consultant shall defend, indemnify and hold the District, its officials, officers, employees, volunteers and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or alleged failure to comply with the Prevailing Wage Laws.

If the Services are being performed as part of an applicable "public works" or "maintenance" project, then pursuant to Labor Code Sections 1725.5 and 1771.1, the Consultant and all subconsultants performing such Services must be registered with the Department of Industrial Relations. Consultant shall maintain registration for the duration of the Project and require the same of any subconsultants, as applicable. This Project may also be subject to compliance monitoring and enforcement by the Department of Industrial Relations. It shall be Consultant's sole responsibility to comply with all applicable registration and labor compliance requirements.

3.4 Accounting Records.

3.4.1 Maintenance and Inspection. Consultant shall maintain complete and accurate records with respect to all costs and expenses incurred under this Agreement. All such records shall be clearly identifiable. Consultant shall allow a representative of District during normal business hours to examine, audit, and make transcripts or copies of such records and any other documents created pursuant to this Agreement. Consultant shall allow inspection of all work, data, documents, proceedings, and activities related to the Agreement for a period of three (3) years from the date of final payment under this Agreement.

3.5 General Provisions.

3.5.1 Termination of Agreement.

3.5.1.1 Grounds for Termination. Either party may terminate the whole or any part of this Agreement at any time and without cause by giving written notice to the other party of such termination, and specifying the effective date thereof, at least fifteen (15) days before the effective date of such termination. Upon termination, Consultant shall be compensated only for those Services which have been adequately rendered to District, and Consultant shall be entitled to no further compensation.

3.5.1.2 Effect of Termination. If this Agreement is terminated as provided herein, District may require Consultant to provide all finished or unfinished Documents and Data (defined below) and other information of any kind prepared by Consultant in connection with the performance of Services under this Agreement. Consultant shall be required to provide such documents and other information within fifteen (15) days of the request.

3.5.1.3 Additional Services. In the event this Agreement is terminated in whole or in part as provided herein, District may procure, upon such terms and in such manner as it may determine appropriate, services similar to those terminated.

3.5.2 Delivery of Notices. All notices permitted or required under this Agreement shall be given to the respective Parties at the following address, or at such other address as the respective parties may provide in writing for this purpose:

District	**Consultant**
Citrus Heights Water District	Wolf Consulting
P.O. Box 286	P.O. Box 41828
Citrus Heights, CA 95611	Eugene, OR 97404
Attn: Hilary Straus, General Manager	Attn: Glenn Wolf

Such notice shall be deemed made when personally delivered or when mailed, forty-eight (48) hours after deposit in the U.S. Mail, first class postage prepaid and addressed to the Party at its applicable address. Actual notice shall be deemed adequate notice on the date actual notice occurred, regardless of the method of service.

3.5.3 Ownership of Materials and Confidentiality.

3.5.3.1 Documents & Data; Licensing of Intellectual Property. This Agreement creates a non-exclusive and perpetual license for District to copy, use, modify, reuse, or sublicense any and all copyrights, designs, and other intellectual property embodied in plans, specifications, studies, drawings, estimates, and other documents or works of authorship fixed in any tangible medium of expression, including but not limited to, physical drawings or data magnetically or otherwise recorded on computer diskettes, which are prepared or caused to be prepared by Consultant under this Agreement ("Documents & Data"). Consultant shall require all subcontractors to agree in writing that District is granted a non-exclusive and perpetual license for any Documents & Data the subcontractor prepares under this Agreement. Consultant represents and warrants that Consultant has the legal right to license any and all Documents & Data. Consultant makes no such representation and warranty in regard to Documents & Data which were prepared by design professionals other than Consultant or provided to Consultant by the District. District shall not be limited in any way in its use of the Documents & Data at any time, provided that any such use not within the purposes intended by this Agreement shall be at District's sole risk.

3.5.3.2 Confidentiality. All ideas, memoranda, specifications, plans, procedures, drawings, descriptions, computer program data, input record data, written information, and other Documents & Data either created by or provided to Consultant in connection with the performance of this Agreement shall be held confidential by Consultant. Such materials shall not, without the prior written consent of District, be used by Consultant for any purposes other than the performance of the Services. Nor shall such materials be disclosed to any person or entity not connected with the performance of the Services or the Project. Nothing furnished to Consultant which is otherwise known to Consultant or is generally known, or has become known, to the related industry shall be deemed confidential. Consultant shall not use District's name or insignia, photographs of the Project, or any publicity pertaining to the Services or the Project in any magazine, trade paper, newspaper, television or radio production or other similar medium without the prior written consent of District.

3.5.4 Cooperation; Further Acts. The Parties shall fully cooperate with one another, and shall take any additional acts or sign any additional documents as may be necessary, appropriate or convenient to attain the purposes of this Agreement.

3.5.5 Attorney's Fees. If either Party commences an action against the other Party, either legal, administrative or otherwise, arising out of or in connection with this Agreement, the prevailing party in such litigation shall be entitled to have and recover from the losing party reasonable attorney's fees and all other costs of such action.

3.5.6 Indemnification.

3.5.6.1 Standard Indemnification. To the fullest extent permitted by law, Consultant shall defend, indemnify and hold the District, its officials, officers, employees, volunteers, and agents free and harmless from any and all claims, demands, causes of action, costs, expenses, liability, loss, damage or injury, in law or equity, to property or persons, including wrongful death, in any manner arising out of, pertaining to, or relating to any negligence, recklessness, or willful misconduct of Consultant, its officials, officers, employees, agents, consultants, and contractors arising out of or in connection with the performance of the Services, the Project or this Agreement, including without limitation the payment of all consequential damages, expert witness fees, and attorney's fees and other related costs and expenses. Consultant shall defend, at Consultant's own cost, expense and risk, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against District, its directors, officials, officers, employees, agents, or volunteers. Consultant shall pay and satisfy any judgment, award or decree that may be rendered against District or its directors, officials, officers, employees, agents, or volunteers, in any such suit, action or other legal proceeding. Consultant shall reimburse District and its directors, officials, officers, employees, agents, and/or volunteers, for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided, including correction of errors and omissions. Consultant's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the District, its directors, officials officers, employees, agents or volunteers.

3.5.7 Entire Agreement. This Agreement contains the entire Agreement of the Parties with respect to the subject matter hereof, and supersedes all prior negotiations, understandings or agreements. This Agreement may only be modified by a writing signed by both Parties.

3.5.8 Governing Law. This Agreement shall be governed by the laws of the State of California. Venue shall be in Sacramento County.

3.5.9 Time of Essence. Time is of the essence for each and every provision of this Agreement.

3.5.10 District's Right to Employ Other Consultants. District reserves right to employ other consultants in connection with this Project.

3.5.11 Assignment or Transfer. Consultant shall not assign, hypothecate, or transfer, either directly or by operation of law, this Agreement or any interest herein without the

prior written consent of the District. Any attempt to do so shall be null and void, and any assignees, hypothecates or transferees shall acquire no right or interest by reason of such attempted assignment, hypothecation or transfer.

3.5.12 Subcontracting. Consultant shall not subcontract any portion of the work required by this Agreement, except as expressly stated herein, without prior written approval of District. Subcontracts, if any, shall contain a provision making them subject to all provisions stipulated in this Agreement.

3.5.13 Construction; References; Captions. Since the Parties or their agents have participated fully in the preparation of this Agreement, the language of this Agreement shall be construed simply, according to its fair meaning, and not strictly for or against any Party. Any term referencing time, days or period for performance shall be deemed calendar days and not work days. All references to Consultant include all personnel, employees, agents, and subcontractors of Consultant, except as otherwise specified in this Agreement. All references to District include its officials, officers, employees, agents, and volunteers except as otherwise specified in this Agreement. The captions of the various articles and paragraphs are for convenience and ease of reference only, and do not define, limit, augment, or describe the scope, content, or intent of this Agreement.

3.5.14 Amendment; Modification. No supplement, modification, or amendment of this Agreement shall be binding unless executed in writing and signed by both Parties.

3.5.15 Waiver. No waiver of any default shall constitute a waiver of any other default or breach, whether of the same or other covenant or condition. No waiver, benefit, privilege, or service voluntarily given or performed by a Party shall give the other Party any contractual rights by custom, estoppel, or otherwise.

3.5.16 No Third Party Beneficiaries. There are no intended third party beneficiaries of any right or obligation assumed by the Parties.

3.5.17 Invalidity; Severability. If any portion of this Agreement is declared invalid, illegal, or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions shall continue in full force and effect.

3.5.18 Prohibited Interests. Consultant maintains and warrants that it has not employed nor retained any company or person, other than a bona fide employee working solely for Consultant, to solicit or secure this Agreement. Further, Consultant warrants that it has not paid nor has it agreed to pay any company or person, other than a bona fide employee working solely for Consultant, any fee, commission, percentage, brokerage fee, gift or other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, District shall have the right to rescind this Agreement without liability. For the term of this Agreement, no member, officer or employee of District, during the term of his or her service with District, shall have any direct interest in this Agreement, or obtain any present or anticipated material benefit arising therefrom.

3.5.19 Equal Opportunity Employment. Consultant represents that it is an equal opportunity employer and it shall not discriminate against any subcontractor, employee or applicant for employment because of race, religion, color, national origin, handicap, ancestry, sex or age. Such non-discrimination shall include, but not be limited to, all activities related to initial employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination.

3.5.20 Labor Certification. By its signature hereunder, Consultant certifies that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and agrees to comply with such provisions before commencing the performance of the Services.

3.5.21 Authority to Enter Agreement. Consultant has all requisite power and authority to conduct its business and to execute, deliver, and perform the Agreement. Each Party warrants that the individuals who have signed this Agreement have the legal power, right, and authority to make this Agreement and bind each respective Party.

3.5.22 Counterparts. This Agreement may be signed in counterparts, each of which shall constitute an original.

[Signatures on Following Page]

SIGNATURE PAGE
TO
CITRUS HEIGHTS WATER DISTRICT
PROFESSIONAL SERVICES AGREEMENT
FOR SUPPORT SERVICES

CITRUS HEIGHTS WATER DISTRICT	WOLF CONSULTING
By: _____	By: _____
Hilary M. Straus General Manager	Glenn Wolf Owner
Date: _____	Date: 9/5/2018

EXHIBIT "A"
SCOPE OF SERVICES

Consultant will provide on-call (as directed) services to the District as directed by the Principal Information Technology Analyst covering the following technical areas:

1. ArcGIS Database administration, geodatabase updates and maintenance, application programming and general user support.
2. General SQL Server database administration.
3. General SQL Server Reporting Services and SQL Server Integration Services design and development.
4. Network security consulting services covering SCADA and business networks.
5. Cityworks support and maintenance services.

EXHIBIT "B"

EXAMPLE TASK ORDER

Task Order No. XXXX-XX

Contract: <Contract Title>

Consultant: <Consultant Name>

The Consultant is hereby authorized to perform the following work subject to the provisions of the Contract identified above:

1. Scope item 1
2. Scope item 2.
3. Scope item 3.

List any attachments:

Compensation Form: Consultant will bill District at a rate of $XXX.XX per hour.

Reimbursements: Consultant will bill District for any preauthorized direct expenses relating to travel and other direct costs for completing the scope of work.

Dollar Amount of Task Order: Not to exceed $XX,XXX.XX (If NTE)

Completion Date: <Completion date of task release scope>

The undersigned consultant hereby agrees that it will provide all equipment, furnish all materials, except as may be otherwise noted above, and perform all services for the work above specified in accordance with the Contract identified above and will accept as full payment therefore the amount shown above.

Citrus Heights Water District	**Consultant**
Dated:_____	Dated:_____
By: _____	By: _____

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 REGULAR MEETING

SUBJECT	: DISCUSSION AND POSSIBLE ACTION TO APPROVE AN AGREEMENT TO PREFUND OTHER POST-EMPLOYMENT BENEFITS THROUGH THE CALPERS CALIFORNIA EMPLOYERS' RETIREE BENEFIT TRUST PROGRAM
STATUS	: Action Item
REPORT DATE	: September 5, 2018
PREPARED BY	: Alberto Preciado, Senior Accountant Susan Sohal, Administrative Services Manager

OBJECTIVE:
Consider action to:

- Approve an agreement to prefund Other Post-Employment Benefits (OPEB) through the California Public Employers' Retirement System (CalPERS) California Employers' Retiree Benefit Trust (the CERBT) Program;
- Adopt resolution 16-2018 delegating authority to request disbursements from the CERBT; and
- Authorize the General Manager to execute any necessary documents with CalPERS to fund and maintain participation in the CERBT.

