

Water Balance Summary

Prepared for

Sacramento River Settlement Contractors

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Acronyms and Abbreviations

BWMP	Sacramento River Basinwide Water Management Plan
CIMIS	California Irrigation Management Information System
district	irrigation district
ET	evapotranspiration
ETo	reference ET
ITRC	Irrigation Training and Research Center
ITRC Report	<i>California Evapotranspiration Data for Irrigation District Water Balances</i>
Reclamation	Bureau of Reclamation
SRSC	Sacramento River Settlement Contractor

Water Balance Summary

Water balance summaries were developed for each participating Sacramento River Settlement Contractor (SRSC) and are included in Appendix A for the 2013–2015 irrigation years. These summaries are based on the Agricultural Water Inventory Tables (Standard Tables) in the *Water Management Planner* (Bureau of Reclamation [Reclamation], 2014) to meet the 2011 Standard Criteria for Agricultural and Urban Water Management Plans. The tables were modified to display and identify information unique to the SRSCs, including rice production. The summaries are limited to the April through October period covered by the SRSC contracts.

Surface water supplies are based on records of the SRSC diversions from Reclamation monthly water accounting and SRSC records. Irrigation district (district) groundwater pumping is based on SRSC records. Private groundwater pumping is estimated by the SRSCs.

Precipitation data are based on the average monthly precipitation reported for the Sacramento Valley by the California Irrigation Management Information System (CIMIS) for the Colusa, Davis, and Verona stations; for the Redding Sub-basin, precipitation data are based on information from the Gerber CIMIS station for 2013, Shasta College CIMIS station for 2014, and Gerber South CIMIS station for 2015.

Crop evapotranspiration (ET) tables were prepared using (1) crop coefficients (Kc values) developed by the Irrigation Training and Research Center at California Polytechnic State University for district water balances for dry year surface irrigation and (2) monthly 2013-2015 reference ET (ET_o) from CIMIS. For the SRSCs in the Sacramento Valley, Kc values were developed using the Zone 12 data from the Irrigation Training and Research Center (ITRC) Report (2003) and the average ET_o data reported by CIMIS at Colusa, Davis, and Verona stations for 2013–2015. The crop ET for the Redding Sub-basin is based on the Zone 14 data from the ITRC Report and 2013 ET_o data for the Gerber CIMIS station, 2014 ET_o data for the Shasta College CIMIS station and 2015 ET_o data for the Gerber South CIMIS station. Evaporation for use in estimating distribution system evaporation and seepage is estimated at 1.1 times the monthly ET_o. Effective precipitation is estimated at 60 percent of the irrigation season precipitation.

Leaching requirements were developed using the methods and equations described by R.S. Ayers and D.W. Westcot in *Water Quality for Agriculture* (Food and Agricultural Association of the United Nations, 1985) (also known as FAO Irrigation and Drain Paper 29, Rev. 1). As identified in the footnotes to Table 5 of the water balances, the crop consumptive use values do not include water required for initial flooding, re-flooding, or flow-through on rice fields.

These source data were considered the most accurate and current information available at the district level for the 2013–2015 irrigation seasons. Information provided in the original Sacramento River Basinwide Water Management Plan (BWMP) was developed by and obtained from the California Department of Water Resources for a normalized 1995 cropping pattern for projected normal and drought conditions. The unit ET of applied water assumed for each district in the BWMP compares favorably with the ITRC and CIMIS assumptions and data used to develop the balance summaries for the 2013–2015 irrigation seasons.

Table 6 of the water balances summarizes the inflows and outflows from the individual SRSCs, including estimates of available soil moisture, inflow from precipitation, and ET precipitation by crops. Figure 1 summarizes the SRSC water balances. The various sources of the district outflows have been estimated by the SRSCs. The subtotal without recirculation was used as a closure term. As such, in addition to percolation to the groundwater basin, the volume shown includes unaccounted for drain water outflow; errors in assumptions used in calculations or estimated uses such as crop water use (ET); and other factors such as effective precipitation, evaporation, and groundwater recharge. A positive value

indicates that the assumed percolation to groundwater is greater than groundwater pumping. A negative value may indicate uncounted for groundwater pumping from privately owned wells. Table 6 of the water balances also shows the quantities of water recaptured and recirculated for reuse within the SRSC service areas.

In addition to the individual water balance tables, a regional-level summary of SRSC diversion and return flows for the 2013–2015 irrigation years was prepared. Figures 2, 3, and 4 are schematics that illustrate the relationships between participating SRSCs and show diversions from the Sacramento River and return flows to the river attributable to the participating SRSCs. Return flows to the river are available for various uses including re-diversion or environmental benefits. The regional-level summaries of SRSC diversion and return flows also identify the average diversion and average consumptive use per cropped acre within the participating SRSC service area for each irrigation year.

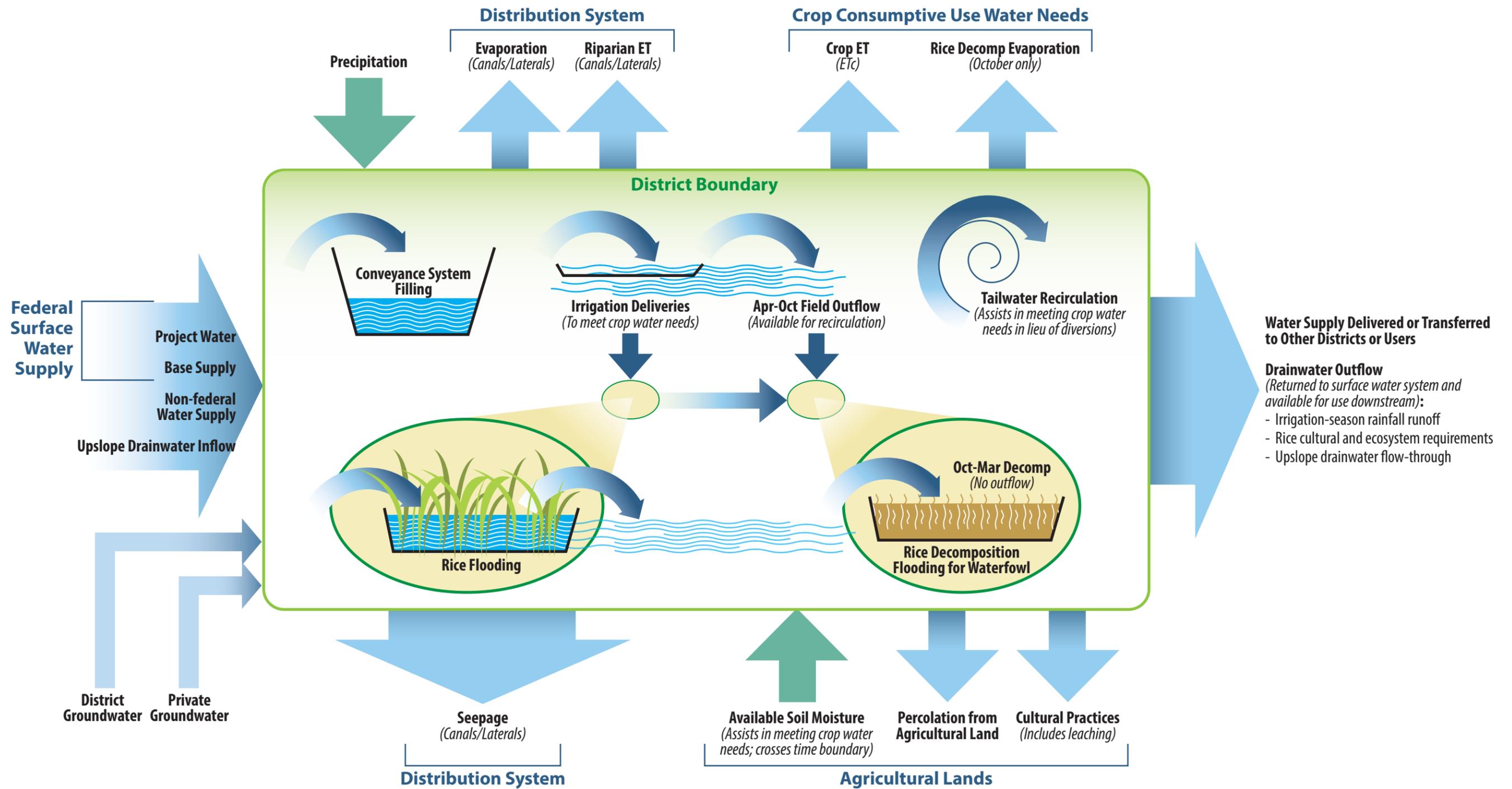
References

Bureau of Reclamation (Reclamation). 2014. *Water Management Planner*. December.

Food and Agriculture Organization of the United Nations. 1985. *Water Quality for Agriculture*. FAO Irrigation and Drain Paper 29, Rev. 1. Prepared by R.S. Ayers and D.W. Westcot. Reprinted 1989 and 1994.

Irrigation Training and Research Center (ITRC). 2003. *California Evapotranspiration Data for Irrigation District Water Balances* (ITRC Report). 2016 update available at: <http://www.itrc.org/etdata/waterbal.htm>.

Figures

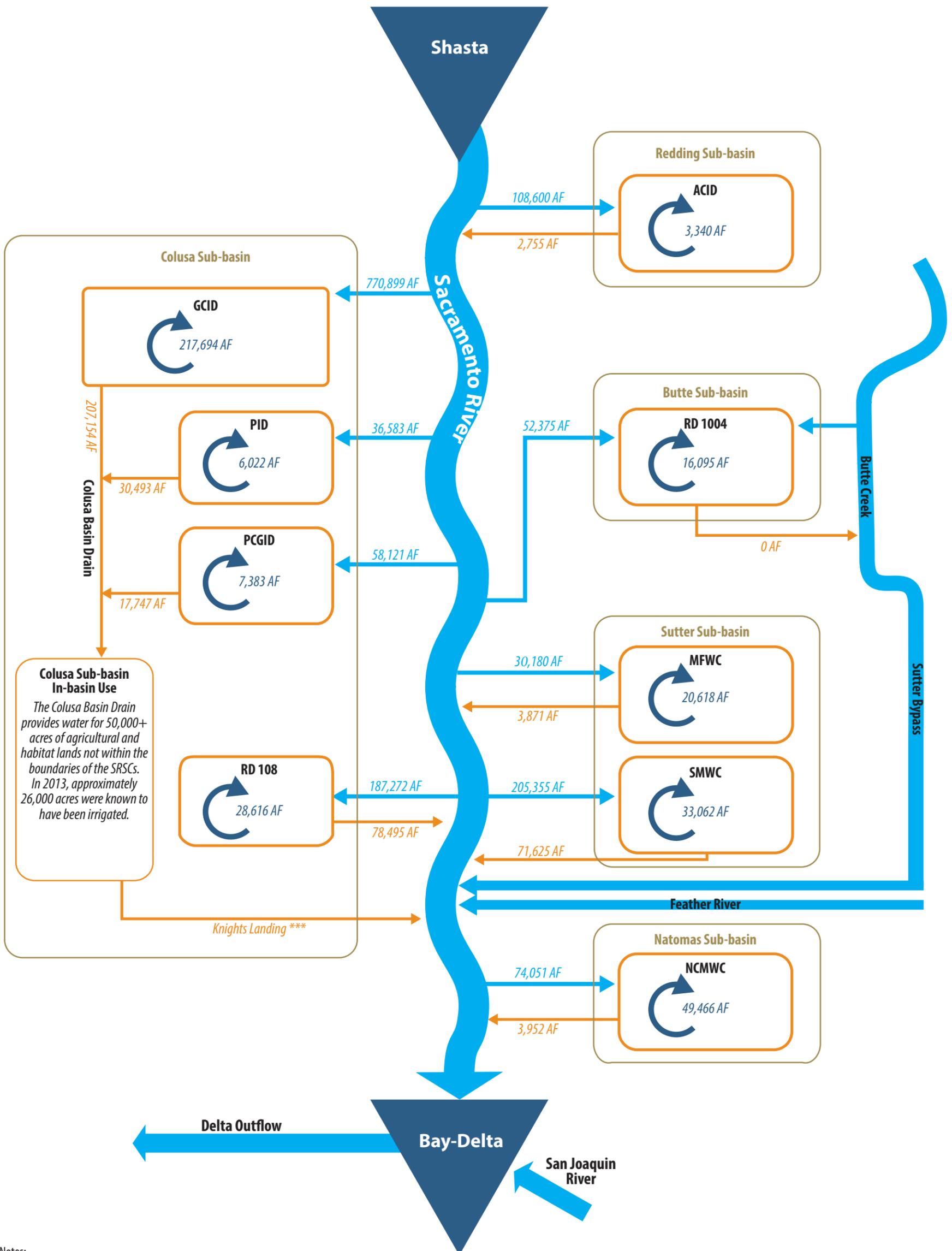


Note: All district inflows and outflows except for rice decomp evaporation are April through October. Rice decomp evaporation is October only.

FIGURE 1
SCHEMATICS OF DISTRICT WATER BALANCE

SUMMARY	
SRSC 2013 Diversions*	1,523,436 AF
SRSC 2013 Return Flows (available for use downstream)*	416,091 AF
Total 2013 Recirculation/Reuse by SRSCs	382,296 AF

SUMMARY (Cont.)	
Total Cropped Acres for 2013**	407,429 AC
Average Diversion for 2013 (SRSC Diversion ÷ Total Cropped Acres)	3.74 AF/AC
Average Consumptive Use for 2013 (SRSC Diversion - SRSC Return Flow) ÷ Total Cropped Acres	2.72 AF/AC

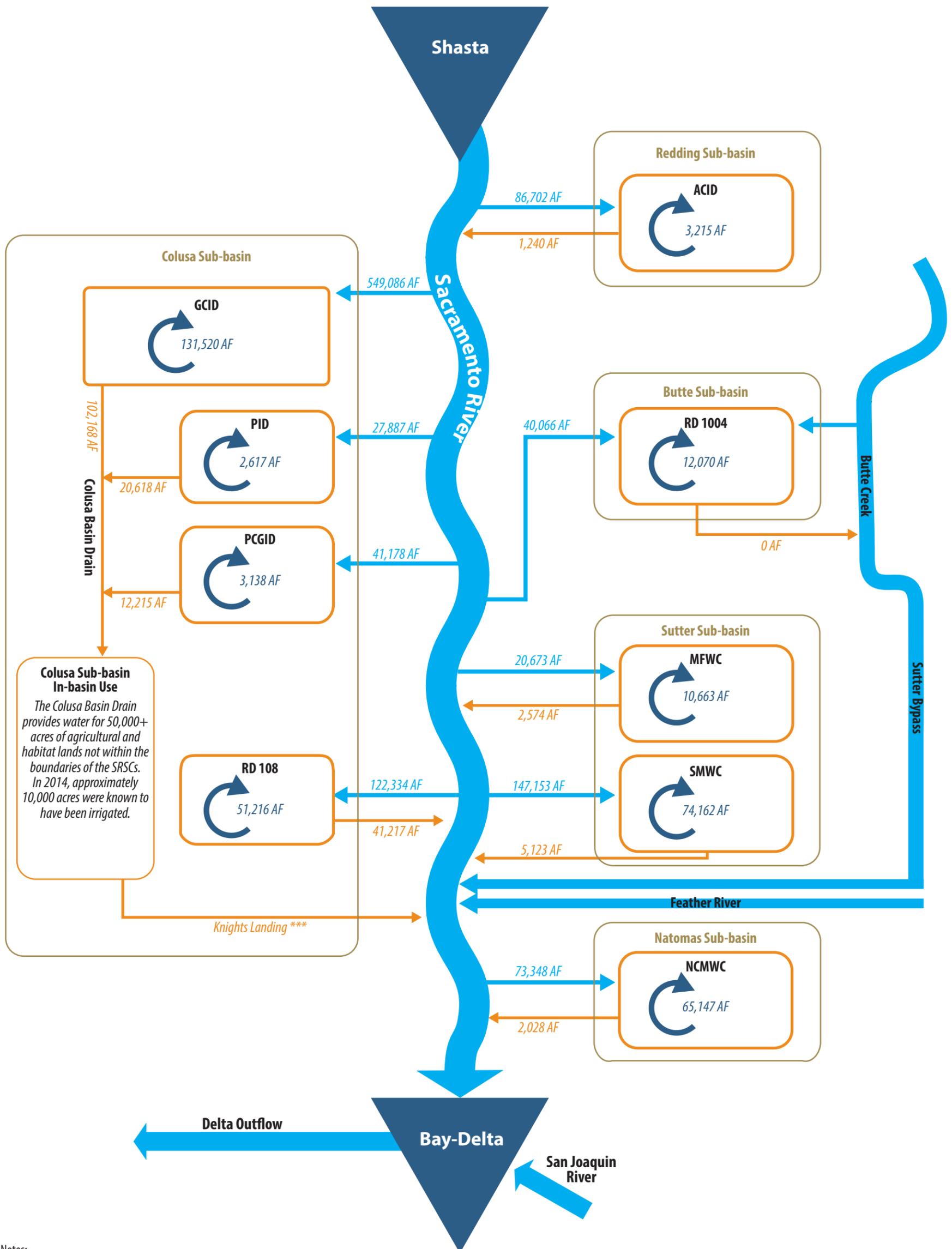


Notes:
 * Diversions and return flows are from 2013 SRSC water balance tables.
 ** Total cropped acres for 2013 includes 26,000 acres within the Colusa Sub-basin that rely on return flows from the SRSCs for surface water supplies.
 ***Flow data associated with the return flow at Knights Landing is not available after September 2012 as a result of modifications made to outfall gates and funding constraints.
 AC = acre
 AF = acre-feet

**FIGURE 2
 SCHEMATICS AND SUMMARY OF
 2013 SRSC DIVERSIONS AND RETURN FLOWS**

SUMMARY	
SRSC 2014 Diversions*	1,108,427 AF
SRSC 2014 Return Flows (available for use downstream)*	187,182 AF
Total 2014 Recirculation/Reuse by SRSCs	353,748 AF

SUMMARY (Cont.)	
Total Cropped Acres for 2014**	306,781 AC
Average Diversion for 2014 (SRSC Diversion ÷ Total Cropped Acres)	3.61 AF/AC
Average Consumptive Use for 2014 (SRSC Diversion - SRSC Return Flow) ÷ Total Cropped Acres	3.00 AF/AC

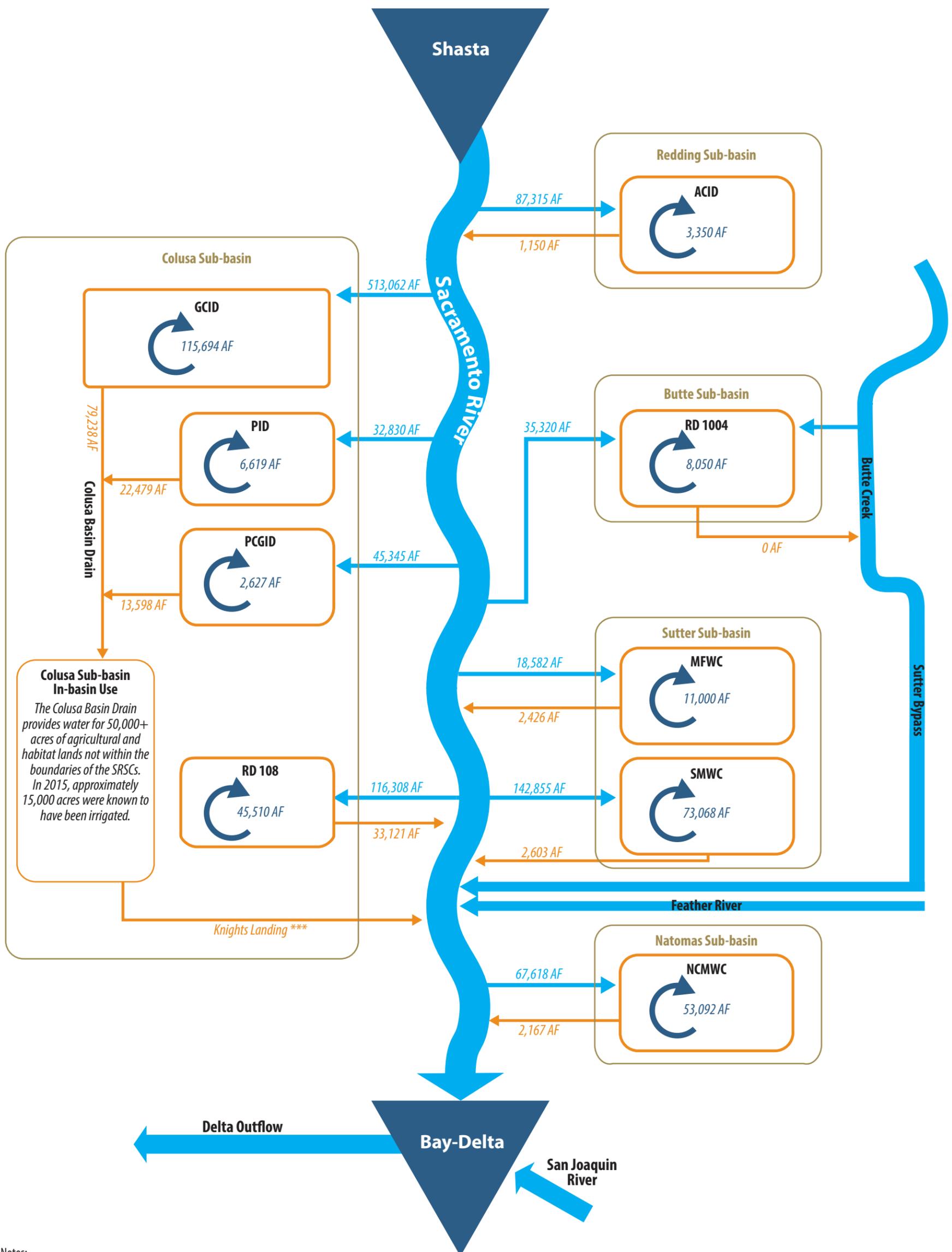


Notes:
 * Diversions and return flows are from 2014 SRSC water balance tables.
 ** Total cropped acres for 2014 includes 10,000 acres within the Colusa Sub-basin that rely on return flows from the SRSCs for surface water supplies.
 ***Flow data associated with the return flow at Knights Landing is not available after September 2012 as a result of modifications made to outfall gates and funding constraints.
 AC = acre
 AF = acre-feet

**FIGURE 3
 SCHEMATICS AND SUMMARY OF
 2014 SRSC DIVERSIONS AND RETURN FLOWS**

SUMMARY	
SRSC 2015 Diversions*	1,059,235 AF
SRSC 2015 Return Flows (available for use downstream)*	156,781 AF
Total 2015 Recirculation/Reuse by SRSCs	319,010 AF

SUMMARY (Cont.)	
Total Cropped Acres for 2015**	325,279 AC
Average Diversion for 2015 (SRSC Diversion ÷ Total Cropped Acres)	3.26 AF/AC
Average Consumptive Use for 2015 ((SRSC Diversion - SRSC Return Flow) ÷ Total Cropped Acres)	2.77 AF/AC



Notes:

- * Diversions and return flows are from 2015 SRSC water balance tables.
- ** Total cropped acres for 2015 includes 15,000 acres within the Colusa Sub-basin that rely on return flows from the SRSCs for surface water supplies.
- ***Flow data associated with the return flow at Knights Landing is not available after September 2012 as a result of modifications made to outfall gates and funding constraints.
- AC = acre
- AF = acre-feet

**FIGURE 4
SCHEMATICS AND SUMMARY OF
2015 SRSC DIVERSIONS AND RETURN FLOWS**

Appendix A
2013–2015 Sacramento River
Settlement Contractor
Water Balance Tables

Anderson-Cottonwood
Irrigation District

Anderson Cottonwood Irrigation District

TABLE 1

**Anderson Cottonwood Irrigation District – 2013 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	12,073	0	0	0	12,073
May	20,653	0	0	0	20,653
June	18,249	0	0	0	18,249
July	17,479	0	0	0	17,479
August	17,804	0	0	0	17,804
September	16,940	0	0	0	16,940
October	5,402	0	0	0	5,402
TOTAL	108,600	0	0	0	108,600

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Anderson Cottonwood Irrigation District – 2013 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
TOTAL	0	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Anderson Cottonwood Irrigation District – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	12,073	0	12,073
May	20,653	0	20,653
June	18,249	0	18,249
July	17,479	0	17,479
August	17,804	0	17,804
September	16,940	0	16,940
October	5,402	0	5,402
TOTAL	108,600	0	108,600

^aIn addition to the water supplies shown in Table 3, 3,340 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Anderson Cottonwood Irrigation District**Anderson Cottonwood Irrigation District – 2013 Distribution System Evaporation and Seepage Worksheet**

2015 Sacramento Valley Regional Water Management Plan Annual Update

2013	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.9	0.07	1.7	0.14
Feb	0.2	0.01	3.0	0.25
Mar	0.8	0.06	4.2	0.35
Apr	0.3	0.03	6.9	0.58
May	0.7	0.06	8.4	0.70
Jun	0.5	0.04	9.4	0.78
Jul	0.0	0.00	10.0	0.84
Aug	0.0	0.00	8.1	0.68
Sept	0.5	0.04	6.2	0.52
Oct	0.0	0.00	4.7	0.39
Nov	1.0	0.08	2.9	0.24
Dec	0.2	0.02	2.4	0.20
TOTAL-YR	4.9	0.41	67.9	5.66
TOTAL-Apr-Oct	2.0	0.17	53.8	4.48

^aPrecipitation is precipitation reported for CIMIS Station at Gerber (#8).^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the reference ET (ET_o) reported for the Gerber CIMIS Station.

TABLE 4

Anderson Cottonwood Irrigation District – 2013 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	177,952	30	123	20	549	24,511	(25,040)
Laterals	871,324	10	200	33	896	11,202	(12,065)
TOTAL			323	54	1,445	35,713	(37,105)

^aFrom District statistics.^bAverage width of the conveyance facilities.^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season (April-October).^dEstimated evaporation from canals, laterals, and drains during the irrigation season.^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Anderson Cottonwood Irrigation District

TABLE 6

**Anderson Cottonwood Irrigation District – 2013 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	108,600
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,286
Available Soil Moisture ^c	Estimated	329
	Total Water Supplies =	110,215
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	35,713
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,392
Riparian ET ^d (Canals/Laterals)	Estimated	10,679
Conveyance System Filling ^e (Canals/Laterals)	Estimated	1,086
	Total Distribution System =	48,870
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	25,971
Evapotranspiration of Precip - ET _{pr}	Table 5	69
Cultural Practices (includes Leaching Requirement)	Table 5	375
	Total Crop Water Needs =	26,415
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Upslope Drainwater Flow Through ^h	Estimated	0
Remainder Drainwater Outflow ⁱ	District Records	2,755
	Total District Outflow (from District Records) =	2,755
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	3,340
Percolation from Agricultural Lands^j (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		32,175

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs. Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on crop acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for cultural practices.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^jPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Anderson Cottonwood Irrigation District

TABLE 7

**Anderson Cottonwood Irrigation District – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2004	113,569	-	-	-	113,569	3,577	4,395
2005	102,018	-	-	-	102,018	3,214	3,948
2006	93,168	-	-	-	93,168	2,935	3,606
2007	111,903	-	-	-	111,903	3,525	4,331
2008	109,864	-	-	-	109,864	3,464	4,252
2009	106,922	-	-	-	106,922	3,368	4,138
2010	100,009	0	0	0	100,009	3,151	15,000
2011	89,814	0	0	0	89,814	3,150	15,000
2012	101,229	0	0	0	101,229	3,239	15,000
2013	108,600	0	0	0	108,600	3,340	2,755
Total	1,037,096	0	0	0	1,037,096	32,963	72,424
Average	103,710	0	0	0	103,710	3,296	7,242

^aFederal Ag Water Supply from Reclamation Water Account Records. Data prior to 2011 are not available.^bNon-Federal Ag Water Supply from District Records. Data prior to 2011 are not available.^cEstimated by District based on observation and historical information. Data prior to 2011 are not available.^dEstimated by District based on observation and historical information.

Anderson Cottonwood Irrigation District

TABLE 1

**Anderson Cottonwood Irrigation District – 2014 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	7,416	0	0	0	7,416
May	18,059	0	0	0	18,059
June	15,304	0	0	0	15,304
July	16,156	0	0	0	16,156
August	15,790	0	0	0	15,790
September	13,977	0	0	0	13,977
October	0	0	0	0	0
TOTAL	86,702	0	0	0	86,702

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Anderson Cottonwood Irrigation District – 2014 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
TOTAL	0	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Anderson Cottonwood Irrigation District – 2014 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	7,416	0	7,416
May	18,059	0	18,059
June	15,304	0	15,304
July	16,156	0	16,156
August	15,790	0	15,790
September	13,977	0	13,977
October	0	0	0
TOTAL	86,702	0	86,702

^aIn addition to the water supplies shown in Table 3, 3,215 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Anderson Cottonwood Irrigation District

Anderson Cottonwood Irrigation District – 2014 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.01	2.5	0.21
Feb	2.7	0.23	1.7	0.14
Mar	2.6	0.22	3.3	0.27
Apr	0.1	0.01	5.3	0.45
May	0.0	0.00	8.0	0.67
Jun	0.0	0.00	9.5	0.79
Jul	0.0	0.00	9.5	0.79
Aug	0.0	0.00	8.3	0.69
Sept	0.8	0.07	6.2	0.52
Oct	1.2	0.10	3.3	0.27
Nov	1.6	0.13	1.1	0.09
Dec	5.2	0.43	0.7	0.06
TOTAL-YR	14.5	1.21	59.3	4.94
TOTAL-Apr-Oct	2.2	0.19	50.1	4.17

^aPrecipitation is precipitation reported for CIMIS Station at Shasta College (#224).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the reference ET (ET_o) reported for the Shasta College CIMIS Station.

TABLE 4

Anderson Cottonwood Irrigation District – 2014 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	177,952	30	123	23	512	24,511	(25,000)
Laterals	871,324	10	200	37	835	11,202	(11,999)
TOTAL			323	60	1,347	35,713	(37,000)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season (April-October).

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Anderson Cottonwood Irrigation District – 2014 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	86,702
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,570
Available Soil Moisture ^c	Estimated	1,502
	Total Water Supplies =	89,774
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	35,713
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,287
Riparian ET ^d (Canals/Laterals)	Estimated	1,148
Conveyance System Filling ^e (Canals/Laterals)	Estimated	867
	Total Distribution System =	39,015
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	27,124
Evapotranspiration of Precip - ET _{pr}	Table 5	139
Cultural Practices (includes Leaching Requirement)	Table 5	475
	Total Crop Water Needs =	27,739
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Upslope Drainwater Flow Through ^h	Estimated	0
Remainder Drainwater Outflow ⁱ	District Records	1,240
	Total District Outflow (from District Records) =	1,240
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	3,215
	Percolation from Agricultural Lands^l (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	21,780

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs. Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on crop acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for cultural practices.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^lPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Anderson Cottonwood Irrigation District

TABLE 7

**Anderson Cottonwood Irrigation District – 2014 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2005	102,018	-	-	-	102,018	3,214	3,948
2006	93,168	-	-	-	93,168	2,935	3,606
2007	111,903	-	-	-	111,903	3,525	4,331
2008	109,864	-	-	-	109,864	3,464	4,252
2009	106,922	-	-	-	106,922	3,368	4,138
2010	100,009	0	0	0	100,009	3,151	15,000
2011	89,814	0	0	0	89,814	3,150	15,000
2012	101,229	0	0	0	101,229	3,239	15,000
2013	108,600	0	0	0	108,600	3,340	2,755
2014	86,702	0	0	0	86,702	3,215	1,240
Total	923,527	0	0	0	923,527	29,386	68,029
Average	102,614	0	0	0	102,614	3,265	7,559

^aFederal Ag Water Supply from Reclamation Water Account Records. Data prior to 2011 are not available.^bNon-Federal Ag Water Supply from District Records. Data prior to 2011 are not available.^cEstimated by District based on observation and historical information. Data prior to 2011 are not available.^dEstimated by District based on observation and historical information.