BACKGROUND AND ANALYSIS:
Pursuant to Citrus Heights Water District (the District) Policy No. 4831 *Insurance Benefits for Retirees Retiring After March 19, 1996*, the District provides reimbursement for the cost of health, dental, and vision insurance for qualified retired employees and qualified dependents based on length of service to the District.

At the Board of Directors' (the Board) Regular Meeting on June 13, 2017, John Bartel, President of Bartel & Associates presented the December 31, 2016 Actuarial Valuation of the District's Retiree Healthcare Plan. After the presentation, the Board directed staff to explore options to prefund the District's OPEB Unfunded Actuarial Accrued Liability (UAAL), and the Board subsequently approved a 15-year accelerated payoff of the OPEB UAAL, with annual payments of $80,000 in addition to annual (Pay-As-You-Go) costs. The Board then approved an $80,000 prefunding payment in the 2018 Budget.

Staff evaluated the programs of three OPEB Trust providers: the CERBT (managed by CalPERS), Public Agency Retirement Services (PARS), and MuniMET provided by Keenan. All three programs are complaint with the Internal Revenue Code Section 115. Evaluation criteria included administrative costs, historical investment returns, ease of implementation of GASB statements, and size of plans.

Staff presented the results of this evaluation to the Board at the August 15, 2018 meeting. Staff recommended the selection of the CERBT, and sought and received consensus direction from the Board to proceed with final evaluations of the CERBT.

Staff contacted local and similar agencies who are participants in the CERBT for references and feedback on their experiences with the program. Agencies contacted were the Sacramento Suburban Water District, the

San Juan Water District, Carmichael Water District, and the El Dorado Irrigation District. The feedback received was positive, highlighting rapid response to emails and calls, low fees vs. good returns, and visits by CERBT staff to explain reports.

Staff recommends joining the CERBT program. CERBT has over 500 participating agencies, of which 92 are water and irrigation districts. CERBT provides the lowest administration costs with competitive investment returns. Finally, the CERBT program provides additional resources, reporting, and services that would need to be performed by staff with PARS or Keenan.

If the Board approves the agreement to join the CERBT, the District will need to choose one of the CERBT's three investment strategies. The long-term expected rate of return for the three asset allocation strategies is as follows:

Asset Allocation Strategy	Long-Term Expected Rate of Return
Strategy 1	7.59%
Strategy 2	7.01%
Strategy 3	6.22%

Staff recommends that the District select Strategy 2, the moderate approach, which would provide lower risk than Strategy 1, but with potential for higher returns than Strategy 3.

RECOMMENDATION:

Approve an agreement to prefund Other Post-Employment Benefits (OPEB) through the California Public Employers' Retirement System (CalPERS) California Employers' Retiree Benefit Trust (the CERBT) Program; adopt resolution 16-2018 delegating authority to request disbursements from the CERBT; and authorize the General Manager to execute any necessary documents with CalPERS to fund and maintain participation in the CERBT.

ATTACHMENTS:

1) Agreement to Prefund Other Post-Employment Benefits through CalPERS
2) Resolution 16-2018
3) Delegation of Authority Form

ACTION:

Moved by Director _____, Seconded by Director _____, Carried _____

ATTACHMENT 1

Agreement to Prefund Other Post-Employment Benefits through CalPERS

CALIFORNIA EMPLOYERS' RETIREE BENEFIT TRUST PROGRAM ("CERBT")

AGREEMENT AND ELECTION OF

Citrus Heights Water District

(NAME OF EMPLOYER)

TO PREFUND OTHER POST-EMPLOYMENT BENEFITS THROUGH CalPERS

WHEREAS (1) Government Code Section 22940 establishes in the State Treasury the Annuitants' Health Care Coverage Fund for the prefunding of health care coverage for annuitants (Prefunding Plan); and

WHEREAS (2) The California Public Employees' Retirement System (CalPERS) Board of Administration (Board) has sole and exclusive control and power over the administration and investment of the Prefunding Plan (sometimes also referred to as CERBT), the purposes of which include, but are not limited to (i) receiving contributions from participating employers and establishing separate Employer Prefunding Accounts in the Prefunding Plan for the performance of an essential governmental function (ii) investing contributed amounts and income thereon, if any, in order to receive yield on the funds and (iii) disbursing contributed amounts and income thereon, if any, to pay for costs of administration of the Prefunding Plan and to pay for health care costs or other post-employment benefits in accordance with the terms of participating employers' plans; and

WHEREAS (3) the Citrus Heights Water District

(NAME OF EMPLOYER)

(Employer) desires to participate in the Prefunding Plan upon the terms and conditions set by the Board and as set forth herein; and

WHEREAS (4) Employer may participate in the Prefunding Plan upon (i) approval by the Board and (ii) filing a duly adopted and executed Agreement and Election to Prefund Other Post-Employment Benefits (Agreement) as provided in the terms and conditions of the Agreement; and

WHEREAS (5) The Prefunding Plan is a trust fund that is intended to perform an essential governmental function within the meaning of Section 115 of the Internal Revenue Code as an agent multiple-employer defined benefit plan as defined in Governmental Accounting Standards Board (GASB) Statements for Accounting and Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans (OPEB Standards) consisting of an aggregation of single-employer plans, with pooled administrative and investment functions;

NOW, THEREFORE, BE IT RESOLVED THAT EMPLOYER HEREBY MAKES THE FOLLOWING REPRESENTATION AND WARRANTY AND THAT THE BOARD AND EMPLOYER AGREE TO THE FOLLOWING TERMS AND CONDITIONS:

A. Representation and Warranty

Employer represents and warrants that it is a political subdivision of the State of California or an entity whose income is excluded from gross income under Section 115 (1) of the Internal Revenue Code.

B. Adoption and Approval of the Agreement; Effective Date; Amendment

(1) Employer's governing body shall elect to participate in the Prefunding Plan by adopting this Agreement and filing with the CalPERS Board a true and correct original or certified copy of this Agreement as follows:

Filing by mail, send to:
CalPERS
CERBT (OPEB)
P.O. Box 1494
Sacramento, CA 95812-1494

Filing in person, deliver to:
CalPERS Mailroom
CERBT (OPEB)
400 Q Street
Sacramento, CA 95811

(2) Upon receipt of the executed Agreement, and after approval by the Board, the Board shall fix an effective date and shall promptly notify Employer of the effective date of the Agreement.

(3) The terms of this Agreement may be amended only in writing upon the agreement of both CalPERS and Employer, except as otherwise provided herein. Any such amendment or modification to this Agreement shall be adopted and executed in the same manner as required for the Agreement. Upon receipt of the executed amendment or modification, the Board shall fix the effective date of the amendment or modification.

(4) The Board shall institute such procedures and processes as it deems necessary to administer the Prefunding Plan, to carry out the purposes of this Agreement, and to maintain the tax exempt status of the Prefunding Plan. Employer agrees to follow such procedures and processes.

C. Other Post-Employment Benefits (OPEB) Cost Reports and Employer Contributions

(1) Employer shall provide to the Board an OPEB cost report on the basis of the actuarial assumptions and methods prescribed by the Board. Such report shall be for the Board's use in financial reporting, and shall be prepared at least as often as the minimum frequency required by applicable GASB OPEB Standards. This OPEB cost report may be prepared as an actuarial valuation report or, if the employer is qualified under GASB OPEB Standards, may be prepared as an Alternative Measurement Method (AMM) report.

(a) Unless qualified under GASB OPEB Standards, to provide an AMM report, Employer shall provide to the Board an actuarial valuation report. Such report shall be for the Board's use in financial reporting, and shall be prepared at least as often as the minimum frequency required by GASB OPEB Standards, and shall be:

1) prepared and signed by a Fellow or Associate of the Society of Actuaries who is also a Member of the American Academy of Actuaries or a person with equivalent qualifications acceptable to the Board;

2) prepared in accordance with generally accepted actuarial practice and GASB OPEB Standards; and,

3) provided to the Board prior to the Board's acceptance of contributions for the valuation period or as otherwise required by the Board.

(b) If qualified under GASB OPEB Standards, Employer may provide to the Board an AMM report. Such report shall be for the Board's use in financial reporting, shall be prepared at least as often as the minimum frequency required by GASB OPEB Standards, and shall be:

1) affirmed by Employer's external auditor, or by a Fellow or Associate of the Society of Actuaries who is also a Member of the American Academy of Actuaries or a person with equivalent qualifications acceptable to the Board, to be consistent with the AMM process described in GASB OPEB Standards;

2) prepared in accordance with GASB OPEB Standards; and,

3) provided to the Board prior to the Board's acceptance of contributions for the valuation period or as otherwise required by the Board.

(2) The Board may reject any OPEB cost report for financial reporting purposes submitted to it, but shall not unreasonably do so. In the event that the Board

determines, in its sole discretion, that the OPEB cost report is not suitable for use in the Board's financial statements or if Employer fails to provide a required OPEB cost report, the Board may obtain, at Employer's expense, an OPEB cost report that meets the Board's financial reporting needs. The Board may recover from Employer the cost of obtaining such OPEB cost report by billing and collecting from Employer or by deducting the amount from Employer's account in the Prefunding Plan.

(3) Employer shall notify the Board of the amount and time of contributions which contributions shall be made in the manner established by the Board.

(4) Employer contributions to the Prefunding Plan may be limited to the amount necessary to fully fund Employer's actuarial present value of total projected benefits, as supported by the OPEB cost report for financial reporting purposes acceptable to the Board. As used throughout this document, the meaning of the term "actuarial present value of total projected benefits" is as defined in GASB OPEB Standards. If Employer's contribution causes its assets in the Prefunding Plan to exceed the amount required to fully fund the actuarial present value of total projected benefits, the Board may refuse to accept the contribution.

(5) No contributions are required. Contributions can be made at any time following the effective date of the Agreement provided that Employer has first complied with the requirements of Paragraph C.

D. Administration of Accounts, Investments, Allocation of Income

(1) The Board has established the Prefunding Plan as an agent plan consisting of an aggregation of single-employer plans, with pooled administrative and investment functions, under the terms of which separate accounts are maintained for each employer so that the Employer's assets will provide benefits only under the Employer's post-employment benefit plan(s).

(2) All Employer contributions and assets attributable to Employer contributions shall be separately accounted for in the Prefunding Plan (Employer's Prefunding Account).

(3) Employer's Prefunding Account assets may be aggregated with prefunding account assets of other employers and may be co-invested by the Board in any asset classes appropriate for a Section 115 Trust.

(4) The Board may deduct the costs of administration of the Prefunding Plan from the investment income or Employer's Prefunding Account in a manner determined by the Board.

(5) Investment income shall be allocated among participating employers and posted to Employer's Prefunding Account as determined by the Board but no less frequently than annually.

(6) If Employer's assets in the Prefunding Plan exceed the amount required to fully fund the actuarial present value of total projected benefits, the Board, in compliance with applicable accounting and legal requirements, may return such excess to Employer.

E. Reports and Statements

(1) Employer shall submit with each contribution a contribution report in the form and containing the information prescribed by the Board.

(2) The Board shall prepare and provide a statement of Employer's Prefunding Account at least annually reflecting the balance in Employer's Prefunding Account, contributions made during the period and income allocated during the period, and such other information as the Board determines.

F. Disbursements

(1) Employer may receive disbursements not to exceed the annual premium and other costs of post-employment healthcare benefits and other post-employment benefits as defined in GASB OPEB Standards.

(2) Employer shall notify CalPERS in writing in the manner specified by CalPERS of the persons authorized to request disbursements from the Prefunding Plan on behalf of Employer.

(3) Employer's request for disbursement shall be in writing signed by Employer's authorized representative, in accordance with procedures established by the Board. The Board may require that Employer certify or otherwise establish that the monies will be used for the purposes of the Prefunding Plan.

(4) Requests for disbursements that satisfy the requirements of paragraphs (2) and (3) will be processed monthly.

(5) CalPERS shall not be liable for amounts disbursed in error if it has acted upon the written instruction of an individual authorized by Employer to request disbursements. In the event of any other erroneous disbursement, the extent of CalPERS' liability shall be the actual dollar amount of the disbursement, plus interest at the actual earnings rate but not less than zero.

(6) No disbursement shall be made from the Prefunding Plan which exceeds the balance in Employer's Prefunding Account.

G. Costs of Administration

Employer shall pay its share of the costs of administration of the Prefunding Plan, as determined by the Board.

H. Termination of Employer Participation in Prefunding Plan

(1) The Board may terminate Employer's participation in the Prefunding Plan if:

(a) Employer gives written notice to the Board of its election to terminate;

(b) The Board finds that Employer fails to satisfy the terms and conditions of this Agreement or of the Board's rules or regulations.