Anderson Cottonwood Irrigation District

TABLE 1

**Anderson Cottonwood Irrigation District – 2015 Surface Water Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	8,849	0	0	0	8,849
May	17,213	0	0	0	17,213
June	15,125	0	0	0	15,125
July	16,281	0	0	0	16,281
August	15,495	0	0	0	15,495
September	14,179	0	0	0	14,179
October	173	0	0	0	173
TOTAL	87,315	0	0	0	87,315

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Anderson Cottonwood Irrigation District – 2015 Groundwater Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
TOTAL	0	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Anderson Cottonwood Irrigation District – 2015 Total District Water Supply (excluding reuse)
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	8,849	0	8,849
May	17,213	0	17,213
June	15,125	0	15,125
July	16,281	0	16,281
August	15,495	0	15,495
September	14,179	0	14,179
October	173	0	173
TOTAL	87,315	0	87,315

^aIn addition to the water supplies shown in Table 3, 3,350 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Anderson Cottonwood Irrigation District

Anderson Cottonwood Irrigation District – 2015 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.00	1.9	0.16
Feb	1.7	0.15	2.7	0.22
Mar	0.1	0.01	4.5	0.38
Apr	1.3	0.11	6.7	0.56
May	0.0	0.00	8.2	0.68
Jun	0.0	0.00	9.6	0.80
Jul	0.0	0.00	9.2	0.77
Aug	0.0	0.00	7.9	0.66
Sept	0.1	0.00	5.6	0.47
Oct	0.2	0.02	4.4	0.36
Nov	1.4	0.12	2.4	0.20
Dec	1.4	0.12	1.1	0.09
TOTAL-YR	6.3	0.53	64.1	5.34
TOTAL-Apr-Oct	1.6	0.13	51.5	4.30

^aPrecipitation is precipitation reported for CIMIS Station at Gerber South (#222).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the reference ET (ETo) reported for the Gerber South CIMIS Station.

TABLE 4

Anderson Cottonwood Irrigation District – 2015 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	177,952	30	123	16	526	24,511	(25,022)
Laterals	871,324	10	200	26	859	11,202	(12,035)
TOTAL			323	42	1,386	35,713	(37,056)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season (April-October).

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Anderson Cottonwood Irrigation District

TABLE 6

Anderson Cottonwood Irrigation District – 2015 District Water Balance (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	87,315
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,123
Available Soil Moisture ^c	Estimated	423
	Total Water Supplies =	88,861
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	35,713
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,343
Riparian ET ^d (Canals/Laterals)	Estimated	1,361
Conveyance System Filling ^e (Canals/Laterals)	Estimated	873
	Total Distribution System =	39,290
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	27,434
Evapotranspiration of Precip - ET _{pr}	Table 5	347
Cultural Practices (includes Leaching Requirement)	Table 5	497
	Total Crop Water Needs =	28,278
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Upslope Drainwater Flow Through ^h	Estimated	0
Remainder Drainwater Outflow ⁱ	District Records	1,150
	Total District Outflow (from District Records) =	1,150
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	3,350
Percolation from Agricultural Lands^j (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		20,143

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs. Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on crop acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for cultural practices.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^jPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Anderson Cottonwood Irrigation District

TABLE 7

**Anderson Cottonwood Irrigation District – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2006	93,168	-	-	-	93,168	2,935	3,606
2007	111,903	-	-	-	111,903	3,525	4,331
2008	109,864	-	-	-	109,864	3,464	4,252
2009	106,922	-	-	-	106,922	3,368	4,138
2010	100,009	-	-	-	100,009	3,151	15,000
2011	89,814	0	0	0	89,814	3,150	15,000
2012	101,229	0	0	0	101,229	3,239	15,000
2013	108,600	0	0	0	108,600	3,340	2,755
2014	86,702	0	0	0	86,702	3,215	1,240
2015	87,315	0	0	0	87,315	3,350	1,150
Total	995,526	0	0	0	995,526	32,737	66,471
Average	99,553	0	0	0	99,553	3,274	6,647

^aFederal Ag Water Supply from Reclamation Water Account Records. Data prior to 2011 are not available.^bNon-Federal Ag Water Supply from District Records. Data prior to 2011 are not available.^cEstimated by District based on observation and historical information. Data prior to 2011 are not available.^dEstimated by District based on observation and historical information.

Glenn-Colusa Irrigation District

Glenn-Colusa Irrigation District

TABLE 1

**Glenn-Colusa Irrigation District – 2013 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	86,278	0	0	400	86,678
May	153,331	0	0	250	153,581
June	165,897	0	0	200	166,097
July	128,187	41,238	0	200	169,625
August	88,326	31,036	0	200	119,562
September	21,071	0	0	200	21,271
October	55,535	0	0	200	55,735
TOTAL	698,625	72,274	0	1,650	772,549

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Glenn-Colusa Irrigation District – 2013 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	1,367
May	0	1,542
June	0	1,719
July	1,775	1,826
August	1,799	2,153
September	1,426	933
October	0	594
TOTAL	5,000	10,134

^aEstimated by District based on observation and historical information.

TABLE 3

**Glenn-Colusa Irrigation District – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	86,678	0	86,678
May	153,581	0	153,581
June	166,097	0	166,097
July	169,625	1,775	171,400
August	119,562	1,799	121,361
September	21,271	1,426	22,697
October	55,735	0	55,735
TOTAL	772,549	5,000	777,549

^aIn addition to the water supplies shown in Table 3, 217,694 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Glenn-Colusa Irrigation District

Glenn-Colusa Irrigation District – 2013 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2013	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.9	0.07	1.7	0.14
Feb	0.2	0.02	2.9	0.25
Mar	1.2	0.10	4.4	0.37
Apr	0.7	0.06	7.4	0.62
May	0.1	0.01	8.3	0.69
Jun	0.2	0.02	8.3	0.69
Jul	0.0	0.00	9.0	0.75
Aug	0.0	0.00	7.6	0.63
Sept	0.6	0.05	5.7	0.48
Oct	0.0	0.00	4.6	0.39
Nov	0.9	0.07	2.8	0.23
Dec	0.3	0.02	2.1	0.18
TOTAL-YR	5.1	0.42	64.8	5.40
TOTAL-Apr-Oct	1.6	0.13	50.9	4.24

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Glenn-Colusa Irrigation District – 2013 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	341,200	70	548	72	2,324	10,966	(13,218)
Pipeline	26,400	2	0	0	0	0	0
Laterals	3,495,360	12	963	126	4,081	4,815	(8,770)
Watershed Drains	2,919,840	15	1,005	132	4,262	5,027	(9,157)
TOTAL			2,517	330	10,667	20,808	(31,145)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Glenn-Colusa Irrigation District

TABLE 6

**Glenn-Colusa Irrigation District – 2013 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	777,549
Private Groundwater	Table 2	10,134
Inflow From Precip ^b	Estimated	17,395
Available Soil Moisture ^c	Estimated	1,629
Total Water Supplies =		806,707
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	20,808
Evaporation - Precipitation (Canals/Laterals)	Table 4	10,337
Riparian ET ^d (Canals/Laterals)	Estimated	6,450
Conveyance System Filling ^e (Canals/Laterals)	Estimated	8,000
Total Distribution System =		45,595
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	416,002
Evapotranspiration of Precip - ET _{pr}	Table 5	2,285
Cultural Practices (includes Leaching Requirement)	Table 5	9,642
Total Crop Water Needs =		427,928
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	35,556
Irrigation Season Rainfall Runoff ^g	Estimated	13,992
Rice Cultural and Ecosystem Requirement ^h	Estimated	106,720
Upslope Drainwater Flow Through ⁱ	Estimated	425
Remainder Drainwater Outflow ^j	Calculated	50,461
Total District Outflow (from District Records) =		207,154
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	217,694
Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		126,030

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Glenn-Colusa Irrigation District

TABLE 7

**Glenn-Colusa Irrigation District – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow (acre-feet)
2004	665,314	59,491	0	22,500	747,305	179,137	227,987
2005	581,437	77,072	0	22,500	681,009	144,819	223,045
2006	538,589	77,144	0	22,500	638,233	159,934	220,871
2007	635,209	52,485	0	22,500	710,194	185,560	219,207
2008	691,219	55,423	0	22,500	769,142	204,255	183,373
2009	636,777	49,911	0	22,500	709,188	190,980	171,743
2010	572,352	91,017	0	22,500	685,869	194,677	229,665
2011	571,617	86,014	0	40,500	698,131	190,994	255,999
2012	605,963	90,277	0	40,500	736,740	206,542	197,899
2013	698,625	72,274	0	1,650	772,549	217,694	207,154
Total	6,197,102	711,108	0	240,150	7,148,360	1,874,592	2,136,943
Average	619,710	71,111	0	24,015	714,836	187,459	213,694

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013.

Glenn-Colusa Irrigation District

TABLE 1

**Glenn-Colusa Irrigation District – 2014 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	14,848	0	0	350	15,198
May	127,415	0	0	300	127,715
June	133,613	0	0	250	133,863
July	112,864	19,188	0	200	132,252
August	64,606	32,983	0	200	97,789
September	26,531	0	0	200	26,731
October	17,038	0	0	200	17,238
TOTAL	496,915	52,171	0	1,700	550,786

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Glenn-Colusa Irrigation District – 2014 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	1,117
May	459	1,675
June	0	2,234
July	0	2,234
August	0	1,675
September	0	1,117
October	0	1,117
TOTAL	459	11,169

^aEstimated by District based on observation and historical information.

TABLE 3

**Glenn-Colusa Irrigation District – 2014 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	15,198	0	15,198
May	127,715	459	128,174
June	133,863	0	133,863
July	132,252	0	132,252
August	97,789	0	97,789
September	26,731	0	26,731
October	17,238	0	17,238
TOTAL	550,786	459	551,245

^aIn addition to the water supplies shown in Table 3, 131,520 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Glenn-Colusa Irrigation District

Glenn-Colusa Irrigation District – 2014 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.02	2.4	0.20
Feb	3.7	0.31	2.0	0.17
Mar	1.6	0.14	4.1	0.34
Apr	1.2	0.10	5.9	0.49
May	0.1	0.01	8.4	0.70
Jun	0.0	0.00	9.1	0.76
Jul	0.0	0.00	8.9	0.74
Aug	0.1	0.01	7.3	0.61
Sept	0.4	0.03	5.8	0.48
Oct	0.3	0.03	4.1	0.34
Nov	1.2	0.10	1.8	0.15
Dec	7.3	0.60	1.1	0.09
TOTAL-YR	16.0	1.33	60.9	5.07
TOTAL-Apr-Oct	2.1	0.17	49.5	4.13

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Glenn-Colusa Irrigation District – 2014 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	341,200	70	548	94	2,262	10,966	(13,134)
Pipeline	26,400	2	0	0	0	0	0
Laterals	3,495,360	12	963	165	3,972	4,815	(8,621)
Watershed Drains	2,919,840	15	1,005	173	4,148	5,027	(9,002)
TOTAL			2,517	432	10,381	20,808	(30,757)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6
Glenn-Colusa Irrigation District – 2014 District Water Balance
(April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation) ^a		
District Water Supply (includes District Groundwater)	Table 3	551,245
Private Groundwater	Table 2	11,169
Inflow From Precip ^b	Estimated	19,622
Available Soil Moisture ^c	Estimated	3,531
	Total Water Supplies =	585,567
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	20,808
Evaporation - Precipitation (Canals/Laterals)	Table 4	9,949
Riparian ET ^d (Canals/Laterals)	Estimated	6,450
Conveyance System Filling ^e (Canals/Laterals)	Estimated	8,000
	Total Distribution System =	45,207
Crop Consumptive Use Water Needs ^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	339,415
Evapotranspiration of Precip - ET _{pr}	Table 5	3,754
Cultural Practices (includes Leaching Requirement)	Table 5	8,225
	Total Crop Water Needs =	351,394
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	9,402
Irrigation Season Rainfall Runoff ^g	Estimated	15,772
Rice Cultural and Ecosystem Requirement ^h	Estimated	45,000
Upslope Drainwater Flow Through ⁱ	Estimated	450
Remainder Drainwater Outflow ^j	Calculated	31,544
	Total District Outflow (from District Records) =	102,168
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	131,520
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	86,798

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Glenn-Colusa Irrigation District

TABLE 7

**Glenn-Colusa Irrigation District – 2014 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow (acre-feet)
2005	581,437	77,072	0	22,500	681,009	144,819	223,045
2006	538,589	77,144	0	22,500	638,233	159,934	220,871
2007	635,209	52,485	0	22,500	710,194	185,560	219,207
2008	691,219	55,423	0	22,500	769,142	204,255	183,373
2009	636,777	49,911	0	22,500	709,188	190,980	171,743
2010	572,352	91,017	0	22,500	685,869	194,677	229,665
2011	571,617	86,014	0	40,500	698,131	190,994	255,999
2012	605,963	90,277	0	40,500	736,740	206,542	197,899
2013	698,625	72,274	0	1,650	772,549	217,694	207,154
2014	496,915	52,171	0	1,700	550,786	131,520	102,168
Total	5,531,788	651,617	0	217,650	6,401,055	1,695,455	1,908,956
Average	614,643	72,402	0	24,183	711,228	188,384	212,106

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013.

Glenn-Colusa Irrigation District

TABLE 1

**Glenn-Colusa Irrigation District – 2015 Surface Water Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	37,770	0	0	300	38,070
May	113,870	0	0	150	114,020
June	109,766	0	0	200	109,966
July	88,171	29,974	0	180	118,325
August	53,030	30,407	0	180	83,617
September	19,498	0	0	150	19,648
October ^d	30,576	0	0	200	30,776
TOTAL	452,681	60,381	0	1,360	514,422

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.^dQuantities include water diverted under the extension of the contract season during November - December 10.

TABLE 2

**Glenn-Colusa Irrigation District – 2015 Groundwater Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	2,784
May	0	8,394
June	929	12,366
July	795	8,761
August	0	5,184
September	0	2,564
October	0	1,784
TOTAL	1,724	41,837

^aEstimated by District based on observation and historical information.

TABLE 3

**Glenn-Colusa Irrigation District – 2015 Total District Water Supply (excluding reuse)
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	38,070	0	38,070
May	114,020	0	114,020
June	109,966	929	110,895
July	118,325	795	119,120
August	83,617	0	83,617
September	19,648	0	19,648
October	30,776	0	30,776
TOTAL	514,422	1,724	516,146

^aIn addition to the water supplies shown in Table 3, 115,694 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Glenn-Colusa Irrigation District

Glenn-Colusa Irrigation District – 2015 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.01	1.3	0.11
Feb	2.1	0.18	2.3	0.19
Mar	0.2	0.02	4.6	0.38
Apr	1.1	0.09	6.6	0.55
May	0.0	0.00	7.5	0.62
Jun	0.0	0.00	8.6	0.72
Jul	0.0	0.00	8.8	0.73
Aug	0.0	0.00	7.8	0.65
Sept	0.0	0.00	5.7	0.48
Oct	0.1	0.01	4.3	0.36
Nov	1.7	0.14	2.2	0.19
Dec	1.3	0.11	1.3	0.11
TOTAL-YR	6.7	0.56	61.0	5.08
TOTAL-Apr-Oct	1.3	0.10	49.3	4.10

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Glenn-Colusa Irrigation District – 2015 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	341,200	70	548	57	2,251	10,966	(13,160)
Pipeline	26,400	2	0	0	0	0	0
Laterals	3,495,360	12	963	100	3,953	4,815	(8,667)
Watershed Drains	2,919,840	15	1,005	105	4,127	5,027	(9,050)
TOTAL			2,517	262	10,330	20,808	(30,876)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Glenn-Colusa Irrigation District

TABLE 6
Glenn-Colusa Irrigation District – 2015 District Water Balance
(April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	516,146
Private Groundwater	Table 2	41,837
Inflow From Precip ^b	Estimated	11,063
Available Soil Moisture ^c	Estimated	1,505
	Total Water Supplies =	570,551
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	20,808
Evaporation - Precipitation (Canals/Laterals)	Table 4	10,068
Riparian ET ^d (Canals/Laterals)	Estimated	6,450
Conveyance System Filling ^e (Canals/Laterals)	Estimated	8,000
	Total Distribution System =	45,326
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	317,791
Evapotranspiration of Precip - ET _{pr}	Table 5	3,811
Cultural Practices (includes Leaching Requirement)	Table 5	8,350
	Total Crop Water Needs =	329,952
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	16,855
Irrigation Season Rainfall Runoff ^g	Estimated	8,412
Rice Cultural and Ecosystem Requirement ^h	Estimated	50,000
Upslope Drainwater Flow Through ⁱ	Estimated	325
Remainder Drainwater Outflow ^j	Calculated	3,646
	Total District Outflow (from District Records) =	79,238
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	115,694
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	116,035

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Glenn-Colusa Irrigation District

TABLE 7

**Glenn-Colusa Irrigation District – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow (acre-feet)
2006	538,589	77,144	0	22,500	638,233	159,934	220,871
2007	635,209	52,485	0	22,500	710,194	185,560	219,207
2008	691,219	55,423	0	22,500	769,142	204,255	183,373
2009	636,777	49,911	0	22,500	709,188	190,980	171,743
2010	572,352	91,017	0	22,500	685,869	194,677	229,665
2011	571,617	86,014	0	40,500	698,131	190,994	255,999
2012	605,963	90,277	0	40,500	736,740	206,542	197,899
2013	698,625	72,274	0	1,650	772,549	217,694	207,154
2014	496,915	52,171	0	1,700	550,786	131,520	102,168
2015	452,681	60,381	0	1,360	514,422	115,694	79,238
Total	5,899,947	687,097	0	198,210	6,785,254	1,797,850	1,867,317
Average	589,995	68,710	0	19,821	678,525	179,785	186,732

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013.

Provident Irrigation District

Provident Irrigation District

TABLE 1

**Provident Irrigation District – 2013 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	7,137	0	1,177	2,945	11,259
May	8,144	0	2,773	7,281	18,198
June	10,036	0	5,517	10,441	25,994
July	6,300	2,008	5,828	12,086	26,222
August	2,500	421	3,669	10,498	17,088
September	37	0	1,381	2,108	3,526
October	0	0	1,850	1,924	3,774
TOTAL	34,154	2,429	22,195	47,283	106,061

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Provident Irrigation District – 2013 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	535	0
May	245	43
June	29	0
July	47	0
August	0	0
September	0	0
October	0	0
TOTAL	856	43

^aEstimated by District based on observation and historical information.

TABLE 3

**Provident Irrigation District – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	11,259	535	11,794
May	18,198	245	18,443
June	25,994	29	26,023
July	26,222	47	26,269
August	17,088	0	17,088
September	3,526	0	3,526
October	3,774	0	3,774
TOTAL	106,061	856	106,917

^aIn addition to the water supplies shown in Table 3, 6,022 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Provident Irrigation District

TABLE 6

**Provident Irrigation District – 2013 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	106,917
Private Groundwater	Table 2	43
Inflow From Precip ^b	Estimated	1,982
Available Soil Moisture ^c	Estimated	0
	Total Water Supplies =	108,942
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	2,186
Evaporation - Precipitation (Canals/Laterals)	Table 4	698
Riparian ET ^d (Canals/Laterals)	Estimated	100
Conveyance System Filling ^e (Canals/Laterals)	Estimated	1,061
	Total Distribution System =	4,044
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	51,128
Evapotranspiration of Precip - ET _{pr}	Table 5	330
Cultural Practices (includes Leaching Requirement)	Table 5	907
	Total Crop Water Needs =	52,365
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	1,982
Rice Cultural and Ecosystem Requirement ^h	Estimated	15,118
Upslope Drainwater Flow Through	Estimated	10,334
Remainder Drainwater Outflow ⁱ	Calculated	3,060
	Total District Outflow (from District Records) =	30,493
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	6,022
Percolation from Agricultural Lands^j (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		22,040

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^jPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Provident Irrigation District

TABLE 7

**Provident Irrigation District – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^{b,c}	Upslope Drainwater ^{c,d}	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^d (acre-feet)
2004	45,948	0	12,931	-	58,879	-	-
2005	35,050	4,500	7,028	-	46,578	-	-
2006	33,282	4,500	5,597	-	43,379	-	-
2007	39,263	3,385	8,779	-	51,427	-	-
2008	47,280	1,747	0	-	49,027	-	-
2009	35,471	4,500	11,883	-	51,854	-	-
2010	31,879	4,500	6,727	70,534	113,640	10,233	49,935
2011	26,671	3,346	6,619	73,953	110,589	9,983	53,382
2012	31,466	3,278	27,068	23,651	85,463	9,210	25,268
2013	34,154	2,429	22,195	47,283	106,061	6,022	30,493
Total	360,464	32,185	108,827	215,421	716,897	35,448	159,077
Average	36,046	3,219	10,883	53,855	71,690	8,862	39,769

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013.^dData prior to 2010 are not available.

Provident Irrigation District

TABLE 1

**Provident Irrigation District – 2014 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	350	40	0	56	446
May	6,300	0	2,798	5,352	14,450
June	5,202	0	0	7,026	12,228
July	6,176	0	0	8,740	14,916
August	2,077	0	0	8,389	10,466
September	0	0	0	0	0
October	7,742	0	0	775	8,517
TOTAL	27,847	40	2,798	30,338	61,023

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Provident Irrigation District – 2014 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	931	0
June	157	0
July	56	0
August	20	0
September	0	0
October	1,128	0
TOTAL	2,292	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Provident Irrigation District – 2014 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	446	0	446
May	14,450	931	15,381
June	12,228	157	12,385
July	14,916	56	14,972
August	10,466	20	10,486
September	0	0	0
October	8,517	1,128	9,645
TOTAL	61,023	2,292	63,315

^aIn addition to the water supplies shown in Table 3, 2,617 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Provident Irrigation District

Provident Irrigation District – 2014 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.02	2.4	0.20
Feb	3.7	0.31	2.0	0.17
Mar	1.6	0.14	4.1	0.34
Apr	1.2	0.10	5.9	0.49
May	0.1	0.01	8.4	0.70
Jun	0.0	0.00	9.1	0.76
Jul	0.0	0.00	8.9	0.74
Aug	0.1	0.01	7.3	0.61
Sept	0.4	0.03	5.8	0.48
Oct	0.3	0.03	4.1	0.34
Nov	1.2	0.10	1.8	0.15
Dec	7.3	0.60	1.1	0.09
TOTAL-YR	16	1.33	60.9	5.07
TOTAL-Apr-Oct	2.1	0.17	49.5	4.13

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Provident Irrigation District – 2014 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	65,472	35	53	9	217	1,315	(1,523)
Laterals	206,448	12	57	10	235	569	(794)
Water Shed Drains	175,276	15	60	10	249	302	(540)
TOTAL			170	29	701	2,186	(2,857)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season (April-October).

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Provident Irrigation District – 2014 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	63,315
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,615
Available Soil Moisture ^c	Estimated	0
	Total Water Supplies =	64,930
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	2,186
Evaporation - Precipitation (Canals/Laterals)	Table 4	671
Riparian ET ^d (Canals/Laterals)	Estimated	100
Conveyance System Filling ^e (Canals/Laterals)	Estimated	610
	Total Distribution System =	3,567
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	32,284
Evapotranspiration of Precip - ET _{pr}	Table 5	558
Cultural Practices (includes Leaching Requirement)	Table 5	564
	Total Crop Water Needs =	33,406
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	1,615
Rice Cultural and Ecosystem Requirement ^h	Estimated	9,407
Upslope Drainwater Flow Through	Estimated	6,217
Remainder Drainwater Outflow ⁱ	Calculated	3,379
	Total District Outflow (from District Records) =	20,618
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	2,617
	Percolation from Agricultural Lands^j (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	7,339

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomposition acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^jPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Provident Irrigation District

TABLE 7

**Provident Irrigation District – 2014 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^{b,c}	Upslope Drainwater ^{c,d}	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^d (acre-feet)
2005	35,050	4,500	7,028	-	46,578	-	-
2006	33,282	4,500	5,597	-	43,379	-	-
2007	39,263	3,385	8,779	-	51,427	-	-
2008	47,280	1,747	0	-	49,027	-	-
2009	35,471	4,500	11,883	-	51,854	-	-
2010	31,879	4,500	6,727	70,534	113,640	10,233	49,935
2011	26,671	3,346	6,619	73,953	110,589	9,983	53,382
2012	31,466	3,278	27,068	23,651	85,463	9,210	25,268
2013	34,154	2,429	22,195	47,283	106,061	6,022	30,493
2014	27,847	40	2,798	30,338	61,023	2,617	20,618
Total	314,516	32,185	95,896	215,421	658,018	35,448	159,077
Average	34,946	3,576	10,655	53,855	73,113	8,862	39,769

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013.^dData prior to 2010 are not available.

Provident Irrigation District

TABLE 1

**Provident Irrigation District – 2015 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	2,331	0	273	527	3,131
May	6,734	0	0	5,338	12,072
June	6,720	0	0	6,103	12,823
July	6,001	0	0	8,427	14,428
August	2,332	0	0	7,209	9,541
September	0	0	0	1,267	1,267
October ^d	8,712	0	0	623	9,335
TOTAL	32,830	0	273	29,494	62,597

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.^dQuantities include water diverted under the extension of the contract season during November - December 10.

TABLE 2

**Provident Irrigation District – 2015 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	436	0
May	682	0
June	832	0
July	197	0
August	0	0
September	0	0
October	1,146	0
TOTAL	3,293	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Provident Irrigation District – 2015 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	3,131	436	3,567
May	12,072	682	12,754
June	12,823	832	13,655
July	14,428	197	14,625
August	9,541	0	9,541
September	1,267	0	1,267
October	9,335	1,146	10,481
TOTAL	62,597	3,293	65,890

^aIn addition to the water supplies shown in Table 3, 6,619 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Provident Irrigation District

Provident Irrigation District – 2015 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.01	1.3	0.11
Feb	2.1	0.18	2.3	0.19
Mar	0.2	0.02	4.6	0.38
Apr	1.1	0.09	6.6	0.55
May	0.0	0.00	7.5	0.62
Jun	0.0	0.00	8.6	0.72
Jul	0.0	0.00	8.8	0.73
Aug	0.0	0.00	7.8	0.65
Sept	0.0	0.00	5.7	0.48
Oct	0.1	0.01	4.3	0.36
Nov	1.7	0.14	2.2	0.19
Dec	1.3	0.11	1.3	0.11
TOTAL-YR	6.7	0.56	61.0	5.08
TOTAL-Apr-Oct	1.3	0.10	49.3	4.10

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Provident Irrigation District – 2015 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	65,472	35	53	5	216	1,315	(1,526)
Laterals	206,448	12	57	6	233	569	(796)
Water Shed Drains	175,276	15	60	6	248	302	(543)
TOTAL			170	18	697	2,186	(2,865)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season (April-October).

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Provident Irrigation District

TABLE 6

**Provident Irrigation District – 2015 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation) ^a		
District Water Supply (includes District Groundwater)	Table 3	65,890
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,080
Available Soil Moisture ^c	Estimated	0
	Total Water Supplies =	66,970
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	2,186
Evaporation - Precipitation (Canals/Laterals)	Table 4	679
Riparian ET ^d (Canals/Laterals)	Estimated	100
Conveyance System Filling ^e (Canals/Laterals)	Estimated	626
	Total Distribution System =	3,591
Crop Consumptive Use Water Needs ^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	34,888
Evapotranspiration of Precip - ET _{pr}	Table 5	562
Cultural Practices (includes Leaching Requirement)	Table 5	622
	Total Crop Water Needs =	36,072
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	1,080
Rice Cultural and Ecosystem Requirement ^h	Estimated	10,371
Upslope Drainwater Flow Through	Estimated	5,984
Remainder Drainwater Outflow ⁱ	Calculated	5,044
	Total District Outflow (from District Records) =	22,479
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	6,619
	Percolation from Agricultural Lands^j (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	4,828

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^jPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Provident Irrigation District

TABLE 7

**Provident Irrigation District – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^{b,c} (acre-feet)	Upslope Drainwater ^{c,d} (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^d (acre-feet)
2006	33,282	4,500	5,597	-	43,379	-	-
2007	39,263	3,385	8,779	-	51,427	-	-
2008	47,280	1,747	0	-	49,027	-	-
2009	35,471	4,500	11,883	-	51,854	-	-
2010	31,879	4,500	6,727	70,534	113,640	10,233	49,935
2011	26,671	3,346	6,619	73,953	110,589	9,983	53,382
2012	31,466	3,278	27,068	23,651	85,463	9,210	25,268
2013	34,154	2,429	22,195	47,283	106,061	6,022	30,493
2014	27,847	40	2,798	30,338	61,023	2,617	20,618
2015	32,830	0	273	29,494	62,597	6,619	22,479
Total	340,143	27,725	91,939	275,253	735,060	44,684	202,175
Average	34,014	2,773	9,194	45,876	73,506	7,447	33,696

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013.^dData prior to 2010 are not available.

Princeton-Codora-Glenn
Irrigation District

Princeton-Codora-Glenn Irrigation District

TABLE 1

**Princeton-Codora-Glenn Irrigation District – 2013 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	8,136	0	408	408	8,952
May	11,644	0	2,664	2,664	16,972
June	11,556	164	4,401	4,401	20,522
July	6,740	4,124	0	5,375	16,239
August	2,780	5,943	0	3,980	12,703
September	1,229	0	3,980	0	5,209
October	5,805	0	0	0	5,805
TOTAL	47,890	10,231	11,453	16,828	86,402

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Princeton-Codora-Glenn Irrigation District – 2013 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	295	0
June	556	0
July	1,323	0
August	422	0
September	0	0
October	0	0
TOTAL	2,596	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Princeton-Codora-Glenn Irrigation District – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	8,952	0	8,952
May	16,972	295	17,267
June	20,522	556	21,078
July	16,239	1,323	17,562
August	12,703	422	13,125
September	5,209	0	5,209
October	5,805	0	5,805
TOTAL	86,402	2,596	88,998

^aIn addition to the water supplies shown in Table 3, 7,383 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Princeton-Codora-Glenn Irrigation District

Princeton-Codora-Glenn Irrigation District – 2013 Distribution System Evaporation and Seepage Worksheet 2015 Sacramento Valley Regional Water Management Plan Annual Update

2013	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.9	0.07	1.7	0.14
Feb	0.2	0.02	2.9	0.25
Mar	1.2	0.10	4.4	0.37
Apr	0.7	0.06	7.4	0.62
May	0.1	0.01	8.3	0.69
Jun	0.2	0.02	8.3	0.69
Jul	0.0	0.00	9.0	0.75
Aug	0.0	0.00	7.6	0.63
Sept	0.6	0.05	5.7	0.48
Oct	0.0	0.00	4.6	0.39
Nov	0.9	0.07	2.8	0.23
Dec	0.3	0.02	2.1	0.18
TOTAL-YR	5.1	0.42	64.8	5.40
TOTAL-Apr-Oct	1.6	0.13	50.9	4.24

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Princeton-Codora-Glenn Irrigation District – 2013 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	68,640	30	47	6	200	11,818	(12,012)
Laterals	219,384	15	76	10	320	5,666	(5,976)
Water Shed Drains	113,520	15	39	5	166	1,955	(2,115)
TOTAL			162	21	686	19,439	(20,104)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Princeton-Codora-Glenn Irrigation District

TABLE 6

**Princeton-Codora-Glenn Irrigation District – 2013 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	88,998
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,233
Available Soil Moisture ^c	Estimated	102
	Total Water Supplies =	90,333
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	19,439
Evaporation - Precipitation (Canals/Laterals)	Table 4	665
Riparian ET ^d (Canals/Laterals)	Estimated	100
Conveyance System Filling ^e (Canals/Laterals)	Estimated	864
	Total Distribution System =	21,068
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	29,599
Evapotranspiration of Precip - ET _{pr}	Table 5	152
Cultural Practices (includes Leaching Requirement)	Table 5	716
	Total Crop Water Needs =	30,467
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	1,024
Rice Cultural and Ecosystem Requirement ^h	Estimated	7,812
Upslope Drainwater Flow Through	Estimated	8,414
Remainder Drainwater Outflow ⁱ	Calculated	496
	Total District Outflow (from District Records) =	17,747
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	7,383
	Percolation from Agricultural Lands^j (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	21,052

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^jPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for

Princeton-Codora-Glenn Irrigation District

TABLE 7

**Princeton-Codora-Glenn Irrigation District – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^c (acre-feet)
2004	50,181	10,991	0	-	61,172	9,156	-
2005	44,961	15,659	0	-	60,620	7,088	-
2006	40,671	14,600	0	-	55,271	4,860	-
2007	50,875	14,800	0	-	65,675	5,276	-
2008	52,810	16,398	0	-	69,208	5,682	-
2009	50,800	13,847	0	-	64,647	6,078	-
2010	44,869	14,428	0	23,736	83,033	5,531	27,428
2011	38,257	12,485	0	26,189	76,931	7,664	26,460
2012	43,303	12,950	17,908	12,856	87,017	8,702	26,388
2013	47,890	10,231	11,453	16,828	86,402	7,383	17,747
Total	464,617	136,389	29,361	79,609	709,976	67,420	98,022
Average	46,462	13,639	2,936	19,902	70,998	6,742	24,506

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information. Data prior to 2010 are not available.^dEstimated by District based on observation and historical information.