(2) If Employer's participation in the Prefunding Plan terminates for any of the foregoing reasons, all assets in Employer's Prefunding Account shall remain in the Prefunding Plan, except as otherwise provided below, and shall continue to be invested and accrue income as provided in Paragraph D.

(3) After Employer's participation in the Prefunding Plan terminates, Employer may not make contributions to the Prefunding Plan.

(4) After Employer's participation in the Prefunding Plan terminates, disbursements from Employer's Prefunding Account may continue upon Employer's instruction or otherwise in accordance with the terms of this Agreement.

(5) After the Employer's participation in the Prefunding Plan terminates, the governing body of the Employer may request either:

(a) A trustee to trustee transfer of the assets in Employer's Prefunding Account; provided that the Board shall have no obligation to make such transfer unless the Board determines that the transfer will satisfy applicable requirements of the Internal Revenue Code, other law and accounting standards, and the Board's fiduciary duties. If the Board determines that the transfer will satisfy these requirements, the Board shall then have one hundred fifty (150) days from the date of such determination to effect the transfer. The amount to be transferred shall be the amount in the Employer's Prefunding Account as of the date of the transfer (the "transfer date") and shall include investment earnings up to an investment earnings allocation date preceding the transfer date. In no event shall the investment earnings allocation date precede the transfer date by more than 150 days.

(b) A disbursement of the assets in Employer's Prefunding Account; provided that the Board shall have no obligation to make such disbursement unless the Board determines that, in compliance with the Internal Revenue Code, other law and accounting standards, and the Board's fiduciary duties, all of Employer's obligations for payment of post-employment health care benefits and other post-employment benefits and reasonable administrative costs of the Board have been satisfied. If the Board determines that the disbursement will satisfy these requirements, the

Board shall then have one hundred fifty (150) days from the date of such determination to effect the disbursement. The amount to be disbursed shall be the amount in the Employer's Prefunding Account as of the date of the disbursement (the "disbursement date") and shall include investment earnings up to an investment earnings allocation date preceding the disbursement date. In no event shall the investment earnings allocation date precede the disbursement date by more than 150 days.

(6) After Employer's participation in the Prefunding Plan terminates and at such time that no assets remain in Employer's Prefunding Account, this Agreement shall terminate.

(7) If, for any reason, the Board terminates the Prefunding Plan, the assets in Employer's Prefunding Account shall be paid to Employer after retention of (i) amounts sufficient to pay post-employment health care benefits and other post-employment benefits to annuitants for current and future annuitants described by the employer's current substantive plan (as that term is used in GASB OPEB Standards), and (ii) amounts sufficient to pay reasonable administrative costs of the Board.

(8) If Employer ceases to exist but Employer's Prefunding Plan continues to exist and if no provision has been made by Employer for ongoing payments to pay post-employment health care benefits and other post-employment benefits to annuitants for current and future annuitants, the Board is authorized to and shall appoint a third party administrator to carry out Employer's Prefunding Plan. Any and all costs associated with such appointment shall be paid from the assets attributable to contributions by Employer.

(9) If Employer should breach the representation and warranty set forth in Paragraph A., the Board shall take whatever action it deems necessary to preserve the tax-exempt status of the Prefunding Plan.

I. General Provisions

(1) Books and Records.

Employer shall keep accurate books and records connected with the performance of this Agreement. Employer shall ensure that books and records of subcontractors, suppliers, and other providers shall also be accurately maintained. Such books and records shall be kept in a secure location at the Employer's office(s) and shall be available for inspection and copying by CalPERS and its representatives.

(2) Audit.

(a) During and for three years after the term of this Agreement, Employer shall permit the Bureau of State Audits, CalPERS, and its authorized

representatives, and such consultants and specialists as needed, at all reasonable times during normal business hours to inspect and copy, at the expense of CalPERS, books and records of Employer relating to its performance of this Agreement.

(b) Employer shall be subject to examination and audit by the Bureau of State Audits, CalPERS, and its authorized representatives, and such consultants and specialists as needed, during the term of this Agreement and for three years after final payment under this Agreement. Any examination or audit shall be confined to those matters connected with the performance of this Agreement, including, but not limited to, the costs of administering this Agreement. Employer shall cooperate fully with the Bureau of State Audits, CalPERS, and its authorized representatives, and such consultants and specialists as needed, in connection with any examination or audit. All adjustments, payments, and/or reimbursements determined to be necessary by any examination or audit shall be made promptly by the appropriate party.

(3) Notice.

(a) Any notice, approval, or other communication required or permitted under this Agreement will be given in the English language and will be deemed received as follows:

1. Personal delivery. When personally delivered to the recipient. Notice is effective on delivery.

2. First Class Mail. When mailed first class to the last address of the recipient known to the party giving notice. Notice is effective three delivery days after deposit in a United States Postal Service office or mailbox.

3. Certified mail. When mailed certified mail, return receipt requested. Notice is effective on receipt, if delivery is confirmed by a return receipt.

4. Overnight Delivery. When delivered by an overnight delivery service, charges prepaid or charged to the sender's account, Notice is effective on delivery, if delivery is confirmed by the delivery service.

5. Telex or Facsimile Transmission. When sent by telex or fax to the last telex or fax number of the recipient known to the party giving notice. Notice is effective on receipt, provided that (i) a duplicate copy of the notice is promptly given by first-class or certified mail or by overnight delivery, or (ii) the receiving party delivers a written

confirmation of receipt. Any notice given by telex or fax shall be deemed received on the next business day if it is received after 5:00 p.m. (recipient's time) or on a nonbusiness day.

6. E-mail transmission. When sent by e-mail using software that provides unmodifiable proof (i) that the message was sent, (ii) that the message was delivered to the recipient's information processing system, and (iii) of the time and date the message was delivered to the recipient along with a verifiable electronic record of the exact content of the message sent.

Addresses for the purpose of giving notice are as shown in Paragraph B.(1) of this Agreement.

(b) Any correctly addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified shall be deemed effective as of the first date that said notice was refused, unclaimed, or deemed undeliverable by the postal authorities, messenger or overnight delivery service.

(c) Any party may change its address, telex, fax number, or e-mail address by giving the other party notice of the change in any manner permitted by this Agreement.

(d) All notices, requests, demands, amendments, modifications or other communications under this Agreement shall be in writing. Notice shall be sufficient for all such purposes if personally delivered, sent by first class, registered or certified mail, return receipt requested, delivery by courier with receipt of delivery, facsimile transmission with written confirmation of receipt by recipient, or e-mail delivery with verifiable and unmodifiable proof of content and time and date of sending by sender and delivery to recipient. Notice is effective on confirmed receipt by recipient or 3 business days after sending, whichever is sooner.

(4) Survival

All representations, warranties, and covenants contained in this Agreement, or in any instrument, certificate, exhibit, or other writing intended by the parties to be a part of their Agreement shall survive the termination of this Agreement until such time as all amounts in Employer's Prefunding Account have been disbursed.

(5) Waiver

No waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of this Agreement shall be effective unless it is in writing and

signed by the party waiving the breach, failure, right, or remedy. No waiver of any breach, failure, right, or remedy shall be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor shall any waiver constitute a continuing waiver unless the writing so specifies.

(6) Necessary Acts, Further Assurances

The parties shall at their own cost and expense execute and deliver such further documents and instruments and shall take such other actions as may be reasonably required or appropriate to evidence or carry out the intent and purposes of this Agreement.

A majority vote of Employer's Governing Body at a public meeting held on the 19th day of the month of September in the year 2018, authorized entering into this Agreement.

Signature of the Presiding Officer: _____

Printed Name of the Presiding Officer: _____

Name of Governing Body: Board of Directors

Name of Employer: Citrus Heights Water District

Date: September 19, 2018

BOARD OF ADMINISTRATION
CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

BY_____
ARNITA PAIGE
CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

To be completed by CalPERS
The effective date of this Agreement is: _____

ATTACHMENT 2
Resolution 16-2018

CITRUS HEIGHTS WATER DISTRICT
RESOLUTION NO. 16-2018

RESOLUTION OF THE BOARD OF DIRECTORS
ELECTING TO PARTICIPATE IN THE PREFUNDING PLAN ALSO KNOWN AS THE CALIFORNIA EMPLOYERS' RETIREEE BENEFIT TRUST PROGRAM (CERBT), ADOPTING THE AGREEMENT TO PREFUND OTHER POST-EMPLOYMENT BENEFITS THROUGH CALPERS, AND EXECUTION OF RELATED DOCUMENTS

WHEREAS, the Citrus Heights Water District (District) provides health insurance benefits to retirees, also known as Other Post-Employment Benefits (OPEB), and historically funded its OPEB on a "pay-as-you-go" basis; and

WHEREAS, on November 8, 2017 the Board of Directors of the District authorized the accelerated payment of the District's OPEB Unfunded Actuarial Accrued Liability (UAAL); and

WHEREAS, the California Public Employees' Retirement System (CalPERS) has established the California Employers' Retiree Benefit Trust (CERBT) to manage OPEB funds for public agencies through an irrevocable trust, in compliance with Internal Revenue Code Section 115.

WHEREAS, staff was directed to return to a future Board Meeting for approval of the selection of CERBT to manage the District's OPEB funds, and authorization to execute documents required to establish the trust; and

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of Citrus Heights Water District as follows:

SECTION 1. The Board of Directors does hereby approve the CERBT Agreement and Election of the District to Prefund Other Post-Employment Benefits through CalPERS.

SECTION 2. The Board of Directors does hereby delegate the General Manager, or the General Manager's designee, authority to request on behalf of the District eligible disbursements from the CERBT as needed and to certify as to the purpose for which the disbursed funds will be used.

SECTION 3. The Board of Directors does hereby authorize the General Manager, or designee, to execute all documents to facilitate the funding, investment management, and administration of the City's Other Post-Employment Benefits.

PASSED, APPROVED, AND ADOPTED by the Board of Directors of the CITRUS HEIGHTS WATER DISTRICT this 19th day of September 2018 by the following vote, to wit:

AYES: Directors:
NOES: Directors:
ABSTAIN: Directors:
ABSENT: Directors:

RAYMOND RIEHLE, President
Board of Directors
Citrus Heights Water District

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of Resolution 16-2018 adopted by the Board of Directors of Citrus Heights Water District at its regular meeting held September 19, 2018.

CHRISTOPHER CASTRUITA
Chief Board Clerk Citrus Heights Water District

ATTACHMENT 3
Delegation of Authority Form

DELEGATION OF AUTHORITY
TO REQUEST DISBURSEMENTS

RESOLUTION
OF THE

Board of the Directors

(GOVERNING BODY)

OF THE

Citrus Heights Water District

(NAME OF EMPLOYER)

The Board of Directors (GOVERNING BODY) delegates to the incumbents in the positions of General Manager (TITLE) and Administrative Services Manager (TITLE) and/or Assessor Collector (TITLE) authority to request on behalf of the Employer disbursements from the Other Post Employment Prefunding Plan and to certify as to the purpose for which the disbursed funds will be used.

By _____

Title President

Witness _____

Date _____

AGENDA ITEM: S-1

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT	:	PROJECT 2030 WATER MAIN REPLACEMENT STUDY – 30 PERCENT COMPLETION UPDATE
STATUS	:	Information Item
REPORT DATE	:	September 4, 2018
PREPARED BY	:	Missy Pieri, Engineering Manager/District Engineer

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The Project 2030 Leadership Team, Customer Advisory Committee Chair Jenna Moser, Engineering Manager Missy Pieri, Harris & Associates Project Manager Roger Kohne, and Laura Mason-Smith of Mason-Smith Success Strategies will provide an update on the status of the Project 2030 Water Main Replacement Study. This update is being provided at the 30% completion mark of the Study and will highlight previous activities and work completed, current status and next steps.

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT	: DISCUSSION AND POSSIBLE ACTION TO FILL VACANCIES ON THE CUSTOMER ADVISORY COMMITTEE
STATUS	: Action Item
REPORT DATE	: September 6, 2018
PREPARED BY	: Christopher Castruita, Management Services Supervisor/Chief Board Clerk

OBJECTIVE:
Consider appointing a replacement to a vacancy on the Customer Advisory Committee, appointing alternates to fill prospective vacancies, and ratifying the appointment of Chair and Vice Chair.

BACKGROUND AND ANALYSIS:
Resolution 04-2018 created a 23 seat Customer Advisory Committee made up of 19 voting members and four ex-officio members, including:

1. 16 seats for residential customers located throughout the CHWD service area;
2. Three seats representing commercial interests from the Citrus Heights Chamber of Commerce, the Sunrise MarketPlace, and the Auburn Boulevard Business Association, respectively; and
3. Four ex-officio seats for the San Juan Unified School District, the Sunrise Parks and Recreation District, Sylvan Cemetery District, and the City of Citrus Heights.