Princeton-Codora-Glenn Irrigation District

TABLE 1

**Princeton-Codora-Glenn Irrigation District – 2014 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	352	0	0	0	352
May	10,507	0	1,084	1,804	13,395
June	7,807	0	0	1,917	9,724
July	9,939	0	0	2,398	12,337
August	5,856	2,789	0	3,147	11,792
September	1,503	0	0	294	1,797
October	2,425	0	0	0	2,425
TOTAL	38,389	2,789	1,084	9,560	51,822

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Princeton-Codora-Glenn Irrigation District – 2014 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	569	0
May	1,470	0
June	1,488	0
July	544	0
August	279	0
September	0	0
October	688	0
TOTAL	5,038	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Princeton-Codora-Glenn Irrigation District – 2014 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	352	569	921
May	13,395	1,470	14,865
June	9,724	1,488	11,212
July	12,337	544	12,881
August	11,792	279	12,071
September	1,797	0	1,797
October	2,425	688	3,113
TOTAL	51,822	5,038	56,860

^aIn addition to the water supplies shown in Table 3, 3,138 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Princeton-Codora-Glenn Irrigation District

Princeton-Codora-Glenn Irrigation District – 2014 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.02	2.4	0.20
Feb	3.7	0.31	2.0	0.17
Mar	1.6	0.14	4.1	0.34
Apr	1.2	0.10	5.9	0.49
May	0.1	0.01	8.4	0.70
Jun	0.0	0.00	9.1	0.76
Jul	0.0	0.00	8.9	0.74
Aug	0.1	0.01	7.3	0.61
Sept	0.4	0.03	5.8	0.48
Oct	0.3	0.03	4.1	0.34
Nov	1.2	0.10	1.8	0.15
Dec	7.3	0.60	1.1	0.09
TOTAL-YR	16	1.33	60.9	5.07
TOTAL-Apr-Oct	2.1	0.17	49.5	4.13

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Princeton-Codora-Glenn Irrigation District – 2014 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	68,640	30	47	8	195	11,818	(12,005)
Laterals	219,384	15	76	13	312	5,666	(5,965)
Water Shed Drains	113,520	15	39	7	161	1,955	(2,109)
TOTAL			162	28	668	19,439	(20,079)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Princeton-Codora-Glenn Irrigation District – 2014 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	56,860
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,213
Available Soil Moisture ^c	Estimated	267
	Total Water Supplies =	58,340
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	19,439
Evaporation - Precipitation (Canals/Laterals)	Table 4	640
Riparian ET ^d (Canals/Laterals)	Estimated	100
Conveyance System Filling ^e (Canals/Laterals)	Estimated	518
	Total Distribution System =	20,697
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	21,784
Evapotranspiration of Precip - ET _{pr}	Table 5	265
Cultural Practices (includes Leaching Requirement)	Table 5	564
	Total Crop Water Needs =	22,612
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	930
Rice Cultural and Ecosystem Requirement ^h	Estimated	5,420
Upslope Drainwater Flow Through	Estimated	4,780
Remainder Drainwater Outflow ⁱ	Calculated	1,084
	Total District Outflow (from District Records) =	12,215
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	3,138
	Percolation from Agricultural Lands^j (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	2,816

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^jPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Princeton-Codora-Glenn Irrigation District

TABLE 7

**Princeton-Codora-Glenn Irrigation District – 2014 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^c (acre-feet)
2005	44,961	15,659	0	-	60,620	7,088	-
2006	40,671	14,600	0	-	55,271	4,860	-
2007	50,875	14,800	0	-	65,675	5,276	-
2008	52,810	16,398	0	-	69,208	5,682	-
2009	50,800	13,847	0	-	64,647	6,078	-
2010	44,869	14,428	0	23,736	83,033	5,531	27,428
2011	38,257	12,485	0	26,189	76,931	7,664	26,460
2012	43,303	12,950	17,908	12,856	87,017	8,702	26,388
2013	47,890	10,231	11,453	16,828	86,402	7,383	17,747
2014	38,389	2,789	1,084	9,560	51,822	3,138	12,215
Total	414,436	125,398	29,361	79,609	648,804	58,264	98,023
Average	46,048	13,933	3,262	19,902	72,089	6,474	24,506

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information. Data prior to 2010 are not available.^dEstimated by District based on observation and historical information.

Princeton-Codora-Glenn Irrigation District

TABLE 1

**Princeton-Codora-Glenn Irrigation District – 2015 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	2,409	0	99	99	2,607
May	10,278	0	0	2,071	12,349
June	8,990	0	0	3,276	12,266
July	10,073	0	0	4,023	14,096
August	2,287	6,457	0	2,555	11,299
September	999	0	0	88	1,087
October	3,852	0	0	412	4,264
TOTAL	38,888	6,457	99	12,524	57,968

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.^dQuantities include water diverted under the extension of the contract season during November - December 10.

TABLE 2

**Princeton-Codora-Glenn Irrigation District – 2015 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	390	0
May	810	325
June	608	325
July	1,156	325
August	294	0
September	0	0
October	201	0
TOTAL	3,459	975

^aEstimated by District based on observation and historical information.

TABLE 3

**Princeton-Codora-Glenn Irrigation District – 2015 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	2,607	390	2,997
May	12,349	810	13,159
June	12,266	608	12,874
July	14,096	1,156	15,252
August	11,299	294	11,593
September	1,087	0	1,087
October	4,264	201	4,465
TOTAL	57,968	3,459	61,427

^aIn addition to the water supplies shown in Table 3, 2,627 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Princeton-Codora-Glenn Irrigation District

Princeton-Codora-Glenn Irrigation District – 2015 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.01	1.3	0.11
Feb	2.1	0.18	2.3	0.19
Mar	0.2	0.02	4.6	0.38
Apr	1.1	0.09	6.6	0.55
May	0.0	0.00	7.5	0.62
Jun	0.0	0.00	8.6	0.72
Jul	0.0	0.00	8.8	0.73
Aug	0.0	0.00	7.8	0.65
Sept	0.0	0.00	5.7	0.48
Oct	0.1	0.01	4.3	0.36
Nov	1.7	0.14	2.2	0.19
Dec	1.3	0.11	1.3	0.11
TOTAL-YR	6.7	0.56	61.0	5.08
TOTAL-Apr-Oct	1.3	0.10	49.3	4.10

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Princeton-Codora-Glenn Irrigation District – 2015 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	68,640	30	47	5	194	11,818	(12,007)
Laterals	219,384	15	76	8	310	5,666	(5,968)
Water Shed Drains	113,520	15	39	4	160	1,955	(2,111)
TOTAL			162	17	665	19,439	(20,086)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Princeton-Codora-Glenn Irrigation District – 2015 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	61,427
Private Groundwater	Table 2	975
Inflow From Precip ^b	Estimated	778
Available Soil Moisture ^c	Estimated	92
	Total Water Supplies =	63,273
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	19,439
Evaporation - Precipitation (Canals/Laterals)	Table 4	648
Riparian ET ^d (Canals/Laterals)	Estimated	100
Conveyance System Filling ^e (Canals/Laterals)	Estimated	580
	Total Distribution System =	20,766
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	23,226
Evapotranspiration of Precip - ET _{pr}	Table 5	272
Cultural Practices (includes Leaching Requirement)	Table 5	590
	Total Crop Water Needs =	24,088
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	624
Rice Cultural and Ecosystem Requirement ^h	Estimated	5,991
Upslope Drainwater Flow Through	Estimated	6,262
Remainder Drainwater Outflow ⁱ	Calculated	720
	Total District Outflow (from District Records) =	13,598
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	2,627
Percolation from Agricultural Lands^j (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		4,821

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^jPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Princeton-Codora-Glenn Irrigation District

TABLE 7

**Princeton-Codora-Glenn Irrigation District – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^c (acre-feet)
2006	40,671	14,600	0	-	55,271	4,860	-
2007	50,875	14,800	0	-	65,675	5,276	-
2008	52,810	16,398	0	-	69,208	5,682	-
2009	50,800	13,847	0	-	64,647	6,078	-
2010	44,869	14,428	0	23,736	83,033	5,531	27,428
2011	38,257	12,485	0	26,189	76,931	7,664	26,460
2012	43,303	12,950	17,908	12,856	87,017	8,702	26,388
2013	47,890	10,231	11,453	16,828	86,402	7,383	26,388
2014	38,389	2,789	1,084	12,524	51,822	3,138	17,747
2015	38,888	6,457	99	12,524	57,968	2,627	13,598
Total	446,752	118,985	30,544	104,657	697,974	56,941	138,008
Average	44,675	11,899	3,054	17,443	69,797	5,694	23,001

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information. Data prior to 2010 are not available.^dEstimated by District based on observation and historical information.

Reclamation District 108

Reclamation District 108

TABLE 1

**Reclamation District 108 – 2013 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	11,713	0	0	127	11,840
May	46,314	0	0	611	46,925
June	45,027	0	0	561	45,588
July	31,500	16,957	0	180	48,637
August	16,500	8,647	0	340	25,487
September	3,410	0	0	58	3,468
October	7,204	0	0	0	7,204
TOTAL	161,668	25,604	0	1,877	189,149

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Reclamation District 108 – 2013 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
TOTAL	0	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Reclamation District 108 – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	11,840	0	11,840
May	46,925	0	46,925
June	45,588	0	45,588
July	48,637	0	48,637
August	25,487	0	25,487
September	3,468	0	3,468
October	7,204	0	7,204
TOTAL	189,149	0	189,149

^aIn addition to the water supplies shown in Table 3, 28,616 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Reclamation District 108

Reclamation District 108 – 2013 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2013	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.9	0.07	1.7	0.14
Feb	0.2	0.02	2.9	0.25
Mar	1.2	0.10	4.4	0.37
Apr	0.7	0.06	7.4	0.62
May	0.1	0.01	8.3	0.69
Jun	0.2	0.02	8.3	0.69
Jul	0.0	0.00	9.0	0.75
Aug	0.0	0.00	7.6	0.63
Sept	0.6	0.05	5.7	0.48
Oct	0.0	0.00	4.6	0.39
Nov	0.9	0.07	2.8	0.23
Dec	0.3	0.02	2.1	0.18
TOTAL-YR	5.1	0.42	64.8	5.40
TOTAL-Apr-Oct	1.6	0.13	50.9	4.24

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Reclamation District 108 – 2013 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	528,000	24	291	38	1,233	2,909	(4,104)
Laterals	158,400	24	87	11	370	873	(1,231)
Water Shed Drains	0	0	0	0	0	0	0
TOTAL			378	50	1,603	3,782	(5,335)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Reclamation District 108

TABLE 5

Reclamation District 108 – 2013 Crop Consumptive Use Water Needs (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Crop Name	Acres ^a (crop acres)	Crop ET ^b (AF/Ac)	Effective Precipitation ^c		ETAW (acre-feet)	Leaching Requirement	
			(AF/Ac)	(acre-feet)		(AF/Ac)	(acre-feet)
Alfalfa	1,911	3.23	0.01	25	6,149	0.11	210
Barley	66	0.86	0.01	1	56	0.02	1
Beans	350	0.86	0.01	3	297	0.47	165
Corn	1,646	1.97	0.01	13	3,223	0.14	230
Idle	459	0.17	0.01	6	74	0.00	0
Melons	122	1.12	0.00	1	137	0.04	5
Milo	10	1.97	0.01	0	20	0.02	0
Pasture	163	3.42	0.01	2	555	0.03	5
Rice	31,230	3.06	0.01	406	95,264	0.06	1,874
Rice Straw Decomp	6,104	0.50	0.01	79	2,973	0.00	0
Safflowers	765	1.94	0.01	6	1,476	0.06	46
Sunflowers	3,108	1.94	0.01	25	5,999	0.06	186
Tomatoes	3,469	1.69	0.01	28	5,836	0.08	278
Vinseed	1,328	0.99	0.01	17	1,297	0.18	239
Walnuts	1,307	3.25	0.01	17	4,227	0.16	209
Wheat	1,616	0.86	0.01	13	1,370	0.03	48
Crop Acres	53,654			643	128,952		3,496

Total Irrig. Acres

47,091

(If this number is larger than your known total, it may be due to double cropping.)

^aAcres include lands, if any, irrigated by private wells.^bCrop ET (ETc) was calculated as average ET_o for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235) × K_c based on ITRC Dry Year ET_c for Zone 12 surface irrigation for water balances. Crop ET does not include water required for initial flooding, reflooding, or flow through on rice acres. This quantity is estimated to be approximately 1.25 to 1.5 acre-feet per acre (approximately 39,000 to 47,000 acre-feet in 2013).^cEffective Precipitation is estimated as 60% of monthly precipitation greater than 0.5 inch during crop growing season. Because of the nature of flooded areas, such as rice field and flooded habitat, irrigation-season precipitation increases the volume of water in the flooded basin, but it typically flows through the field and, therefore, is assumed to be unavailable to meet the crop water needs.

Reclamation District 108

TABLE 6

**Reclamation District 108 – 2013 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	189,149
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	6,234
Available Soil Moisture ^c	Estimated	1,048
	Total Water Supplies =	196,431
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	3,782
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,553
Riparian ET ^d (Canals/Laterals)	Estimated	3,890
Conveyance System Filling ^e (Canals/Laterals)	Estimated	1,891
	Total Distribution System =	11,116
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	128,952
Evapotranspiration of Precip - ET _{pr}	Table 5	643
Cultural Practices (includes Leaching Requirement)	Table 5	3,496
	Total Crop Water Needs =	133,091
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	4,095
Rice Cultural and Ecosystem Requirement ^h	Estimated	31,230
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	43,170
	Total District Outflow (from District Records) =	78,495
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	28,616
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	(26,271)

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomposition acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Reclamation District 108

TABLE 7

**Reclamation District 108 – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^c (acre-feet)
2004	157,751	0	-	4,566	162,317	60,623	54,576
2005	123,889	14,231	-	2,263	140,383	50,086	51,970
2006	153,886	0	-	5,571	159,457	54,230	79,837
2007	139,071	3,779	-	3,773	146,623	51,488	31,472
2008	174,949	4,389	-	779	180,117	46,161	43,865
2009	153,995	0	-	2,433	156,428	50,212	35,458
2010	124,132	20,245	0	2,984	147,361	84,430	22,080
2011	143,793	14,913	0	1,415	160,121	51,819	50,434
2012	141,324	17,967	0	1,160	160,451	53,739	39,975
2013	161,668	25,604	0	1,877	189,149	28,616	78,495
Total	1,474,458	101,128	0	26,820	1,602,406	531,404	488,162
Average	147,446	10,113	0	2,682	160,241	53,140	48,816

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

Reclamation District 108

TABLE 1

**Reclamation District 108 – 2014 Surface Water Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	2,220	0	0	4	2,224
May	31,295	0	0	54	31,349
June	27,463	0	0	157	27,620
July	30,223	0	0	238	30,461
August	19,727	0	0	223	19,950
September	6,343	0	0	77	6,420
October	5,063	0	0	27	5,090
TOTAL	122,334	0	0	780	123,114

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Reclamation District 108 – 2014 Groundwater Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	2,057	0
May	2,034	0
June	2,154	0
July	742	0
August	1,109	0
September	114	0
October	126	0
TOTAL	8,336	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Reclamation District 108 – 2014 Total District Water Supply (excluding reuse)
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	2224	2057	4281
May	31349	2034	33383
June	27620	2154	29774
July	30461	742	31203
August	19950	1109	21059
September	6420	114	6534
October	5090	126	5216
TOTAL	123114	8336	131450

^aIn addition to the water supplies shown in Table 3, 51,216 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Reclamation District 108

Reclamation District 108 – 2014 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.02	2.4	0.20
Feb	3.7	0.31	2.0	0.17
Mar	1.6	0.14	4.1	0.34
Apr	1.2	0.10	5.9	0.49
May	0.1	0.01	8.4	0.70
Jun	0.0	0.00	9.1	0.76
Jul	0.0	0.00	8.9	0.74
Aug	0.1	0.01	7.3	0.61
Sept	0.4	0.03	5.8	0.48
Oct	0.3	0.03	4.1	0.34
Nov	1.2	0.10	1.8	0.15
Dec	7.3	0.60	1.1	0.09
TOTAL-YR	16	1.33	60.9	5.07
TOTAL-Apr-Oct	2.1	0.17	49.5	4.13

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Reclamation District 108 – 2014 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	528,000	24	291	50	1,200	2,909	(4,059)
Laterals	158,400	24	87	15	360	873	(1,218)
Water Shed Drains	0	0	0	0	0	0	0
TOTAL			378	65	1,560	3,782	(5,277)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 5

Reclamation District 108 – 2014 Crop Consumptive Use Water Needs (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Crop Name	Acres ^a (crop acres)	Crop ET ^b (AF/Ac)	Effective Precipitation ^c		ETAW (acre-feet)	Leaching Requirement	
			(AF/Ac)	(acre-feet)		(AF/Ac)	(acre-feet)
Alfalfa	1,900	3.14	0.03	62	5,900	0.11	209
Barley	46	0.75	0.03	1	33	0.02	1
Beans	121	0.75	0.03	4	86	0.47	57
Corn	354	1.96	0.03	12	683	0.14	50
Idle	6,715	0.15	0.03	218	793	0.00	0
Melons	602	1.12	0.00	0	673	0.04	24
Onions	25	0.87	0.03	1	21	0.28	7
Pasture	163	3.33	0.03	5	538	0.03	5
Rice	25,481	3.08	0.03	828	77,602	0.06	1,529
Rice Straw Decomp	3,145	0.50	0.03	102	1,470	0.00	0
Safflowers	1,087	1.90	0.03	35	2,031	0.06	65
Sunflowers	2,286	1.90	0.03	74	4,271	0.06	137
Tomatoes	3,641	1.71	0.03	118	6,113	0.08	291
Vinseed	1,131	0.87	0.03	37	951	0.18	204
Walnuts	1,720	3.21	0.03	56	5,470	0.16	275
Wheat	2,287	0.75	0.03	74	1,634	0.03	69
Crop Acres	50,704			1,628	108,269		2,923
Total Irrig. Acres	40,844	(If this number is larger than your known total, it may be due to double cropping.)					

^aAcres include lands, if any, irrigated by private wells.

^bCrop ET (ETc) was calculated as average ETo for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235) x Kc based on ITRC Dry Year ETc for Zone 12 surface irrigation for water balances. Crop ET does not include water required for initial flooding, reflooding, or flow through on rice acres. This quantity is estimated to be approximately 1.25 to 1.5 acre-feet per acre (approximately 31,850 to 38,250 acre-feet in 2014).

^cEffective Precipitation is estimated as 60% of monthly precipitation greater than 0.5 inch during crop growing season. Because of the nature of flooded areas, such as rice field and flooded habitat, irrigation-season precipitation increases the volume of water in the flooded basin, but it typically flows through the field and, therefore, is assumed to be unavailable to meet the crop water needs.

TABLE 6

**Reclamation District 108 – 2014 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	131,450
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	8,164
Available Soil Moisture ^c	Estimated	3,578
Total Water Supplies =		143,193
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	3,782
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,495
Riparian ET ^d (Canals/Laterals)	Estimated	3,370
Conveyance System Filling ^e (Canals/Laterals)	Estimated	1,231
Total Distribution System =		9,878
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	108,269
Evapotranspiration of Precip - ET _{pr}	Table 5	1,628
Cultural Practices (includes Leaching Requirement)	Table 5	2,923
Total Crop Water Needs =		112,820
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	4,374
Rice Cultural and Ecosystem Requirement ^h	Estimated	25,481
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	11,362
Total District Outflow (from District Records) =		41,217
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	51,216
Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		(20,723)

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Reclamation District 108

TABLE 7

**Reclamation District 108 – 2014 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^c (acre-feet)
2005	123,889	14,231	-	2,263	140,383	50,086	51,970
2006	153,886	0	-	5,571	159,457	54,230	79,837
2007	139,071	3,779	-	3,773	146,623	51,488	31,472
2008	174,949	4,389	-	779	180,117	46,161	43,865
2009	153,995	0	-	2,433	156,428	50,212	35,458
2010	124,132	20,245	0	2,984	147,361	84,430	22,080
2011	143,793	14,913	0	1,415	160,121	51,819	50,434
2012	141,324	17,967	0	1,160	160,451	53,739	39,975
2013	161,668	25,604	0	1,877	189,149	28,616	78,495
2014	122,334	0	0	780	123,114	51,216	41,217
Total	1,316,707	101,128	0	22,254	1,440,089	470,781	433,586
Average	146,301	11,236	0	2,473	160,010	52,309	48,176

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

Reclamation District 108

TABLE 1

**Reclamation District 108 – 2015 Surface Water Supply
(April through December Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	7,992	0	0	111	8,103
May	28,994	0	0	217	29,211
June	26,692	0	0	133	26,825
July	26,796	0	0	190	26,986
August	15,256	1,210	681	145	17,292
September	4,635	0	715	25	5,375
October ^d	4,733	0	0	0	4,733
TOTAL	115,098	1,210	1,396	821	118,525

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.^dQuantities include water diverted under the extension of the contract season during November - December 10.

TABLE 2

**Reclamation District 108 – 2015 Groundwater Supply
(April through December Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	480	0
May	2,471	0
June	1,962	420
July	1,760	1,200
August	1,691	230
September	642	0
October	0	0
TOTAL	9,006	1,850

^aEstimated by District based on observation and historical information.

TABLE 3

**Reclamation District 108 – 2015 Total District Water Supply (excluding reuse)
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	8,103	480	8,583
May	29,211	2,471	31,682
June	26,825	1,962	28,787
July	26,986	1,760	28,746
August	17,292	1,691	18,983
September	5,375	642	6,017
October	4,733	0	4,733
TOTAL	118,525	9,006	127,531

^aIn addition to the water supplies shown in Table 3, 45,510 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Reclamation District 108

Reclamation District 108 – 2015 Distribution System Evaporation and Seepage Worksheet 2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.01	1.3	0.11
Feb	2.1	0.18	2.3	0.19
Mar	0.2	0.02	4.6	0.38
Apr	1.1	0.09	6.6	0.55
May	0.0	0.00	7.5	0.62
Jun	0.0	0.00	8.6	0.72
Jul	0.0	0.00	8.8	0.73
Aug	0.0	0.00	7.8	0.65
Sept	0.0	0.00	5.7	0.48
Oct	0.1	0.01	4.3	0.36
Nov	1.7	0.14	2.2	0.19
Dec	1.3	0.11	1.3	0.11
TOTAL-YR	6.7	0.56	61.0	5.08
TOTAL-Apr-Oct	1.3	0.10	49.3	4.10

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Reclamation District 108 – 2015 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	528,000	24	291	30	1,194	2,909	(4,073)
Laterals	158,400	24	87	9	358	873	(1,222)
Water Shed Drains	0	0	0	0	0	0	0
TOTAL			378	39	1,552	3,782	(5,295)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Reclamation District 108

TABLE 5

Reclamation District 108 – 2015 Crop Consumptive Use Water Needs (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Crop Name	Acres ^a (crop acres)	Crop ET ^b (AF/Ac)	Effective Precipitation ^c		ETAW (acre-feet)	Leaching Requirement	
			(AF/Ac)	(acre-feet)		(AF/Ac)	(acre-feet)
Alfalfa	1,775	3.13	0.03	53	5,497	0.11	195
Beans	174	0.77	0.03	5	128	0.47	82
Corn	369	1.94	0.03	11	705	0.14	52
Idle	9,390	0.16	0.03	282	1,222	0.00	0
Melons	266	1.12	0.00	0	299	0.04	11
Milo	36	1.94	0.03	1	69	0.02	1
Oats	211	0.77	0.03	6	156	0.02	4
Walnuts	2,373	3.18	0.03	71	7,476	0.16	380
Pasture	163	3.31	0.03	5	535	0.03	5
Rice	22,299	3.01	0.03	669	66,560	0.06	1,338
Rice Straw Decomp	2,674	0.50	0.03	80	1,257	0.00	0
Safflowers	978	1.84	0.03	29	1,769	0.06	59
Sunflowers	1,781	1.84	0.03	53	3,221	0.06	107
Tomatoes	4,293	1.65	0.03	129	6,969	0.08	343
Vinseed	1,047	0.91	0.03	31	925	0.18	188
Wheat	2,190	0.77	0.03	66	1,614	0.03	66
Crop Acres	50,019			1,493	98,402		2,831

Total Irrig. Acres

37,955

(If this number is larger than your known total, it may be due to double cropping.)

^aAcres include lands, if any, irrigated by private wells.^bCrop ET (ETc) was calculated as average ETo for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235) x Kc based on ITRC Dry Year ETc for Zone 12 surface irrigation for water balances. Crop ET does not include water required for initial flooding, reflooding, or flow through on rice acres. This quantity is estimated to be approximately 1.25 to 1.5 acre-feet per acre (approximately 27,875 to 33,450 acre-feet in 2015).^cEffective Precipitation is estimated as 60% of monthly precipitation greater than 0.5 inch during crop growing season. Because of the nature of flooded areas, such as rice field and flooded habitat, irrigation-season precipitation increases the volume of water in the flooded basin, but it typically flows through the field and, therefore, is assumed to be unavailable to meet the crop water needs.

TABLE 6

**Reclamation District 108 – 2015 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	127,531
Private Groundwater	Table 2	1,850
Inflow From Precip ^b	Estimated	4,932
Available Soil Moisture ^c	Estimated	1,559
	Total Water Supplies =	135,872
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	3,782
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,513
Riparian ET ^d (Canals/Laterals)	Estimated	3,130
Conveyance System Filling ^e (Canals/Laterals)	Estimated	1,185
	Total Distribution System =	9,610
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	98,402
Evapotranspiration of Precip - ET _{pr}	Table 5	1,493
Cultural Practices (includes Leaching Requirement)	Table 5	2,831
	Total Crop Water Needs =	102,726
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	2,323
Rice Cultural and Ecosystem Requirement ^h	Estimated	22,299
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	8,499
	Total District Outflow (from District Records) =	33,121
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	45,510
Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		(9,585)

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Reclamation District 108

TABLE 7

**Reclamation District 108 – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^c (acre-feet)
2006	153,886	0	-	5,571	159,457	54,230	79,837
2007	139,071	3,779	-	3,773	146,623	51,488	31,472
2008	174,949	4,389	-	779	180,117	46,161	43,865
2009	153,995	0	-	2,433	156,428	50,212	35,458
2010	124,132	20,245	0	2,984	147,361	84,430	22,080
2011	143,793	14,913	0	1,415	160,121	51,819	50,434
2012	141,324	17,967	0	1,160	160,451	53,739	39,975
2013	161,668	25,604	0	1,877	189,149	28,616	78,495
2014	122,334	0	0	780	123,114	51,216	41,217
2015	115,098	1,210	1,396	821	118,525	45,510	33,121
Total	1,430,250	88,107	1,396	21,593	1,541,346	517,421	455,954
Average	143,025	8,811	233	2,159	154,135	51,742	45,595

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

Reclamation District 1004

Reclamation District 1004

TABLE 1

**Reclamation District 1004 – 2013 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	5,647	-	1,417	0	7,064
May	10,234	-	3,628	0	13,862
June	9,667	-	5,658	0	15,325
July	6,100	5,495	6,459	0	18,054
August	3,600	4,888	4,533	0	13,021
September	1,025	232	1,800	0	3,057
October	5,300	187	2,182	0	7,669
TOTAL	41,573	10,802	25,677	0	78,052

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Reclamation District 1004 – 2013 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	599	0
May	194	0
June	338	0
July	314	2,946
August	4	2,973
September	0	2,157
October	262	0
TOTAL	1,711	8,077

^aEstimated by District based on observation and historical information.

TABLE 3

**Reclamation District 1004 – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	7,064	599	7,663
May	13,862	194	14,056
June	15,325	338	15,663
July	18,054	314	18,368
August	13,021	4	13,025
September	3,057	0	3,057
October	7,669	262	7,931
TOTAL	78,052	1,711	79,763

^aIn addition to the water supplies shown in Table 3, 16,095 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Reclamation District 1004**Reclamation District 1004 – Distribution System Evaporation and Seepage Worksheet**
2015 Sacramento Valley Regional Water Management Plan Annual Update

2013	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.9	0.07	1.7	0.14
Feb	0.2	0.02	2.9	0.25
Mar	1.2	0.10	4.4	0.37
Apr	0.7	0.06	7.4	0.62
May	0.1	0.01	8.3	0.69
Jun	0.2	0.02	8.3	0.69
Jul	0.0	0.00	9.0	0.75
Aug	0.0	0.00	7.6	0.63
Sep	0.6	0.05	5.7	0.48
Oct	0.0	0.00	4.6	0.39
Nov	0.9	0.07	2.8	0.23
Dec	0.3	0.02	2.1	0.18
TOTAL-YR	5.1	0.42	64.8	5.40
TOTAL-Apr-Oct	1.6	0.13	50.9	4.24

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Reclamation District 1004 – 2013 Distribution System Evaporation and Seepage
(April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canals	25,872	135	80	10	339	2,000	(2,329)
Canals	28,512	51	34	4	142	838	(975)
Canals	23,232	41	22	3	92	540	(629)
Laterals	42,768	32	31	4	131	773	(900)
Laterals	63,096	22	32	4	135	797	(928)
Laterals	47,256	15	16	2	69	410	(477)
Drains	29,568	44	30	4	126	742	(863)
Drains	29,568	28	19	3	81	480	(559)
Drains	85,536	15	29	4	125	736	(857)
Drains	12,144	12	3	0	14	84	(97)
TOTAL			296	39	1,254	7,399	(8,615)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Reclamation District 1004

TABLE 6

**Reclamation District 1004 – 2013 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	79,763
Private Groundwater	Table 2	8,077
Inflow From Precip ^b	Estimated	2,266
Available Soil Moisture ^c	Estimated	24
	Total Water Supplies =	90,130
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	7,399
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,216
Riparian ET ^d (Canals/Laterals)	Estimated	550
Conveyance System Filling ^e (Canals/Laterals)	Estimated	781
	Total Distribution System =	9,946
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	50,083
Evapotranspiration of Precip - ET _{pr}	Table 5	223
Cultural Practices (includes Leaching Requirement)	Table 5	961
	Total Crop Water Needs =	51,267
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	12,371
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	0
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	16,095
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	28,917

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Reclamation District 1004

TABLE 7

**Reclamation District 1004 – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^e (acre-feet)
2004	56,400	8,727	20,000	0	85,127	12,800	0
2005	39,939	12,953	20,000	0	72,892	10,900	0
2006	33,584	13,497	20,000	0	67,081	10,100	0
2007	46,168	9,973	20,000	0	76,141	11,400	0
2008	47,605	9,761	20,158	0	77,524	11,600	0
2009	38,151	12,170	20,255	0	70,576	10,600	0
2010	48,218	11,250	23,473	0	82,941	12,500	0
2011	35,874	10,639	23,395	0	69,908	7,436	0
2012	43,022	10,048	23,395	0	76,465	16,095	0
2013	41,573	10,802	25,677	0	78,052	16,095	0
Total	430,534	109,820	216,353	0	756,707	119,526	0
Average	43,053	10,982	21,635	0	75,671	11,953	0

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information.^dEstimated by District based on observation and historical information.^eDistrict operates a closed system with little or no outflow; drainwater from rice fields is recaptured and delivered for rice straw decomposition and habitat lands.

Reclamation District 1004

TABLE 1

**Reclamation District 1004 – 2014 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	669	0	1,829	0	2,498
May	6,758	0	4,694	0	11,452
June	7,177	0	4,709	0	11,886
July	8,924	0	6,175	0	15,099
August	4,203	0	5,652	0	9,855
September	1,210	0	2,601	0	3,811
October	11,125	0	1,205	0	12,330
TOTAL	40,066	0	26,865	0	66,931

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Reclamation District 1004 – 2014 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	22	0
May	1,248	600
June	1,584	822
July	1,467	2,022
August	854	1,625
September	1,248	695
October	1,632	33
TOTAL	8,055	5,797

^aEstimated by District based on observation and historical information.