In the instance that a member resigns, the Resolution states that "CHWD shall take any steps necessary to fill the vacancy." It also directs the CAC to nominate a Chairperson and Vice Chair "whose appointments to this office shall be ratified by the Board of Directors".

At their May 29 Meeting, the Citrus Heights Water District (CHWD) Customer Advisory Committee (CAC) nominated CAC residential members Jenna Moser and David Wheaton as the CAC Chair and Vice Chair, respectively. Mr. Wheaton later submitted nomination papers for the CHWD Division Three Board seat to succeed Director Al Dains, and on August 31, 2018 the Sacramento County Voter Registration and Elections Office notified CHWD that Mr. Wheaton would be appointed in lieu of election to fill the Board seat for Division Three. As the Board of Directors has not designated a voting seat on the Committee for a Board Member, it follows that the seat occupied by incoming CHWD Board Member Wheaton would become vacant.

On August 27, 2018 CAC member Colleen Sloan, a residential member from Neighborhood Area 8, submitted a letter of resignation to staff, citing "personal reasons that [she] cannot control" leaving her unable to meet the responsibilities to perform on the CAC (see attachment 1).

Filling Vacant CAC Seats
With a vacancy from the resignation of Colleen Sloan, and a second vacancy projected in December, staff requests the appointment of two CAC member and two alternates. Attachment 2 contains the application materials for the 23 remaining residential applicants from the initial CAC application period as well as a map noting the general location of each applicant's residence. Staff will be ready to provide suggestions for these positions at the September 19 Board Meeting should the Board wish to receive such input. Staff recommends that all candidates selected agree to view videos of the previous CAC meetings as a condition of appointment to the Committee.

Selection of CAC Vice Chair

Mr. Wheaton is scheduled to be seated as the new CHWD Division 3 Director at the December 19 Board Meeting. This would occur after the December 11 CAC Meeting. In order to reduce confusion during Mr. Wheaton's transition off the CAC, staff requests that the Board ratify the appointment of Chair, Vice Chair, and a successor to the Vice Chair's position upon his appointment to the Board of Directors. In particular, staff recommends the candidate who received the third highest number of votes for Chair at the May 29 CAC meeting, Mr. Richard Moses.

RECOMMENDATION:

Appoint replacements to two vacancies on the Customer Advisory Committee, select and appoint two alternates to fill prospective vacancies, and ratify the appointment of Chair and Vice Chair.

ATTACHMENT:

1. Resolution 04-2018, establishing a Customer Advisory Committee
2. Letter of Resignation from Mrs. Colleen Sloan
3. Updated Customer Advisory Committee Application Packet
4. Mr. Richard Moses Customer Advisory Committee Application

ACTION:

Moved by Director _____, Seconded by Director _____, Carried _____

ATTACHMENT 1

Resolution 04-2018, establishing a Customer Advisory Committee

CITRUS HEIGHTS WATER DISTRICT
RESOLUTION NO. 04-2018

RESOLUTION OF THE BOARD OF DIRECTORS
ESTABLISHING A CUSTOMER ADVISORY COMMITTEE

WHEREAS, the Citrus Heights Water District (CHWD) is an Irrigation District formed pursuant to the California Irrigation District Law (California Water Code, section 20500 et seq.); and

WHEREAS, CHWD provides drinking water to an estimated service area population of 67,000 customers via approximately 19,600 water service connections in Sacramento and Placer Counties and has responsibility for operating, maintaining and planning for the replacement of its water assets, including water mains; and

WHEREAS, CHWD anticipates that, beginning in 2030, it will be necessary to replace many aging water mains, the majority of which were installed between 1960 and 1985 by private developers and later became donated assets to CHWD; and

WHEREAS, on October 18, 2017, the CHWD Board of Directors approved an agreement with Harris & Associates for the Project 2030 Water Main Replacement Study, known as "Project 2030"; and

WHEREAS, Project 2030 will include a public engagement and stakeholder outreach process in which a Project 2030 Customer Advisory Committee focus group (the "CAC") will consider various alternatives, funding options and recommendations and will develop a formal recommendation for CHWD's water main replacement strategy for consideration by the Board of Directors, and

WHEREAS, the CAC also will provide further stakeholder input on the development of the Meter Replacement Program, which is a multi-agency effort to develop strategies for the regular replacement of water meters expected to start before the end of 2018; and

WHEREAS, Project 2030 is projected to take 18 months and the CAC would be empaneled for the duration of that time and consist of 24 members; and

WHEREAS, on December 20, 2017, the Board of Directors selected 17 applicants for appointment to the CAC and agreed by consensus to expand the appointees to 19 members to include one Citrus Heights Chamber of Commerce representative and one Sunrise MarketPlace representative to represent large commercial accounts, and to provide three additional ex-officio seats for representatives of the San Juan Unified School District, the Sunrise Parks and Recreation District, and the Sylvan Cemetery District; and

WHEREAS on March 21, 2018, the Board of Directors agreed to revise the appointment

of one applicant to serve as the Auburn Boulevard Business Association representative, and to provide an additional ex-officio seat for a representative of the City of Citrus Heights; and

WHEREAS, the CAC may be called upon by the Board of Directors or staff to provide further stakeholder input on strategic programs of the District; and

WHEREAS, the Board of Directors wishes to establish the CAC and governing principles that will guide the CAC's activities.

NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE CITRUS HEIGHTS WATER DISTRICT DOES RESOLVE AS FOLLOWS:

Section 1. Establishment and Purpose

The Project 2030 Customer Advisory Committee (the "CAC") is hereby established as set forth herein. The general purpose of the CAC is to consider various alternatives, funding options and recommendations to develop a formal recommendation for CHWD's water main replacement strategy for consideration by the CHWD Board of Directors. The CAC also will provide stakeholder input on the development of the multi-agency Meter Replacement Program effort to develop strategies for the regular replacement of water meters expected to start before the end of 2018. The CAC will further provide input on other CHWD matters as requested by the Board of Directors or staff.

Section 2. Membership.

The CAC shall include 19 voting members, appointed as follows:

A. Residential
Sixteen (16) members appointed by the CHWD Board of Directors.

B. Significant Commercial Accounts
One (1) Citrus Heights Chamber of Commerce representative.
One (1) Sunrise MarketPlace representative.
One (1) Auburn Boulevard Business Association representative.

C. Ex-Officio Members – Institutional
One (1) representative from San Juan Unified School District.
One (1) representative from Sunrise Parks and Recreation District.
One (1) representative from Sylvan Cemetery District.
One (1) representative from the City of Citrus Heights.

In the event that a member resigns from the CAC, that member shall promptly notify CHWD and CHWD shall take any steps necessary fill the vacancy.

Section 3. Term Of Membership.

Members of the CAC shall serve at a minimum during the duration of the Project 2030 study period.

Section 4. Termination of Membership.

The Board of Directors may dismiss a CAC member for no reason or for any of the following reasons:

A. One or more unexcused absences from CAC meetings.
B. Violation of the Ralph M. Brown Act.
C. Violation of applicable provisions within District Policy No. 2100 – Standards of Conduct for Directors and Officers.

Section 5. Officers and Subcommittees.

The CAC shall nominate a Chairperson and an Alternate Chairperson, whose appointments to this office shall be ratified by the Board of Directors. The Chairperson shall call meetings to order, shall have all the powers and duties of the presiding officer as described in the standardized rules of parliamentary procedure determined to be applicable by CHWD, and shall perform such other duties as may from time to time be prescribed by CHWD or the Board of Directors. The Alternate Chairperson shall have all of the powers and duties of the Chairperson in the event the Chairperson is absent or unable to act.

The CAC may create and appoint members of the CAC to subcommittees.

Section 6. Meetings.

The CHWD General Manager or the General Manager's designee shall determine the place and times for meetings of the CAC, and shall administer the CAC's activities and serve as a CAC liaison with support from other CAC staff as may be necessary. All meetings shall comply with California's open meetings law for public agencies (the Ralph M. Brown Act, Government Code Sections 54950 et seq.).

Section 7. Quorum and Voting.

A quorum of the CAC shall consist of a majority of the CAC's voting membership. Any necessary decisions of the CAC shall, whenever possible, be determined by consensus. If consensus cannot be reached, any necessary decisions shall be determined by majority vote.

Section 8. Responsibilities of the CAC.

The CAC shall have the responsibilities as provided in this section and such other duties as the Board of Directors may from time to time decide:

A. Diligently review all documents and materials provided by the CHWD General Manager or the General Manager's designee relevant to the purposes referenced in Section 1.
B. Serve as a forum for public input and feedback on issues related to the purposes referenced in Section 1.
C. Develop a timely written recommendation for consideration by the Board of Directors for CHWD's water main replacement strategy.
D. Provide stakeholder input on the development of the Meter Replacement

Program, referenced in Section 1.

E. Abide by all relevant policies and procedures in the District Policy No. 2100 – Standards of Conduct for Directors and Officers, including participating in any training and making any disclosures that CHWD deems necessary to ensure compliance with all laws.

Any and all feedback, advice or other actions taken by the CAC shall be deemed to be advisory only and shall not be binding upon CHWD or the Board of Directors. Any activities of the CAC shall be performed as provided for in this Resolution and in compliance with all laws. This Resolution supersedes Resolution No. 01-2018, which is of no further force or effect.

ADOPTED this 21st day of March, 2018

AYES: Board Members- Riehle, Sheehan, Dains

NOES: Board Members-

ABSTAIN: Board Members-

ABSENT: Board Members-

RAYMOND RIEHLE, President
Board of Directors
Citrus Heights Water District

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of Resolution 04-2018 adopted by the Board of Directors of Citrus Heights Water District at its regular meeting held March 21, 2018.

CHRISTOPHER CASTRUITA, Chief
Board Clerk
Citrus Heights Water District

ATTACHMENT 2

Letter of Resignation from Mrs. Colleen Sloan

From: Colleen Sloan
To: Christopher Castruita
Subject: Re: Reminder- Upcoming CHWD Customer Advisory Committee Meeting
Date: Monday, August 27, 2018 9:12:46 PM

Chris, per our conversation today, it is with regret that I have to resign my position on the Customer Advisory Committee. Due to personal reasons that I can't control I will be unable to perform the duties of the committee.

Colleen Sloan

On August 27, 2018, at 6:40 PM, Christopher Castruita <ccastruita@chwd.org> wrote:

ATTACHMENT 3

Updated Customer Advisory Committee
Application Packet

CUSTOMER ADVISORY COMMITTEE APPLICANTS

NEIGHBORHOOD AREA 2

No.	Last	First	Address	Neighborhood Area	Division	Late?
1	Bohlke	Ray	[redacted]	2	3	
2	Cartwright	Deborah	[redacted]	2	3	
3	Catalano	Patti	[redacted]	2	3	
4	Fraser	Margene	[redacted]	2	3	
5	Wheaton	David	[redacted]	2	3	

NEIGHBORHOOD AREA 3

No.	Last	First	Address	Neighborhood Area	Division	Late?
6	Crow	Steven	[redacted]	3	3	

NEIGHBORHOOD AREA 4

No.	Last	First	Address	Neighborhood Area	Division	Late?
7	Berg	Kimberly	[redacted]	4	1	

NEIGHBORHOOD AREA 6

No.	Last	First	Address	Neighborhood Area	Division	Late?
8	Goble	Michael	[redacted]	6	3	
9	Kitts	David	[redacted]	6	3	
10	Moore	Richard	[redacted]	6	3	
11	Mortensen	Caroll	[redacted]	6	3	

NEIGHBORHOOD AREA 7

No.	Last	First	Address	Neighborhood Area	Division	Late?
12	Calkins	Ronald	[redacted]	7	2	

NEIGHBORHOOD AREA 8

No.	Last	First	Address	Neighborhood Area	Division	Late?
13	Carr	Lynn	[redacted]	8	3	
14	Monteton	James	[redacted]	8	3	
15	Moses	Richard	[redacted]	8	3	
16	Perozzi	Kevin	[redacted]	8	3	
17	Sloan	Colleen	[redacted]	8	3	Yes

NEIGHBORHOOD AREA 9

No.	Last	First	Address	Neighborhood Area	Division	Late?
18	Blair	Russell	[redacted]	9	2	
19	Schulz	Pamela	[redacted]	9	2	

NEIGHBORHOOD AREA 10

No.	Last	First	Address	Neighborhood Area	Division	Late?
20	McQuagge	JoAnn	[redacted]	10	1	
21	Middleton	Porsche	[redacted]	10	1	
22	Paige	David	[redacted]	10	1	
23	Pfaff	Aimee	[redacted]	10	1	
24	Utzig	Alan	[redacted]	10	1	
25	Walker	Debra	[redacted]	10	1	

NEIGHBORHOOD AREA 11

No.	Last	First	Address	Neighborhood Area	Division	Late?
26	Guthrie	Suzanne	[redacted]	11	2	
27	Moser	Jenna	[redacted]	11	1	
28	Shull	Treston	[redacted]	11	1	
29	Steele	Troy	[redacted]	11	1	
30	Wright	Larry	[redacted]	11	1	

FAIR OAKS NORTH

No.	Last	First	Address	Neighborhood Area	Division	Late?
31	MacTaggart	Doug	[redacted]	Fair Oaks North	2	Yes

FAIR OAKS NORTHWEST

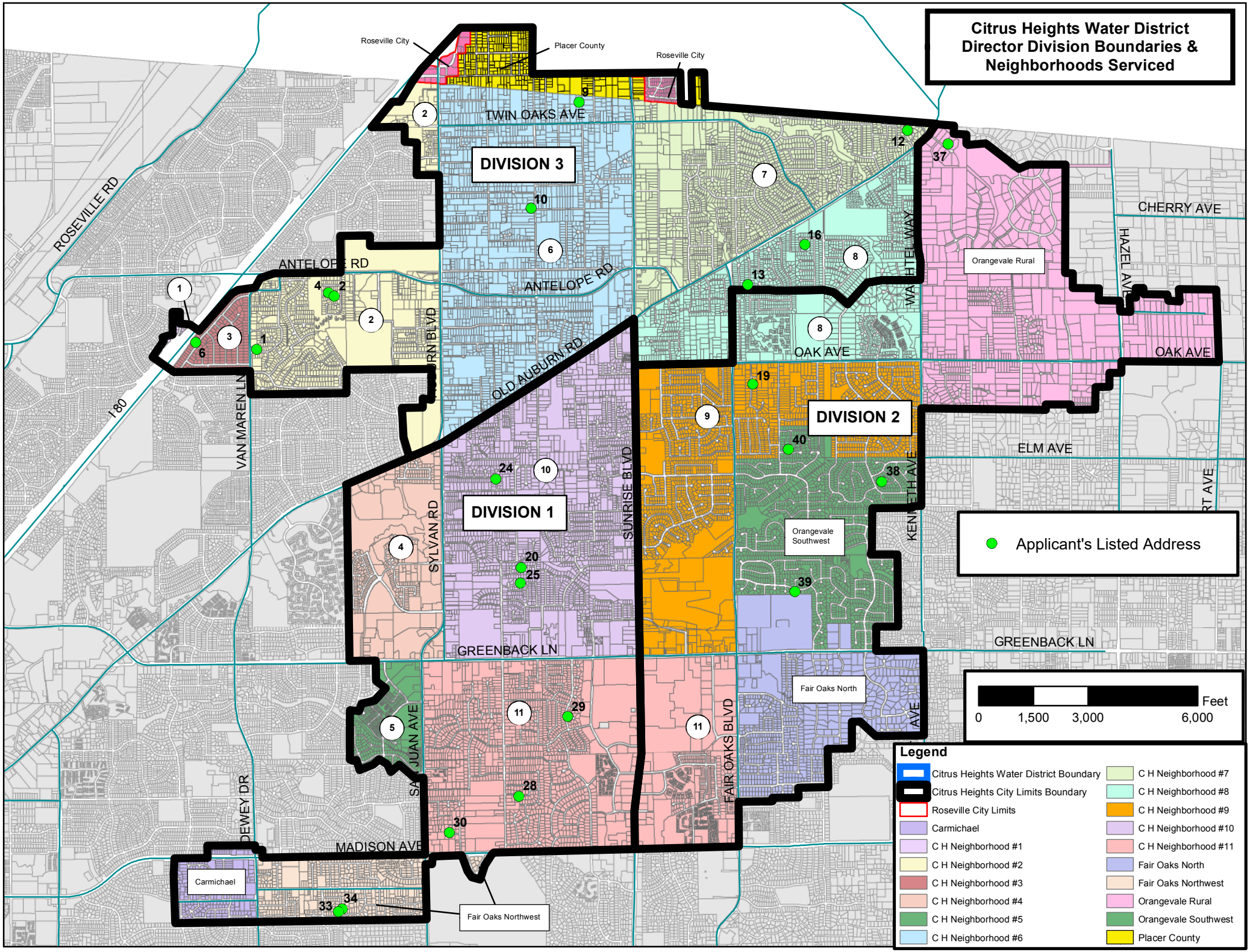
No.	Last	First	Address	Neighborhood Area	Division	Late?
32	Beyers	Julie	[redacted]	Fair Oaks Northwest	1	Yes
33	Hanson	Don	[redacted]	Fair Oaks Northwest	2	
34	Scott	Hal	[redacted]	Fair Oaks Northwest	1	

ORANGEVALE RURAL

No.	Last	First	Address	Neighborhood Area	Division	Late?
35	Brunberg	Sharon	[redacted]	Orangevale Rural	2	Yes
36	Siddiqui	Javed	[redacted]	Orangevale Rural	2	Yes
37	Kowaleski	Richard	[redacted]	Orangevale Rural	2	Yes

ORANGEVALE SOUTHWEST

No.	Last	First	Address	Neighborhood Area	Division	Late?
38	Gomez	Paul	[redacted]	Orangevale Southwest	3	
39	Johnson	Andrew	[redacted]	Orangevale Southwest	2	
40	Martinez	Bren	[redacted]	Orangevale Southwest	2	
41	Pinard	Peg	[redacted]	Orangevale Southwest	2	


Citrus Heights Water District
Director Division Boundaries &
Neighborhoods Serviced
DIVISION 1
DIVISION 2
DIVISION 3
Roseville City
Placer County
Roseville City
TWIN OAKS AVE
ROSEVILLE RD
ANTELOPE RD
ANTELOPE RD
OLD AUBURN RD
OAK AVE
OAK AVE
CHERRY AVE
HAZEL AVE
ELM AVE
GREENBACK LN
GREENBACK LN
MADISON AVE
I-80
VAN MAREN LN
SYLVAN RD
SUNRISE BLVD
FAIR OAKS BLVD
SAN JUAN AVE
DEWEY DR
Orangevale Rural
Orangevale Southwest
Fair Oaks North
Fair Oaks Northwest
Carmichael
Applicant's Listed Address
0
1,500
3,000
6,000
Feet
Legend
Citrus Heights Water District Boundary
Citrus Heights City Limits Boundary
Roseville City Limits
Carmichael
C H Neighborhood #1
C H Neighborhood #2
C H Neighborhood #3
C H Neighborhood #4
C H Neighborhood #5
C H Neighborhood #6
C H Neighborhood #7
C H Neighborhood #8
C H Neighborhood #9
C H Neighborhood #10
C H Neighborhood #11
Fair Oaks North
Fair Oaks Northwest
Orangevale Rural
Orangevale Southwest
Placer County

Neighborhood Area 2

CITRUS HEIGHTS WATER DISTRICT

No. 1

CUSTOMER ADVISORY COMMITTEE APPLICATION

PROJECT 2030
WATER MAIN REPLACEMENT

METER REPLACEMENT PROGRAM
ACCURACY + EFFICIENCY + TECHNOLOGY

WHAT?

We are seeking applications from CHWD customers to participate in a Customer Advisory Committee (CAC). The CAC will provide input into the District's long term plans to provide safe and reliable water to its customers.

WHO?

The CAC will work with a team of District staff and technical consultants to plan for District-wide replacement of water mains and water meters. The financial implication of these studies is significant.

The CAC will be comprised of 17 members from a variety of backgrounds and neighborhoods across the District who will attend presentations on Water Main and Water Meter Replacement options at a series of meetings. The District will select committee members to ensure adequate representation of the customer base. We know your time is important. Meetings will be held in the early evening, have agendas and will be less than 2 hours. The CAC will be charged with making important recommendations to the CHWD Board of Directors concerning strategies to replace water mains and water meters.

WHY?

Your participation will help shape Citrus Heights Water District for the next generation!

APPLY

To apply to be a member of the Customer Advisory Committee, please fill out the form below:

Please mail the completed form to:
CHWD
P.O. Box 286
Citrus Heights, CA 95610-0286

APPLICATIONS ARE DUE NO LATER THAN MONDAY, OCTOBER 23, 2017 BY 11:59:59 PM Pacific Time. CAC MEMBERS WILL BE SELECTED AND APPROVED AT THE NOVEMBER 15, 2017 CHWD BOARD MEETING.

First Name Ray

Last Name Bohlke

Mailing Address

Email Address

Phone Number

Occupation or Professional Background

- ❑ Agriculture/Food Processing
- ❑ Banking/Finance/Accounting
- ❑ Business Owner
- ❑ Construction Industry
- ❑ Engineer (Civil, Electrical, Mechanical)
- ❑ Healthcare
- ❑ Homemaker
- ❑ Information Technology
- ❑ Public Safety-Fire
- ❑ Public Safety-Other
- ❑ Public Employee
- ■ Retired
- ❑ Other

How long have you been a CHWD customer?

❑ 0-10 Years ❑ 10-20 Years ❑ 20-30 Years ■ 30 Years or more

OPTIONAL:
On the back of this form, in 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

I retired from Sacramento County after 23 years as a Traffic Signal Supervisor. My last two years was sole manager of the Transportation Operations Database. I worked with all departments and all levels of staff and was the "problem solver" for all users of the database. I think I have a lot of experience to work well on the CAC.

Customer Advisory Committee Application

Date:11/12/2017 3:28:10 PM No.2

Name:

Cartwright, Deborah

Address

[redacted] Citrus Heights, CA 95621

Email: [redacted]

Phone Number: [redacted]

Occupation:

Banking/Finance/Accounting

How long have you been a CHWD customer?

0-10 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

I want to join the committee because I want to help make a difference in our community. I have some previous experience financing community water and waste programs which will make understanding the various options and financial implications clearer.

CITRUS HEIGHTS WATER DISTRICT

No. 4

CUSTOMER ADVISORY COMMITTEE APPLICATION

PROJECT 2030
WATER MAIN REPLACEMENT

METER REPLACEMENT PROGRAM
ACCURACY + EFFICIENCY + TECHNOLOGY

WHAT?

We are seeking applications from CHWD customers to participate in a Customer Advisory Committee (CAC). The CAC will provide input into the District's long term plans to provide safe and reliable water to its customers.

WHO?

The CAC will work with a team of District staff and technical consultants to plan for District-wide replacement of water mains and water meters. The financial implication of these studies is significant.

The CAC will be comprised of 17 members from a variety of backgrounds and neighborhoods across the District who will attend presentations on Water Main and Water Meter Replacement options at a series of meetings. The District will select committee members to ensure adequate representation of the customer base. We know your time is important. Meetings will be held in the early evening, have agendas and will be less than 2 hours. The CAC will be charged with making important recommendations to the CHWD Board of Directors concerning strategies to replace water mains and water meters.

WHY?

Your participation will help shape Citrus Heights Water District for the next generation!

APPLY

To apply to be a member of the Customer Advisory Committee, please fill out the form below:

Please mail the completed form to:
CHWD
P.O. Box 286
Citrus Heights, CA 95610-0286

APPLICATIONS ARE DUE NO LATER THAN MONDAY, OCTOBER 23, 2017 BY 11:59:59 PM Pacific Time. CAC MEMBERS WILL BE SELECTED AND APPROVED AT THE NOVEMBER 15, 2017 CHWD BOARD MEETING.

First Name Margene

Last Name Fraser

Mailing Address Citrus Heights, CA 95621

Email Address

Phone Number

Occupation or Professional Background

- ☒ Agriculture/Food Processing
- ☐ Banking/Finance/Accounting
- ☐ Business Owner
- ☐ Construction Industry
- ☐ Engineer (Civil, Electrical, Mechanical)
- ☒ Healthcare
- ☒ Homemaker
- ☐ Information Technology
- ☐ Public Safety-Fire
- ☐ Public Safety-Other
- ☐ Public Employee
- ☒ Retired
- ☒ Other San Joaquin Co. 1980 General Plan Review.

How long have you been a CHWD customer?

☐ 0-10 Years ☒ 10-20 Years ☐ 20-30 Years ☐ 30 Years or more

OPTIONAL:
On the back of this form, in 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Water and its uses became important to me as a child helping my father irrigate our orchard.

At a time when few people gave a second thought to water I was aware of the sometimes urgent need to have it. I believe that it is our most important commodity.

Neighborhood Area 3

Customer Advisory Committee Application

Date:11/7/2017 10:26:11 AM No.6

Name:

Crow,Steven

Address

[redacted] Citrus Heights, CA 95621

Email: [redacted]

Phone Number: [redacted]

Occupation:

Agriculture/Food Processing

How long have you been a CHWD customer?