TABLE 3

**Reclamation District 1004 – 2014 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	2,498	22	2,520
May	11,452	1,248	12,700
June	11,886	1,584	13,470
July	15,099	1,467	16,566
August	9,855	854	10,709
September	3,811	1,248	5,059
October	12,330	1,632	13,962
TOTAL	66,931	8,055	74,986

^aIn addition to the water supplies shown in Table 3, 12,070 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Reclamation District 1004**Reclamation District 1004 – 2014 Distribution System Evaporation and Seepage Worksheet**

2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.02	2.4	0.20
Feb	3.7	0.31	2.0	0.17
Mar	1.6	0.14	4.1	0.34
Apr	1.2	0.10	5.9	0.49
May	0.1	0.01	8.4	0.70
Jun	0.0	0.00	9.1	0.76
Jul	0.0	0.00	8.9	0.74
Aug	0.1	0.01	7.3	0.61
Sept	0.4	0.03	5.8	0.48
Oct	0.3	0.03	4.1	0.34
Nov	1.2	0.10	1.8	0.15
Dec	7.3	0.60	1.1	0.09
TOTAL-YR	16	1.33	60.9	5.07
TOTAL-Apr-Oct	2.1	0.17	49.5	4.13

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

**Reclamation District 1004 – 2014 Distribution System Evaporation and Seepage
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canals	25,872	135	80	14	330	2,000	(2,316)
Canals	28,512	51	34	6	138	838	(970)
Canals	23,232	41	22	4	89	540	(625)
Laterals	42,768	32	31	5	128	773	(895)
Laterals	63,096	22	32	5	131	797	(923)
Laterals	47,256	15	16	3	68	410	(474)
Drains	29,568	44	30	5	122	742	(859)
Drains	29,568	28	19	3	79	480	(556)
Drains	85,536	15	29	5	122	736	(853)
Drains	12,144	12	3	1	14	84	(97)
TOTAL			296	51	1,221	7,399	(8,569)

^aFrom District statistics.^bAverage width of the conveyance facilities.^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.^dEstimated evaporation from canals, laterals, and drains during the irrigation season.^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Reclamation District 1004 – 2014 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	74,986
Private Groundwater	Table 2	5,797
Inflow From Precip ^b	Estimated	2,959
Available Soil Moisture ^c	Estimated	11
	Total Water Supplies =	83,753
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	7,399
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,170
Riparian ET ^d (Canals/Laterals)	Estimated	550
Conveyance System Filling ^e (Canals/Laterals)	Estimated	669
	Total Distribution System =	9,788
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	49,152
Evapotranspiration of Precip - ET _{pr}	Table 5	560
Cultural Practices (includes Leaching Requirement)	Table 5	894
	Total Crop Water Needs =	50,607
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	11,578
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	0
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	12,070
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	23,358

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomposition acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

TABLE 7

**Reclamation District 1004 – 2014 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^e (acre-feet)
2005	39,939	12,953	20,000	0	72,892	10,900	0
2006	33,584	13,497	20,000	0	67,081	10,100	0
2007	46,168	9,973	20,000	0	76,141	11,400	0
2008	47,605	9,761	20,158	0	77,524	11,600	0
2009	38,151	12,170	20,255	0	70,576	10,600	0
2010	48,218	11,250	23,473	0	82,941	12,500	0
2011	35,874	10,639	23,395	0	69,908	7,436	0
2012	43,022	10,048	23,395	0	76,465	16,095	0
2013	41,573	10,802	25,677	0	78,052	16,095	0
2014	40,066	0	26,865	0	66,931	12,070	0
Total	374,134	101,093	196,353	0	671,580	106,726	0
Average	41,570	11,233	21,817	0	74,620	11,858	0

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information.^dEstimated by District based on observation and historical information.^eDistrict operates a closed system with little or no outflow; drainwater from rice fields is recaptured and delivered for rice straw decomposition and habitat lands.

Reclamation District 1004

TABLE 1

**Reclamation District 1004 – 2015 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	2,460	0	1,234	0	3,694
May	6,411	0	1,021	0	7,432
June	8,993	0	1,886	0	10,879
July	6,235	2,433	2,023	0	10,691
August	585	2,611	1,526	0	4,722
September	1,617	0	591	0	2,208
October	3,975	0	663	0	4,638
TOTAL	30,276	5,044	8,944	0	44,264

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Reclamation District 1004 – 2015 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	601	0
May	1,574	474
June	1,878	711
July	1,788	992
August	1,465	738
September	534	533
October	494	0
TOTAL	8,334	3,448

^aEstimated by District based on observation and historical information.

TABLE 3

**Reclamation District 1004 – 2015 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	3,694	601	4,295
May	7,432	1,574	9,006
June	10,879	1,878	12,757
July	10,691	1,788	12,479
August	4,722	1,465	6,187
September	2,208	534	2,742
October	4,638	494	5,132
TOTAL	44,264	8,334	52,598

^aIn addition to the water supplies shown in Table 3, 8,050 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Reclamation District 1004**Reclamation District 1004 – 2015 Distribution System Evaporation and Seepage Worksheet**

2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.01	1.3	0.11
Feb	2.1	0.18	2.3	0.19
Mar	0.2	0.02	4.6	0.38
Apr	1.1	0.09	6.6	0.55
May	0.0	0.00	7.5	0.62
Jun	0.0	0.00	8.6	0.72
Jul	0.0	0.00	8.8	0.73
Aug	0.0	0.00	7.8	0.65
Sept	0.0	0.00	5.7	0.48
Oct	0.1	0.01	4.3	0.36
Nov	1.7	0.14	2.2	0.19
Dec	1.3	0.11	1.3	0.11
TOTAL-YR	6.7	0.56	61.0	5.08
TOTAL-Apr-Oct	1.3	0.10	49.3	4.10

^a Average precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).^b Monthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

**Reclamation District 1004 – 2015 Distribution System Evaporation and Seepage
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canals	25,872	135	80	8	328	2,000	(2,320)
Canals	28,512	51	34	3	138	838	(972)
Canals	23,232	41	22	2	89	540	(626)
Laterals	42,768	32	31	3	127	773	(897)
Laterals	63,096	22	32	3	131	797	(924)
Laterals	47,256	15	16	2	67	410	(475)
Drains	29,568	44	30	3	122	742	(860)
Drains	29,568	28	19	2	79	480	(557)
Drains	85,536	15	29	3	121	736	(854)
Drains	12,144	12	3	0	14	84	(97)
TOTAL			296	31	1,215	7,399	(8,583)

^a From District statistics.^b Average width of the conveyance facilities.^c Estimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.^d Estimated evaporation from canals, laterals, and drains during the irrigation season.^e Estimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Reclamation District 1004 – 2015 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	52,598
Private Groundwater	Table 2	3,448
Inflow From Precip ^b	Estimated	1,802
Available Soil Moisture ^c	Estimated	74
	Total Water Supplies =	57,921
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	7,399
Evaporation - Precipitation (Canals/Laterals)	Table 4	1,184
Riparian ET ^d (Canals/Laterals)	Estimated	550
Conveyance System Filling ^e (Canals/Laterals)	Estimated	443
	Total Distribution System =	9,576
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	47,021
Evapotranspiration of Precip - ET _{pr}	Table 5	519
Cultural Practices (includes Leaching Requirement)	Table 5	1,010
	Total Crop Water Needs =	48,550
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	10,441
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	0
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	8,050
Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		(205)

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

TABLE 7

**Reclamation District 1004 – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture ^d (acre-feet)	Outflow ^e (acre-feet)
2006	33,584	13,497	20,000	0	67,081	10,100	0
2007	46,168	9,973	20,000	0	76,141	11,400	0
2008	47,605	9,761	20,158	0	77,524	11,600	0
2009	38,151	12,170	20,255	0	70,576	10,600	0
2010	48,218	11,250	23,473	0	82,941	12,500	0
2011	35,874	10,639	23,395	0	69,908	7,436	0
2012	43,022	10,048	23,395	0	76,465	16,095	0
2013	41,573	10,802	25,677	0	78,052	16,095	0
2014	40,066	0	26,865	0	66,931	12,070	0
2015	30,276	5,044	8,944	0	44,264	8,050	0
Total	404,537	93,184	212,162	0	709,883	115,946	0
Average	40,454	9,318	21,216	0	70,988	11,595	0

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records; quantities prior to 2008 are estimated.^cEstimated by District based on observation and historical information.^dEstimated by District based on observation and historical information.^eDistrict operates a closed system with little or no outflow; drainwater from rice fields is recaptured and delivered for rice straw decomposition and habitat lands.

Meridian Farms Water Company

Meridian Farms Water Company

TABLE 1

**Meridian Farms Water Company – 2013 Surface Water Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	2,339	0	0	0	2,339
May	5,187	0	0	200	5,387
June	6,981	0	0	300	7,281
July	2,655	5,000	0	200	7,855
August	2,000	4,281	0	100	6,381
September	1,461	0	0	0	1,461
October	276	0	0	0	276
TOTAL	20,899	9,281	0	800	30,980

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Meridian Farms Water Company – 2013 Groundwater Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	785	0
June	1,980	0
July	1,900	0
August	400	0
September	0	0
October	0	0
TOTAL	5,065	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Meridian Farms Water Company – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	2,339	0	2,339
May	5,387	785	6,172
June	7,281	1,980	9,261
July	7,855	1,900	9,755
August	6,381	400	6,781
September	1,461	0	1,461
October	276	0	276
Total	30,980	5,065	36,045

^aIn addition to the water supplies shown in Table 3, 20,618 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Meridian Farms Water Company

TABLE 6

**Meridian Farms Water Company – 2013 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	36,045
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,240
Available Soil Moisture ^c	Estimated	298
	Total Water Supplies =	37,583
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	1,527
Evaporation - Precipitation (Canals/Laterals)	Table 4	209
Riparian ET ^d (Canals/Laterals)	Estimated	1,706
Conveyance System Filling ^e (Canals/Laterals)	Estimated	310
	Total Distribution System =	3,752
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	23,564
Evapotranspiration of Precip - ET _{pr}	Table 5	107
Cultural Practices (includes Leaching Requirement)	Table 5	890
	Total Crop Water Needs =	24,562
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	4,842
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	3,871
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	20,618
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	5,398

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Meridian Farms Water Company

TABLE 7

**Meridian Farms Water Company – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2004	22,568	7,970	-	7,968	38,506	7,968	11,359
2005	15,272	9,903	-	5,767	30,942	5,767	8,272
2006	12,398	9,224	-	12,565	34,187	12,565	11,138
2007	17,506	5,130	-	11,927	34,563	11,927	3,396
2008	19,122	8,579	-	6,925	34,626	6,925	3,631
2009	17,090	8,611	-	7,420	33,121	7,420	3,165
2010	17,530	9,512	0	8,695	35,737	8,695	5,499
2011	16,792	10,565	0	10,915	38,272	10,915	6,750
2012	19,349	11,208	0	11,625	42,182	11,625	5,825
2013	20,899	9,281	0	800	30,980	20,618	3,871
Total	178,526	89,983	0	84,607	353,116	104,425	62,906
Average	17,853	8,998	0	8,461	35,312	10,442	6,291

^aFederal Ag Water Supply from Reclamation Water Account Records. Data prior to 2010 are not available.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013.^dEstimated by District based on observation and historical information.

Meridian Farms Water Company

TABLE 1

**Meridian Farms Water Company – 2014 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	672	0	0	0	672
May	4,348	0	0	200	4,548
June	5,208	0	0	300	5,508
July	4,430	867	0	200	5,497
August	825	3,176	0	150	4,151
September	1,147	0	0	50	1,197
October	0	0	0	0	0
TOTAL	16,630	4,043	0	900	21,573

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Meridian Farms Water Company – 2014 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	785	0
June	1,980	0
July	1,900	0
August	400	0
September	0	0
October	0	0
TOTAL	5,065	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Meridian Farms Water Company – 2014 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	672	0	672
May	4548	785	5333
June	5508	1980	7488
July	5497	1900	7397
August	4151	400	4551
September	1197	0	1197
October	0	0	0
TOTAL	21573	5065	26638

^aIn addition to the water supplies shown in Table 3, 10,663 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Meridian Farms Water Company

Meridian Farms Water Company – 2014 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.02	2.4	0.20
Feb	3.7	0.31	2.0	0.17
Mar	1.6	0.14	4.1	0.34
Apr	1.2	0.10	5.9	0.49
May	0.1	0.01	8.4	0.70
Jun	0.0	0.00	9.1	0.76
Jul	0.0	0.00	8.9	0.74
Aug	0.1	0.01	7.3	0.61
Sept	0.4	0.03	5.8	0.48
Oct	0.3	0.03	4.1	0.34
Nov	1.2	0.10	1.8	0.15
Dec	7.3	0.60	1.1	0.09
TOTAL-YR	16	1.33	60.9	5.07
TOTAL-Apr-Oct	2.1	0.17	49.5	4.13

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Meridian Farms Water Company – 2014 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	84,480	12	23	4	96	698	(790)
Pipeline	0	0	0	0	0	0	0
Laterals	100,320	12	28	5	114	829	(938)
Water Shed Drains	0	0	0	0	0	0	0
Reservoir	0	0	0	0	0	0	0
TOTAL			51	9	210	1,527	(1,729)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Meridian Farms Water Company – 2014 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	26,638
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	1,308
Available Soil Moisture ^c	Estimated	951
Total Water Supplies =		28,897
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	1,527
Evaporation - Precipitation (Canals/Laterals)	Table 4	201
Riparian ET ^d (Canals/Laterals)	Estimated	1,706
Conveyance System Filling ^e (Canals/Laterals)	Estimated	216
Total Distribution System =		3,651
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	18,080
Evapotranspiration of Precip - ET _{pr}	Table 5	184
Cultural Practices (includes Leaching Requirement)	Table 5	718
Total Crop Water Needs =		18,982
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	3,161
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
Total District Outflow (from District Records) =		2,574
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	10,663
Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		3,690

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Meridian Farms Water Company

TABLE 7

**Meridian Farms Water Company – 2014 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2005	15,272	9,903	-	5,767	30,942	5,767	8,272
2006	12,398	9,224	-	12,565	34,187	12,565	11,138
2007	17,506	5,130	-	11,927	34,563	11,927	3,396
2008	19,122	8,579	-	6,925	34,626	6,925	3,631
2009	17,090	8,611	-	7,420	33,121	7,420	3,165
2010	17,530	9,512	0	8,695	35,737	8,695	5,499
2011	16,792	10,565	0	10,915	38,272	10,915	6,750
2012	19,349	11,208	0	11,625	42,182	11,625	5,825
2013	20,899	9,281	0	800	30,980	20,618	3,871
2014	16,630	4,043	0	900	21,573	10,663	2,574
Total	155,958	82,013	0	76,639	314,610	96,457	51,547
Average	17,329	9,113	0	8,515	34,957	10,717	5,727

^aFederal Ag Water Supply from Reclamation Water Account Records. Data prior to 2010 are not available.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013^dEstimated by District based on observation and historical information.

Meridian Farms Water Company

TABLE 1

**Meridian Farms Water Company – 2015 Surface Water Supply
(April through December Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	934	0	0	0	934
May	3,898	0	0	100	3,998
June	4,017	0	0	200	4,217
July	4,458	0	0	250	4,708
August	1,393	2,229	0	100	3,722
September	1,229	0	0	100	1,329
October	424	0	0	0	424
TOTAL	16,353	2,229	0	750	19,332

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Meridian Farms Water Company – 2015 Groundwater Supply
(April through December Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	500	0
May	1,800	0
June	1,980	400
July	1,860	1,330
August	900	670
September	0	0
October	0	0
November	0	0
December	0	0
TOTAL	7,040	2,400

^aEstimated by District based on observation and historical information.