0-10 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Neighborhood Area 6

We are seeking applications from CHWD customers to participate in a Customer Advisory Committee (CAC). The CAC will provide input into the District's long term plans to provide safe and reliable water to its customers.

WHO?

No. 9

The CAC will work with a team of District staff and technical consultants to plan for District-wide replacement of water mains and water meters. The financial implication of these studies is significant.

The CAC will be comprised of 17 members from a variety of backgrounds and neighborhoods across the District who will attend presentations on Water Main and Water Meter Replacement options at a series of meetings. The District will select committee members to ensure adequate representation of the customer base. We know your time is important. Meetings will be held in the early evening, have agendas and will be less than 2 hours. The CAC will be charged with making important recommendations to the CHWD Board of Directors concerning strategies to replace water mains and water meters.

WHY?

Your participation will help shape Citrus Heights Water District for the next generation!

APPLY

To apply to be a member of the Customer Advisory Committee, please fill out the form below:

Please mail the completed form to:
CHWD
P.O. Box 286
Citrus Heights, CA 95610-0286

APPLICATIONS ARE DUE NO LATER THAN MONDAY, NOVEMBER 13, 2017 BY 11:59:59 PM Pacific Time. CAC MEMBERS WILL BE SELECTED AND APPROVED AT THE JANUARY 17, 2018 CHWD BOARD MEETING.

First Name David

Last Name Kitts

Mailing Address

Email Address

Phone Number

Occupation or Professional Background

- ☐ Agriculture/Food Processing
- ☐ Banking/Finance/Accounting
- ☐ Business Owner
- ☐ Construction Industry
- ☒ Engineer (Civil, Electrical, Mechanical)
- ☐ Healthcare
- ☐ Homemaker
- ☐ Information Technology
- ☐ Public Safety-Fire
- ☐ Public Safety-Other
- ☐ Public Employee
- ☒ Retired
- ☐ Other

How long have you been a CHWD customer?

- ☒ 0-10 Years
- ☐ 10-20 Years
- ☐ 20-30 Years
- ☐ 30 Years or more

OPTIONAL:
On the back of this form, in 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

[redacted] [redacted]

experience in power utility, SCADA, Telecom & water treatment experience I believe I can lend some guideance in your expansion projects.

Neighborhood Area 7

Customer Advisory Committee Application

Date:9/28/2017 10:14:04 PM No.12

Name:

Calkins,Ronald

Address

[redacted] Citrus Heights, CA 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Information Technology

How long have you been a CHWD customer?

20-30 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

The CAC offers me the opportunity to work directly with members of the community, networking to develop interests/skills to use as resources which will provide benefit and service to the CHWD long term planning for the safety and reliability of our water.

Neighborhood Area 8

Customer Advisory Committee Application

Date:10/8/2017 4:10:01 PM No.13

Name:

Carr, Lynn

Address

[redacted] Citrus Heights, CA 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Other

How long have you been a CHWD customer?

0-10 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Maintaining clean, accessible water in Citrus Heights, for current and future residents is imperative. It would be my honor to aid in assuring this is so.

Customer Advisory Committee Application

Date:9/29/2017 12:22:42 AM No.16

Name:

Perozzi, Kevin

Address

[redacted] Citrus Heights, CA 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Public Employee

How long have you been a CHWD customer?

10-20 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Neighborhood Area 9

Customer Advisory Committee Application

Date:10/31/2017 3:10:06 AM No.19

Name:

Schulz, Pamela

Address

[redacted] Citrus Heights, CA 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Other

How long have you been a CHWD customer?

20-30 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

I would like to get involved in my city to help make a difference. However, if the meetings are in Monday evenings I won't be able to due to a prior commitment.

Neighborhood Area 10

Customer Advisory Committee Application

Date:10/27/2017 12:47:25 AM No.20

Name:

McQuagge, JoAnn

Address

[redacted] Citrus Heights Ca 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Retired

How long have you been a CHWD customer?

20-30 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Very interested in what's going on in my city and water district.

Customer Advisory Committee Application

Date:11/10/2017 4:20:51 AM No.24

Name:

Utzig, Alan

Address

[redacted] Citrus Heights CA 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Retired

How long have you been a CHWD customer?

30 years or more

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

An opportunity to give something back to our community. In the past, I have participated in several other community organizations and would welcome the opportunity to serve again.

Customer Advisory Committee Application

Date:10/12/2017 5:58:35 PM No.25

Name:

Walker, Debra

Address

[redacted] Citrus Heights, CA 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Healthcare

How long have you been a CHWD customer?

0-10 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

As a new Citrus Heights homeowner (September 2016), I would like to contribute to decisions made in my community that will affect me in the years ahead.

Neighborhood Area 11

Customer Advisory Committee Application

Date:10/8/2017 4:51:14 AM No.28

Name:

Shull, Treston

Address

[redacted] Citrus Heights, CA 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Other

How long have you been a CHWD customer?

0-10 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Customer Advisory Committee Application

Date:10/19/2017 7:21:57 PM No.29

Name:

Steele, Troy

Address

[redacted] Citrus Heights, CA 95610

Email:[redacted]

Phone Number:[redacted]

Occupation:

Public Employee

How long have you been a CHWD customer?

0-10 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Customer Advisory Committee Application

Date:10/21/2017 6:45:33 PM No.30

Name:

Wright, Larry

Address

[redacted] Citrus Heights, CA 95610

Email: [redacted]

Phone Number: [redacted]

Occupation:

Retired

How long have you been a CHWD customer?

30 years or more

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Being Retired from Sales/Mkgtng and Own Business, and Living in CH for 47 yrs enables me to better understand our needs. Retired People need a voice in decisions that effect all of us in CH.

Fair Oaks Northwest Neighborhood

Customer Advisory Committee Application

Date:11/13/2017 10:56:14 PM No.33

Name:

Hanson, Don

Address

[redacted] Fair Oaks, CA 95628

Email: [redacted]

Phone Number: [redacted]

Occupation:

Retired

How long have you been a CHWD customer?

20-30 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Customer Advisory Committee Application

Date:11/13/2017 11:32:43 PM No.34

Name:

Scott, Hal

Address

[redacted] Fair Oaks, CA 95628

Email: [redacted]

Phone Number: [redacted]

Occupation:

Retired

How long have you been a CHWD customer?

30 years or more

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Orangevale Rural Neighborhood

Customer Advisory Committee Application

Date:11/18/2017 9:19:00 AM No.35

Name:

Brunberg, Sharon

Address

[redacted] Orangevale, CA 95662

Email: [redacted]

Phone Number: [redacted]

Occupation:

Business Owner

How long have you been a CHWD customer?

20-30 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Customer Advisory Committee Application

Date:12/05/2017 18:22:00 PM No.37

Name:

Kowaleski, Richard

Address

[redacted]

Email: [redacted]

Phone Number: [redacted]

Occupation:

Engineer (Civil, Electrical, Mechanical)

How long have you been a CHWD customer?

30 years or more

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Engineering and business education (B.S., M.S., M.B.A.) and experience (retired Air Force officer, small business owner). Emeritus engineering faculty, CSUS. Mediator. Community service (Rotary, various community boards and committees). Large lot owner (1.25 acres). Teaching critical thinking at CSUS for their Renaissance Society.

Orangevale Southwest Neighborhood

Customer Advisory Committee Application

Date:8/31/2017 3:26:13 PM No.38

Name:

Gomez, Paul

Address

[redacted] Orangeville, CA 95662

Email: [redacted]

Phone Number: [redacted]

Occupation:

Public Employee

How long have you been a CHWD customer?

0-10 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

Sounds like fun.

Customer Advisory Committee Application

Date:10/26/2017 10:00:29 PM No.39

Name:

Johnson, Andrew

Address

[redacted], Orangevale, California 96552

Email: [redacted]

Phone Number:

Occupation:

Engineer (Civil, Electrical, Mechanical)

How long have you been a CHWD customer?

10-20 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

To contribute and participate as a CHWD customer, engineer, and member of our community concerned with our community receiving and CHWD being able to provide safe water on a reliable water infrastructure system, and that costs to engineer, construct, maintain, and repair the water system are balanced and well-planned.

Customer Advisory Committee Application

Date:9/27/2017 11:14:44 PM No.40

Name:

Martinez, Bren

Address

[redacted] Orangevale, CA 95662

Email: [redacted]

Phone Number: [redacted]

Occupation:

Banking/Finance/Accounting

How long have you been a CHWD customer?

0-10 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

I would like to help in developing and having a say in CHWD policy changes.

ATTACHMENT 4

Mr. Richard Moses Customer Advisory Committee Application

Customer Advisory Committee Application

Date:10/21/2017 7:52:01 PM No.15

Name:

Moses, Richard

Address

[redacted]

Email: [redacted]

Phone Number: [redacted]

Occupation:

Retired

How long have you been a CHWD customer?

10-20 years

OPTIONAL: In 50 words or less, please tell us why you would like to join the Customer Advisory Committee.

The water crisis over the last few years has caught the attention of many Californians. I have developed a growing interest in water quality and water sources. This customer advisory committee sounds like an opportunity for me to gain a better understanding of the situation on a local level and perhaps work on developing solutions to our ongoing water situation.

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT	:	PROPOSED 2019 BUDGETS AND WATER RATE SCHEDULE
STATUS	:	Discussion Item
REPORT DATE	:	September 08, 2018
PREPARED BY	:	Susan K. Sohal, Administrative Services Manager Hilary M. Straus, General Manager

OBJECTIVE:

Review and discuss the draft Operating and Capital Improvement Budgets and proposed water rate schedule for 2019.

SUMMARY:

Presented for consideration are the following recommendations:

- A 2019 Operating Budget of $13.05 million, representing an overall increase of about $899,000, or 7.4% above 2018 authorized budget levels. A significant portion of the new expense items implement Strategic Planning items identified by the Board as priorities for 2019. This proposed increase is funded by a projected increase in revenue and is a balanced budget.

- A 2019 Capital Improvement Budget request of $3.0 million in 2019 projects, with another $1.38 million in projects carried over from prior years. The proposed projects were reviewed with the Board at the 2019 Strategic Planning Session on July 17 and at the initial Budget Workshop on September 5. The total 2019 Capital Improvement Budget is $4.38 million.

- Proposed 2019 Water Rate Adjustment of five percent (5%), which is modeled through CHWD's Financial Plan.

BACKGROUND AND ANALYSIS:

As the Citrus Heights Water District plans for 2019, some of the key issues the budget addresses are as follows:

- **Economic activity.** The continued upswing in building and economic activity in the area has a spillover effect on workload in various areas of District operations. Increased building/development activity has resulted in significantly increased Underground Service Alert (USA) markings and field inspections to ensure proper installation and protection of new and existing District facilities. Also with building activity on the rise, the District has seen the effect of higher bids/unit costs for capital projects, as seen in the rising engineering cost index.

- **Water Supply Cost with San Juan Wholesale District**. In June 2018, the SJWD Board of Directors adopted a 9% Overall Wholesale Water Rate Adjustment. This increase, as well as increased projected water use, is anticipated to result in an 11.83% increase in cost for the

District in purchased water from 2018.

- **Addition of Senior Management Services Specialist.** The proposed budget reflects the addition of a Senior Management Services Specialist to effectively staff the District as opposed to utilizing temporary/contract help and diverting current District staff time from other key operation areas.

- **Retirement Benefits including Pensions and Other Post-Employment Benefits (OPEB).** Changes to Government Accounting Standards require unfunded liabilities, including PERS pension costs and retiree healthcare benefits, be reported on Financial Statements. Staff described the potential impacts these new Government Account Standards have on the District's financial position. As a result, the Board approved in the 2018 Budget to implement a 15-year Amortization Schedule for CalPERS pension Unfunded Accrued Liability (UAL) Contribution, saving the District $1,201,244 over the next 30 years. At the same time, the Board approved prefunding the District's OPEB Unfunded Accrued Liability (UAL) over 20 years, rather than paying costs as they are incurred. The result will save the District an estimated $140,000 over the next 30 years.

Operating and Capital Budget Overview

The proposed 2019 expenditure plan represents a shift from the 2018 expenditure plan in the following ways:

1) There is a significant shift from Capital to non-personnel Operations and Maintenance. This proposed change is due to increased SJWD costs (wholesale water purchases and increased wholesale water rates) and CHWD's focus in 2019 on advanced planning for infrastructure and programs. For example, this portion of the budget includes funding for Project 2030, the Water Meter Replacement Program planning study, ASR feasibility, District-wide easements and annexations, and similar planning activities.

2) The Capital portion of the budget for 2019 is aligned to match project delivery with available resources (staffing and direct project costs). Also, two capital projects (Thunderhead Circle water main and Stock Ranch water services replacements) identified in 2018 were re-evaluated, have been value-engineered and reprioritized for project delivery in 2019. Moreover, key capital projects are highlighted below. These projects were identified through a planning process that began with a review of the 1999 Master Plan, and utilizes the five staff member Engineering Department to its full potential. Project capacity is leveraged by the use of consultants/contractors on a project-specific basis.

3) The transfers to designated Reserves portion of the budget has decreased from 2018 due to several factors, including: conservation messaging from the State and milder weather conditions, resulting in a decline in projected consumption from last year. The decline in consumption has contributed to a flattening out of revenue between 2018 and 2019. However, costs have increased as described in this staff report. Transfers to Reserves have been adjusted to reflect projected

revenues based on a 5% rate adjustment for the coming year.

Key 2019 proposed expenditures for operating and capital improvements are summarized below.

Operating & Maintenance Budget: $13.05 million, increase of 7.4%, or $899,000 from the 2018 budget.

- $364,341 or 11.83% total increase in cost of treated water from San Juan Water District. The growth in costs includes the wholesale water rate increase of 9% as described above and an increase of projected water use, estimated to be 12,500 AF as compared to 12,000 AF in 2018.

- $1.89 million in Professional Services, including many Strategic Planning and Special Project items, including the Project 2030 Study, Water Meter Replacement Program, ASR Study, organizational development, District policy review/updates, rebuild of the financial model, review of easements, annexations, website redesign and water supply agreement.

- $48,350 increase in Tools and Equipment for three jackhammers, a vibraplate, two electric pumps and a locator.

- $356,652 increase in Salary and Benefits, which includes: Accelerated payoffs of the CalPERS pension Unfunded Actuarial Liability (UAL) and the OPEB UAL; 35% increase in the CalPERS employer contribution rate (due to factors such as the lowering of the assumed rate of return on CalPERS' portfolio); 25% increase in Health Insurance (due to factors such as increased plan costs (staff is currently researching provider and plan options)); 4.5%, for merit and cost of living adjustments; and, 1.35% increase is attributable to the addition of the proposed Senior Management Services Specialist position.

About $550,000 in salary and benefit costs are allocated to the Capital Improvement Budget to account for staff time spent in the planning, design, construction and inspection of capital projects by District employees.

Capital Improvement Program Budget: A 2019 Capital Improvement Budget of $3.0 million in 2019 projects, plus another $1.38 million in projects carried over from prior years. The total 2019 Capital Improvement Budget is $4.38 million.

Project highlights include:

- Replacement of aging customer water services budgeted at $957,700 to include replacements within the Stock Ranch subdivision.

- Replacement, upgrades and new fire hydrants for $159,150.

- Six water main replacements or installation projects, scheduled to start in 2019 projected cost of $665,350 with completion targeted for 2020.

- Operations equipment replacements and new equipment totaling $295,000.

- Groundwater Well continued property acquisition carryover allocating of $460,000.

Designated Reserves Transfers:

The proposed 2019 budget meets all policy targets for fund balances in the District's designated reserves in addition to the reserve transfers noted below.

- $66,000 transfer to complete the replenishment of the Rate Stabilization Reserve to bring the fund back to its policy target of $1million. $366,000 was drawn down from the fund in 2015 due to the drought.

- $400,000 transfer to the Water Supply Reserve based upon projected revenue.

- $200,000 transfer to the Water Meter Replacement Reserves for accrual of funds toward Meter Replacements at the end of their useful life, projected to start in 2025.

Total Operating, Capital and designated Reserved Transfers Budgets for 2019:

Total Funding Requirements for 2019 Budgets:

Operating Budget	CIP Budget	Transfers to Reserves	Total
$13.05 million	$4.38 million	$666,000	$18.1 million

Water Rates and Charges Overview

The Board of Directors is considering a 5% rate adjustment for 2019 to support operation of the District and continued reinvestment in the District's infrastructure.

Proposition 218 Notification

The District must provide written notification of proposed water rate adjustments to all property owners within the District in accordance with the requirements of Proposition 218. The notification must be received a minimum of 45 days in advance of the public hearing where the rate adjustments are to be considered. If the Board of Directors elects to consider an increase in water service charges or usage charges for 2019, the District must prepare and mail a Proposition 218 notification no later than October 21, 2018 in order to meet the notification requirement for a public hearing at the Board's December 5, 2018 Special Meeting.

Miscellaneous charges and fees that apply to specific services provided by the District, such as plan check and inspection charges, service installation charges and capacity fees, are not subject to Proposition 218 notification requirements. The proposed fee schedule will be presented in the November 14 Board of Directors meeting for review, discussion and possible action at the December 5 Public Hearing.

Public Information and Public Engagement Program for the 2019 Budget

At the September 5 Budget Study Session, staff indicated it would continue with the a public information and public engagement plan to help inform customers concerning key issues facing the District (e.g., increasing costs from San Juan Water District, aging infrastructure that is in need of replacement, and the importance for the District to continue its groundwater well development program). This outreach effort is proposed to occur in conjunction with the budget and rate adoption process.

Key messages and themes include: 1) With the proposed rate increase, Citrus Heights Water District will maintain water rates over 9% below the average water rate for a family of four in the Sacramento region; 2) the rate increase is important to ensure that the District is able to replace aging infrastructure; 3) The ability to replace aging infrastructure, and to expand the District's access to groundwater by developing wells is vital to ensuring long term reliability of supply at relatively low cost to the customer; 4) The District maintains a low cost structure in terms of on-going operational expenses, and the rate increase will enable the District to replace infrastructure and expand its groundwater supply at lower cost in "today's" versus "tomorrow's" dollars; 5) The proposed rate increase, based on average consumption for a family of four in a single family home with a one-inch water meter, is about $2.88 per month; 6) The District prides itself on operating in an open and transparent manner and will be available at multiple venues to discuss the rate increase; and 7) The rate increase will enable the District to continue to plan for the future, and prevent sliding into a "reactive mode" of operating and providing service to customers.

Key channels for educating and engaging customers include: the Proposition 218 Notice; a Hand-out/Mailer; new informational web; in-person meetings with stakeholder audiences; "road show" PowerPoint provided by key staff (General Manager, Engineering Manager, Operations Manager and Administrative Services Manager) to the City's neighborhood associations, service organizations (e.g., Rotary, Kiwanis & Soroptimist), the Orangevale CPAC; and use of the District's Facebook page. The District is also exploring other social media platforms.

These activities will take place in the time leading up to the Board's consideration of adopting the 2019 budget and rate increase on December 5, 2018.

RECOMMENDATION:

1. Review and discuss the proposed Operating and Capital Improvement Budgets and Water Rate Schedule for 2019, and receive public comment.

2. Provide direction to staff on the draft budget and water rate schedule for 2019 to be used to make any desired changes or refinements as staff moves forward with the preparation of the Proposition 218 Notice.

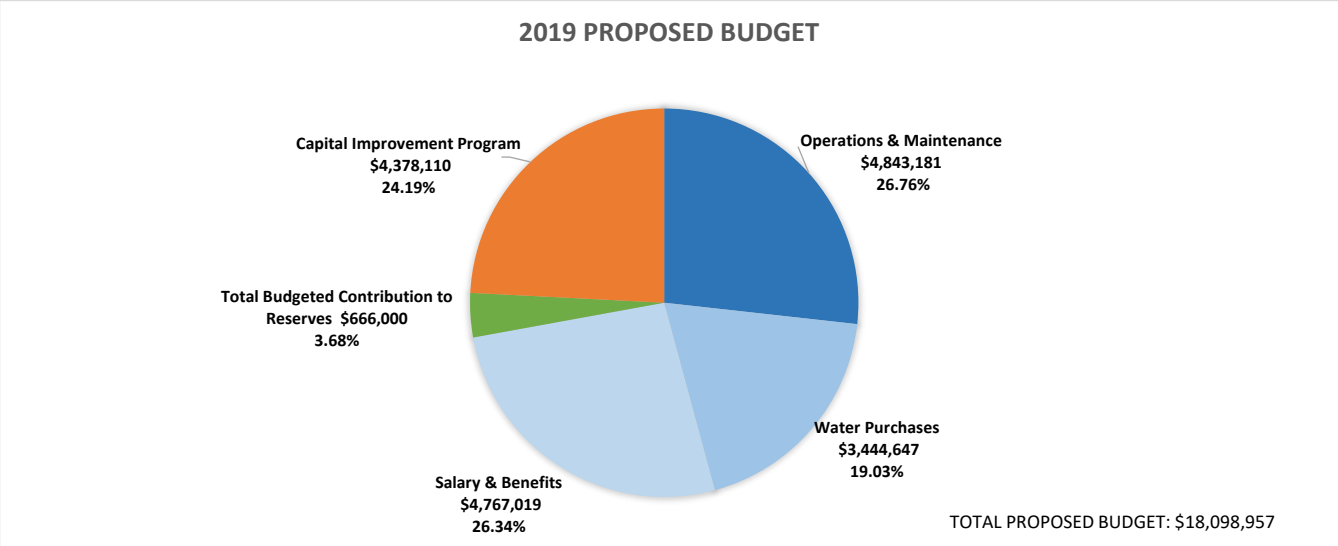
ATTACHMENTS:

1. 2019 Proposed Total Budget Summary
2. 2019 Proposed Operating Budget Summary
3. 2019 Proposed Capital Improvement Budget Summary
4. 2019 Proposed Funds and Reserves Transfers
5. 2019 Proposed Water Rate Schedule

ATTACHMENT 1

Proposed 2019 Total Budget Request

	2016 Actual	2017 Actual	2018 Adopted Budget	2018 Projected	2019 Proposed Budget	% Change 2018 vs. 2019
Beginning Fund Balance					**$ 13,258,717**	
Revenues						
Rate Revenue	$ 11,608,202	$ 13,450,282	$ 14,260,000	$ 14,200,000	$ 14,910,000	4.56%
Collections Fees & Penalties	$ 695,909	$ 594,000	$ 406,000	$ 500,000	$ 450,000	10.84%
Grants/ Misc	$ 1,063,413	$ 1,100,000	$ 161,000	$ 400,000	$ 150,000	-6.83%
Total Revenue	$ 13,367,524	$ 15,144,282	$ 14,827,000	$ 15,100,000	$ 15,510,000	4.61%
Operating & Maintenance Budget						
Operations & Maintenance	$ 1,929,651	$ 2,392,058	$ 4,665,914	$ 2,974,501	$ 4,843,181	3.80%
Water Purchases	$ 2,190,061	$ 2,692,482	$ 3,080,306	$ 3,279,886	$ 3,444,647	11.83%
Salary & Benefits	$ 3,071,341	$ 3,949,495	$ 4,410,367	$ 4,450,885	$ 4,767,019	8.09%
Total Expense	$ 7,191,053	$ 9,034,034	$ 12,156,588	$ 10,705,272	$ 13,054,847	7.39%
Net Contribution to/(Use) of Reserves					**$ 2,455,153**	
Contribution to Reserves Budget						
Total Budgeted Contribution to Reserves	$ 1,000,000	$ 575,000	$ 1,760,000	$ 1,760,000	$ 666,000	
Net Contribution to Capital Improvement Reserve	$ (1,000,000)	$ (575,000)	$ (1,760,000)	$ (1,760,000)	$ 1,789,153	
Capital Improvement Program Budget						
Capital Improvement Program Budget (Funded through CIP Reserve)	$ 4,449,687	$ 3,419,838	$ 6,625,759	$ 2,666,192	$ 4,378,110	
Ending Fund Balance					**$ 11,872,709**	
Fund Balance Policy Target					**$ 11,851,559**	
Policy Target Surplus/(Deficit)					**$ 21,150**	



ATTACHMENT 2

Proposed 2019 Operating Budget

CITRUS HEIGHTS WATER DISTRICT
2019 OPERATING BUDGET SUMMARY

Account	Title	2017 Budget (Adopted)	2017 Actual	2018 Budget (Adopted)	2018 Projected	2019 Budget (Proposed)
23200	COP Debt - Current	565,000	565,000	585,000	757,500	610,000
50100	Purchased Water	2,851,387	2,692,482	3,080,306	3,279,886	3,444,647
52100	Labor Reg	3,058,234	2,916,871	3,333,464	3,300,000	3,510,868
52110	Labor Taxes	222,350	211,466	248,315	240,518	273,184
52305	Benefits Med/Den/Vis	426,920	431,384	465,756	537,704	584,668
52310	Benefits LTD/Life/EAP	43,762	29,894	45,158	48,079	57,175
52315	Benefits CalPERS	201,950	232,017	243,172	253,000	329,925
52320	Benefits Other	30,000	31,340	30,000	30,659	30,350
52335	Benefit Retiree Expenses	49,300	137,000	50,533	43,290	52,554
52340	Benefit Unemployment Insurance	8,400	6,904	8,400	8,620	9,240
52350	Benefit UAL Pension	388,755	382,002	433,569	382,358	389,055
52355	Benefit UAL OPEB	-	-	102,000	80,000	80,000
52900	Capitalized Labor & Benefits Contra	(550,000)	(474,642)	(550,000)	(473,343)	(550,000)
52115	Insurance - Workers Comp	54,319	16,059	63,000	63,000	80,900
52120	Labor External	85,010	47,864	115,700	14,144	103,740
54100	Fees & Charges	119,385	91,188	158,055	108,538	191,095
54110	Regulatory Compliance/Permits	34,200	123,569	81,015	38,562	85,065
54115	District Events & Recognition	21,190	15,355	39,528	38,000	64,840
54305	Maintenance/Licensing	129,632	136,139	135,932	135,932	147,110
54310	Equipment Maintenance	80,200	59,058	88,542	83,322	103,125
54315	Professional Development	71,420	57,473	99,290	75,000	114,819
54325	Department Admin	47,200	44,066	42,000	60,000	23,200
54330	Dues and Subscriptions	132,135	141,778	146,629	142,000	148,890
54340	Gas & Oil	51,000	42,070	51,000	55,000	56,100
54345	General Supplies	31,500	22,557	33,500	30,000	62,200
54350	Insurance - Auto/Prop/Liab	75,000	140,751	85,000	85,000	89,250
54355	Leasing/Equipment Rental	10,000	13,753	22,060	21,198	27,060
54360	Other Agency Cost Reimbursement	5,000	4,891	5,000	5,000	5,000
54365	Parts and Materials	45,000	197,973	55,000	238,540	55,000
54370	Postage/Shipping/Freight	124,000	131,575	124,000	137,283	169,100
54375	Rebates & Incentives	19,680	11,855	19,680	11,657	29,680
54380	Telecom/Network	40,940	38,380	41,300	40,107	45,500
54385	Tools & Equipment	51,700	44,462	61,700	57,356	110,050
54390	Utilities	224,384	131,382	181,718	123,121	156,890
54395	Bad Debt Expense	5,000	1,592	5,000	-	5,000
54500	Support Services	1,040,799	594,287	1,935,129	936,320	1,899,992
54505	Legal Services	94,000	207,557	300,000	200,000	300,000
54510	Printing Services	36,500	15,768	40,200	25,000	36,950
54900	Captialized Parts/Materials	-	(277,087)	-	(309,280)	-
54905	Capitalized Equipment Use	-	(396,316)	-	(320,425)	-
59300	Interest Expense	173,738	169,059	150,936	122,625	122,625
Total		10,098,990	9,034,034	12,156,588	10,193,605	13,054,847

ATTACHMENT 3

Proposed 2019 Capital Improvement Program Budget

CITRUS HEIGHTS WATER DISTRICT
2018 CAPITAL PROJECTS BUDGET - SUMMARY BY PROJECT
Proposed: September 19, 2018

Project Number	Description	2018 Adopted Budget	2018 Projected Expense	2019 Projected Expense	2020 Projected Expense	Proposed Project Budget	Project Budget Amendment Request
C15-109	Blossom Hill Way 6" x 10" Interconnection w/ RV	25,477	-	27,777	-	27,777	2,300
C15-110	Crestmont Avenue 6" Interconnection w/ RV	22,850	-	24,288	-	24,288	1,438
C15-104	Technology Hardware and Software Improvements/Replacements	250,000	-	-	250,000	-	(250,000)
C16-134	Auburn Blvd - Rusch Park to Placer County Line	8,477	-	10,000	157,000	10,000	1,523
C17-101	Pleasant View Dr - Oak Av to Poppyfield Wy	521,010	521,010	180,890	-	701,900	180,890
C17-103	Operations Building Remodel	125,000	-	50,000	-	50,000	(75,000)
C17-104	Groundwater Well Property Acquisition (# 7, 8, 9 & 10)	890,000	430,000	460,000	-	890,000	-
C18-102	Thunderhead Circle	57,407	-	157,407	-	157,407	100,000
C18-103	Cologne Way	27,511	27,511	192,960	-	220,471	192,960
C18-104	Quiet Oak Lane	10,445	-	127,654	-	127,654	117,209
C18-105	Old Auburn Road - Daffodil Way & Wooddale Way	7,979	-	150,465	-	150,465	142,486
Encumbered Projects Total		1,946,157	978,521	1,381,441	664,500	2,359,962	413,805
C19-005	Annual Facilities Improvement	125,000	125,000	140,000		140,000	
C19-003	Annual Fleet Improvements/Replacements	145,000	145,000	295,000		295,000	
C19-004	Annual Technology Hardware and Software Improvements/Replacements	125,000	125,000	10,000		10,000	
C19-010	Annual Water Main Pipeline Replacements	64,890	64,890	66,843		66,843	
C19-011	Annual Water Valve Installations/Replacements	144,200	91,281	148,540		148,540	
C19-012	Annual Water Service Connections (Replacements)	850,000	850,000	957,700		957,700	
C19-013	Annual Water Meter Replacements	107,000	107,000	129,086		129,086	
C19-014	Annual Fire Hydrants - Replacements / Upgrades / Infill / New	154,500	154,500	159,150		159,150	
C19-020	Annual Groundwater Well Improvements	100,000	75,000	175,000		175,000	
C19-040	Annual Other City Partnership Opportunities	300,000	100,000	100,000		100,000	
C19-041	Annual Other Miscellaneous Infrastructure Projects	103,000	30,000	50,000	-	80,000	
2019 New Annual Capital Total [1]		1,815,590	1,737,671	2,081,319	-	2,081,319	-
C19-101	Robie Way 8" Main Replacement Project			26,846	233,669	26,846	
C19-102	Patton Avenue - Watson Way to North			67,679		67,679	
C19-103	Watson Way - Sherlock Way to Well Site			406,401		406,401	
C19-104	Admiral Avenue Water Main Replacement			30,310	261,129	30,310	
C19-105	Whyte Avenue and Langley Avenue Water Main Replacement Project			83,235	659,420	83,235	
C19-106	Wells Avenue 8-inch (San Juan to Wells)			22,460	188,202	22,460	
C19-107	Rowan Way 8" & 6" Water Main at Grady Drive			28,419	120,500	28,419	
C19-108	6230 Sylvan Road - East Wall			250,000	-	250,000	
2019 New Projects Total Budget		-	-	915,350	1,462,920	915,350	
	Totals	**3,761,747**	**978,521**	**4,378,110**	**1,957,051**	**5,356,631**	**413,805**

Summary	Total Budget
Prior Years Carry-Over Capital Project Total	**1,946,157**
Plus:	
Prior Years Projects Amendment Approval/(Savings)	413,805
2019 New Annual Capital Project Total	2,081,319
2019 New Capital Project Total	915,350
2019 Capital Project Total Budget Request	**3,410,474**
Total CIP Budget	**$ 5,356,631**

[1] Prior Year Annual Projects are inlcuded for comparison purposes only as Annual Projects are completed on an annual basis

ATTACHMENT 4

Proposed 2019 Reserve Transfer Budget

CITRUS HEIGHTS WATER DISTRICT
2019 RESERVE TRANSFER BUDGET SUMMARY

Reserves Transfers	2016 Acutal	2017 Actual	2018 Adopted	2019 Proposed
Rate Stabilization Reserve	100,000	100,000	100,000	66,000
Water Efficiency Reserve	75,000	75,000	50,000	-
Water Supply Reserve	100,000	100,000	1,150,000	400,000
Water Meter Replacement Reserve	725,000	300,000	300,000	200,000
Total	$ 1,000,000	$ 575,000	$ 1,760,000	$ 666,000

ATTACHMENT 5

Proposed 2019 Water Rate Schedule

CITRUS HEIGHTS WATER DISTRICT
2019 WATER RATES, FEES AND CHARGES
Proposed -- September 19, 2018

Type of Charge	Applied Basis or Frequency	2018 Adopted	2019 Adopted	Bi-monthly $ Change
Charges for Metered Rate Customer Accounts				
Service Charge, Domestic, Commercial & Irrigation Meters				
¾-inch meter	bi-monthly, per meter	$48.94	$51.38	$2.44
1-inch meter	bi-monthly, per meter	$74.46	$78.18	$3.72
1½-inch meter	bi-monthly, per meter	$91.48	$96.05	$4.57
2-inch meter	bi-monthly, per meter	$176.55	$185.37	$8.82
3-inch meter	bi-monthly, per meter	$278.65	$292.58	$13.93
4-inch meter	bi-monthly, per meter	$550.93	$578.47	$27.54
Service Charge, Combination Meters				
Low flow bypass meter	bi-monthly, per meter	$0.00	$0.00	$0.00
4-inch meter	bi-monthly, per meter	$176.55	$185.37	$8.82
6-inch meter	bi-monthly, per meter	$278.65	$292.58	$13.93
8-inch meter	bi-monthly, per meter	$550.93	$578.47	$27.54
10-inch meter	bi-monthly, per meter	$1,342.17	$1,409.27	$67.10
Other Service Charges				
Service Charge, Construction Meters				
2½-inch and 3-inch meters	bi-monthly, per meter	$278.65	$292.58	$13.93
Service Charge, North Ridge Country Club Meter (multiplier = 3.00, not annexed)	bi-monthly, per meter	$223.39	$234.55	$11.16
Service Charge, Mount Vernon Memorial Park (multiplier = 2.31,based upon property annexed)				
Low flow bypass meter	bi-monthly, per meter	$0.00	$0.00	$0.00
8-inch Combination meter	bi-monthly, per meter	$1,272.64	$1,336.27	$63.63
Usage Charges for Water Consumed	*1 unit = 100 cubic feet = 748 gallons*			
Domestic, Commercial, Irrigation,Combination				
All meter sizes	per unit	$1.0167	$1.0674	$0.0507
Construction Meters	per unit, for all units bi-monthly	$3.0488	$3.2012	$0.1524
North Ridge Country Club Meter	per unit, for all units bi-monthly	$3.0400	$3.1920	$0.1520
Mount Vernon Memorial Park (2.31 multiplier)	per unit, for all units bi-monthly	$2.3400	$2.4570	$0.1170
Unannexed property (surplus water only)	multiplier times annexed rate, applied to service charge and commodity charge	3	3	--------
Wheeling Water Charge (unless otherwise adopted by mutual aid agreement)				
	per acre-foot to Cal-American WC	$57.88	$60.77	$2.89
	per acre-foot to Carmichael WD	$57.88	$60.77	$2.89
	per acre-foot to Fair Oaks WD	$57.88	$60.77	$2.89
	per acre-foot to Orangevale WD	$3.94	$4.13	$0.19
	per acre-foot to City of Roseville	$57.88	$60.77	$6.05
	per acre-foot to Sac. Suburban WD	$57.88	$60.77	$2.89
	per acre-foot to San Juan WD	$3.94	$4.13	$0.19
Commercial Fire Sprinkler Service Charges				
4-inch and smaller	per service, bimonthly	$77.78	$81.66	$3.88
6-inch	per service, bimonthly	$100.89	$105.93	$5.04
6-inch; one-half shared	per service, bimonthly	$50.44	$52.96	$2.52
6-inch; one-third shared	per service, bimonthly	$33.62	$35.30	$1.68
8-inch	per service, bimonthly	$122.88	$129.02	$6.14
8-inch; one-half shared	per service, bimonthly	$61.43	$64.50	$3.07
10-inch	per service, bimonthly	$165.64	$173.92	$8.28
12-inch	per service, bimonthly	$219.46	$230.43	$10.97

AGENDA ITEM: MS-1

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT	:	METER REPLACEMENT STUDY UPDATE
STATUS	:	Information Item
REPORT DATE	:	September 05, 2018
PREPARED BY	:	Hilary Straus, General Manager David Gordon, Operations Manager Rex Meurer, Water Efficiency Supervisor

Staff will provide an update on the consultant selection process for the planning study for the Meter Replacement Program and next steps.

AGENDA ITEM: MS-2

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO BOARD OF DIRECTORS
SEPTEMBER 19, 2018 MEETING

SUBJECT	: WATER SUPPLY MANAGEMENT UPDATE
STATUS	: Information Item
REPORT DATE	: September 05, 2018
PREPARED BY	: Hilary Straus, General Manager

Staff will provide an update on water supply management and next steps.