TABLE 3

**Meridian Farms Water Company – 2015 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	934	500	1434
May	3998	1800	5798
June	4217	1980	6197
July	4708	1860	6568
August	3722	900	4622
September	1329	0	1329
October	424	0	424
TOTAL	19332	7040	26372

^aIn addition to the water supplies shown in Table 3, 11,000 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

District/Company

Meridian Farms Water Company

Meridian Farms Water Company – 2015 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.01	1.3	0.11
Feb	2.1	0.18	2.3	0.19
Mar	0.2	0.02	4.6	0.38
Apr	1.1	0.09	6.6	0.55
May	0.0	0.00	7.5	0.62
Jun	0.0	0.00	8.6	0.72
Jul	0.0	0.00	8.8	0.73
Aug	0.0	0.00	7.8	0.65
Sep	0.0	0.00	5.7	0.48
Oct	0.1	0.01	4.3	0.36
Nov	1.7	0.14	2.2	0.19
Dec	1.3	0.11	1.3	0.11
TOTAL-YR	6.7	0.56	61.0	5.08
TOTAL-Apr-Oct	1.3	0.10	49.3	4.10

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Meridian Farms Water Company – 2015 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Canal	84,480	12	23	2	96	698	(791)
Pipeline	0	0	0	0	0	0	0
Laterals	100,320	12	28	3	113	829	(940)
Water Shed Drains	0	0	0	0	0	0	0
Reservoir	0	0	0	0	0	0	0
TOTAL			51	5	209	1,527	(1,731)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Meridian Farms Water Company – 2015 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	26,372
Private Groundwater	Table 2	2,400
Inflow From Precip ^b	Estimated	744
Available Soil Moisture ^c	Estimated	369
	Total Water Supplies =	29,886
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	1,527
Evaporation - Precipitation (Canals/Laterals)	Table 4	204
Riparian ET ^d (Canals/Laterals)	Estimated	1,706
Conveyance System Filling ^e (Canals/Laterals)	Estimated	193
	Total Distribution System =	3,630
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	17,243
Evapotranspiration of Precip - ET _{pr}	Table 5	273
Cultural Practices (includes Leaching Requirement)	Table 5	703
	Total Crop Water Needs =	18,219
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	333
Rice Cultural and Ecosystem Requirement ^h	Estimated	3,197
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	2,426
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	11,000
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	5,611

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate uncounted for groundwater pumping from privately owned wells.

Meridian Farms Water Company

TABLE 7

**Meridian Farms Water Company – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2006	12,398	9,224	-	12,565	34,187	12,565	11,138
2007	17,506	5,130	-	11,927	34,563	11,927	3,396
2008	19,122	8,579	-	6,925	34,626	6,925	3,631
2009	17,090	8,611	-	7,420	33,121	7,420	3,165
2010	17,530	9,512	0	8,695	35,737	8,695	5,499
2011	16,792	10,565	0	10,915	38,272	10,915	6,750
2012	19,349	11,208	0	11,625	42,182	11,625	5,825
2013	20,899	9,281	0	800	30,980	20,618	3,871
2014	16,630	4,043	0	900	21,573	10,663	2,574
2015	16,353	2,229	0	750	19,332	11,000	2,426
Total	173,669	78,382	0	72,522	324,573	112,353	48,275
Average	17,367	7,838	0	7,252	32,457	11,235	4,827

^aFederal Ag Water Supply from Reclamation Water Account Records. Data prior to 2010 are not available.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information. The methods for estimating and accounting for quantities were refined in 2013^dEstimated by District based on observation and historical information.

Sutter Mutual Water Company

Sutter Mutual Water Company

TABLE 1

**Sutter Mutual Water Company – 2013 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	16,591	0	0	0	16,591
May	42,500	0	0	0	42,500
June	48,000	755	0	0	48,755
July	28,500	24,744	0	0	53,244
August	20,000	13,874	0	0	33,874
September	2,589	0	0	0	2,589
October	5,500	2,302	0	0	7,802
TOTAL	163,680	41,675	0	0	205,355

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Sutter Mutual Water Company – 2013 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
TOTAL	0	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Sutter Mutual Water Company – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	16,591	0	16,591
May	42,500	0	42,500
June	48,755	0	48,755
July	53,244	0	53,244
August	33,874	0	33,874
September	2,589	0	2,589
October	7,802	0	7,802
TOTAL	205,355	0	205,355

^aIn addition to the water supplies shown in Table 3, 33,062 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Sutter Mutual Water Company**Sutter Mutual Water Company – 2013 Distribution System Evaporation and Seepage Worksheet**

2015 Sacramento Valley Regional Water Management Plan Annual Update

2013	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.9	0.07	1.7	0.14
Feb	0.2	0.02	2.9	0.25
Mar	1.2	0.10	4.4	0.37
Apr	0.7	0.06	7.4	0.62
May	0.1	0.01	8.3	0.69
Jun	0.2	0.02	8.3	0.69
Jul	0.0	0.00	9.0	0.75
Aug	0.0	0.00	7.6	0.63
Sept	0.6	0.05	5.7	0.48
Oct	0.0	0.00	4.6	0.39
Nov	0.9	0.07	2.8	0.23
Dec	0.3	0.02	2.1	0.18
TOTAL-YR	5.1	0.42	64.8	5.40
TOTAL-Apr-Oct	1.6	0.13	50.9	4.24

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Sutter Mutual Water Company – 2013 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Main Canal	39,690	90	82	11	348	2,460	(2,797)
West Canal	52,530	90	109	14	460	3,256	(3,702)
Central Canal	50,640	75	87	11	370	2,180	(2,538)
East Canal	71,970	75	124	16	525	3,098	(3,607)
Laterals	533,390	12	147	19	623	3,673	(4,277)
Sub-Laterals	146,060	8	27	4	114	268	(378)
TOTAL			575	75	2,439	14,935	(17,299)

^aFrom District statistics.^bAverage width of the conveyance facilities.^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.^dEstimated evaporation from canals, laterals, and drains during the irrigation season.^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Sutter Mutual Water Company

TABLE 6

Sutter Mutual Water Company – 2013 District Water Balance**(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	205,355
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	6,110
Available Soil Moisture ^c	Estimated	1,270
	Total Water Supplies =	212,735
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	14,935
Evaporation - Precipitation (Canals/Laterals)	Table 4	2,364
Riparian ET ^d (Canals/Laterals)	Estimated	500
Conveyance System Filling ^e (Canals/Laterals)	Estimated	2,054
	Total Distribution System =	19,853
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	121,721
Evapotranspiration of Precip - ET _{pr}	Table 5	661
Cultural Practices (includes Leaching Requirement)	Table 5	3,794
	Total Crop Water Needs =	126,177
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	3,517
Rice Cultural and Ecosystem Requirement ^h	Estimated	26,827
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	41,281
	Total District Outflow (from District Records) =	71,625
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	33,062
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	(4,920)

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Sutter Mutual Water Company

TABLE 7

**Sutter Mutual Water Company – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2004	162,114	66,211	-	-	228,325	29,624	-
2005	136,706	54,241	-	-	190,947	12,344	-
2006	143,983	73,001	-	-	216,984	24,799	-
2007	167,922	56,467	-	-	224,389	38,231	-
2008	169,435	30,275	-	-	199,710	45,248	-
2009	153,526	35,436	-	-	188,962	57,303	-
2010	142,185	58,326	0	0	200,511	62,316	77,886
2011	136,388	57,423	0	0	193,811	55,954	98,092
2012	134,711	47,314	0	0	182,025	68,493	60,618
2013	163,680	41,675	0	0	205,355	33,062	71,625
Total	1,510,650	520,369	0	0	2,031,019	427,374	308,221
Average	151,065	52,037	0	0	203,102	42,737	77,055

^aFederal Ag Water Supply from Reclamation Water Account Records. Includes Project water transferred into SMWC in 2006 and 2010.

^bNon-Federal Ag Water Supply from District Records. Data prior to 2010 are not available.

^cEstimated by District based on observation and historical information. Data prior to 2010 are not available.

^dThe Department quit measuring outflow Karnak after 2003; SMWC has calculated outflow since 2010. Data prior to 2010 are not available.

TABLE 1

**Sutter Mutual Water Company – 2014 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	6,048	0	0	0	6,048
May	30,749	0	0	0	30,749
June	32,065	0	0	0	32,065
July	35,388	2,440	0	0	37,828
August	15,000	12,620	0	0	27,620
September	3,750	1,364	0	0	5,114
October	4,125	3,604	0	0	7,729
TOTAL	127,125	20,028	0	0	147,153

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Sutter Mutual Water Company – 2014 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
TOTAL	0	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Sutter Mutual Water Company – 2014 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	6,048	0	6,048
May	30,749	0	30,749
June	32,065	0	32,065
July	37,828	0	37,828
August	27,620	0	27,620
September	5,114	0	5,114
October	7,729	0	7,729
TOTAL	147,153	0	147,153

^aIn addition to the water supplies shown in Table 3, 74,162 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Sutter Mutual Water Company**Sutter Mutual Water Company – 2014 Distribution System Evaporation and Seepage Worksheet**

2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.02	2.4	0.20
Feb	3.7	0.31	2.0	0.17
Mar	1.6	0.14	4.1	0.34
Apr	1.2	0.10	5.9	0.49
May	0.1	0.01	8.4	0.70
Jun	0.0	0.00	9.1	0.76
Jul	0.0	0.00	8.9	0.74
Aug	0.1	0.01	7.3	0.61
Sept	0.4	0.03	5.8	0.48
Oct	0.3	0.03	4.1	0.34
Nov	1.2	0.10	1.8	0.15
Dec	7.3	0.60	1.1	0.09
TOTAL-YR	16	1.33	60.9	5.07
TOTAL-Apr-Oct	2.1	0.17	49.5	4.13

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Sutter Mutual Water Company – 2014 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Main Canal	39,690	90	82	14	338	2,460	(2,784)
West Canal	52,530	90	109	19	448	3,256	(3,685)
Central Canal	50,640	75	87	15	360	2,180	(2,524)
East Canal	71,970	75	124	21	511	3,098	(3,588)
Laterals	533,390	12	147	25	606	3,673	(4,254)
Sub-Laterals	146,060	8	27	5	111	268	(374)
TOTAL			575	99	2,374	14,935	(17,210)

^aFrom District statistics.^bAverage width of the conveyance facilities.^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.^dEstimated evaporation from canals, laterals, and drains during the irrigation season.^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Sutter Mutual Water Company – 2014 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	147,153
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	8,022
Available Soil Moisture ^c	Estimated	3,857
	Total Water Supplies =	159,032
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	14,935
Evaporation - Precipitation (Canals/Laterals)	Table 4	2,275
Riparian ET ^d (Canals/Laterals)	Estimated	411
Conveyance System Filling ^e (Canals/Laterals)	Estimated	1,472
	Total Distribution System =	19,093
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	99,533
Evapotranspiration of Precip - ET _{pr}	Table 5	1,506
Cultural Practices (includes Leaching Requirement)	Table 5	3,670
	Total Crop Water Needs =	104,709
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	22,932
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	5,123
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	74,162
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	30,107

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Sutter Mutual Water Company

TABLE 7

**Sutter Mutual Water Company – 2014 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2005	136,706	54,241	-	-	190,947	12,344	-
2006	143,983	73,001	-	-	216,984	24,799	-
2007	167,922	56,467	-	-	224,389	38,231	-
2008	169,435	30,275	-	-	199,710	45,248	-
2009	153,526	35,436	-	-	188,962	57,303	-
2010	142,185	58,326	0	0	200,511	62,316	77,886
2011	136,388	57,423	0	0	193,811	55,954	98,092
2012	134,711	47,314	0	0	182,025	68,493	60,618
2013	163,680	41,675	0	0	205,355	33,062	71,625
2014	127,125	20,028	0	0	147,153	74,162	5,123
Total	1,348,536	454,158	0	0	1,802,694	397,750	308,221
Average	149,837	50,462	0	0	200,299	44,194	77,055

^aFederal Ag Water Supply from Reclamation Water Account Records. Includes Project water transferred into SMWC in 2006 and 2010.^bNon-Federal Ag Water Supply from District Records. Data prior to 2010 are not available.^cEstimated by District based on observation and historical information. Data prior to 2010 are not available.^dThe Department quit measuring outflow Karnak after 2003; SMWC has calculated outflow since 2010. Data prior to 2010 are not available.

Sutter Mutual Water Company

TABLE 1

**Sutter Mutual Water Company – 2015 Surface Water Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	10,537	0	0	0	10,537
May	32,120	0	0	0	32,120
June	32,728	0	0	0	32,728
July	28,865	7,421	0	0	36,286
August	15,000	8,590	0	0	23,590
September	2,818	0	0	0	2,818
October	4,125	651	0	0	4,776
TOTAL	126,193	16,662	0	0	142,855

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records.^cEstimated by District based on observation and historical information.

TABLE 2

**Sutter Mutual Water Company – 2015 Groundwater Supply
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0
TOTAL	0	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Sutter Mutual Water Company – 2015 Total District Water Supply (excluding reuse)
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	10,537	0	10,537
May	32,120	0	32,120
June	32,728	0	32,728
July	36,286	0	36,286
August	23,590	0	23,590
September	2,818	0	2,818
October	4,776	0	4,776
TOTAL	142,855	0	142,855

^aIn addition to the water supplies shown in Table 3, 73,068 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Sutter Mutual Water Company

Sutter Mutual Water Company – 2015 Distribution System Evaporation and Seepage Worksheet

2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.01	1.3	0.11
Feb	2.1	0.18	2.3	0.19
Mar	0.2	0.02	4.6	0.38
Apr	1.1	0.09	6.6	0.55
May	0.0	0.00	7.5	0.62
Jun	0.0	0.00	8.6	0.72
Jul	0.0	0.00	8.8	0.73
Aug	0.0	0.00	7.8	0.65
Sept	0.0	0.00	5.7	0.48
Oct	0.1	0.01	4.3	0.36
Nov	1.7	0.14	2.2	0.19
Dec	1.3	0.11	1.3	0.11
TOTAL-YR	6.7	0.56	61.0	5.08
TOTAL-Apr-Oct	1.3	0.10	49.3	4.10

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Sutter Mutual Water Company – 2015 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Main Canal	39,690	90	82	9	337	2,460	(2,788)
West Canal	52,530	90	109	11	446	3,256	(3,690)
Central Canal	50,640	75	87	9	358	2,180	(2,529)
East Canal	71,970	75	124	13	509	3,098	(3,594)
Laterals	533,390	12	147	15	603	3,673	(4,261)
Sub-Laterals	146,060	8	27	3	110	268	(376)
TOTAL			575	60	2,362	14,935	(17,237)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

**Sutter Mutual Water Company – 2015 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	142,855
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	4,824
Available Soil Moisture ^c	Estimated	1,333
	Total Water Supplies =	149,011
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	14,935
Evaporation - Precipitation (Canals/Laterals)	Table 4	2,302
Riparian ET ^d (Canals/Laterals)	Estimated	411
Conveyance System Filling ^e (Canals/Laterals)	Estimated	1,429
	Total Distribution System =	19,077
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	102,897
Evapotranspiration of Precip - ET _{pr}	Table 5	1,489
Cultural Practices (includes Leaching Requirement)	Table 5	3,610
	Total Crop Water Needs =	107,996
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	24,899
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	2,603
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	73,068
	Percolation from Agricultural Lands^l (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	19,335

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to result from the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and utilized by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

District/Company

Sutter Mutual Water Company

TABLE 7

**Sutter Mutual Water Company – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2006	143,983	73,001	-	-	216,984	24,799	-
2007	167,922	56,467	-	-	224,389	38,231	-
2008	169,435	30,275	-	-	199,710	45,248	-
2009	153,526	35,436	-	-	188,962	57,303	-
2010	142,185	58,326	0	0	200,511	62,316	77,886
2011	136,388	57,423	0	0	193,811	55,954	98,092
2012	134,711	47,314	0	0	182,025	68,493	60,618
2013	163,680	41,675	0	0	205,355	33,062	71,625
2014	127,125	20,028	0	0	147,153	74,162	5,123
2015	126,193	16,662	0	0	142,855	73,068	2,603
Total	1,465,148	436,607	0	0	1,901,755	532,636	315,947
Average	146,515	43,661	0	0	190,176	53,264	52,658

^aFederal Ag Water Supply from Reclamation Water Account Records. Includes Project water transferred into SMWC in 2006 and 2010.

^bNon-Federal Ag Water Supply from District Records. Data prior to 2010 are not available.

^cEstimated by District based on observation and historical information. Data prior to 2010 are not available.

^dThe Department quit measuring outflow Karnak after 2003; SMWC has calculated outflow since 2010. Data prior to 2010 are not available.

Natomas Central Mutual
Water Company

Natomas Central Mutual Water District

TABLE 1

**Natomas Central Mutual Water District – 2013 Surface Water Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^b (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	4,350	0	0	0	4,350
May	19,198	0	0	0	19,198
June	14,776	0	0	0	14,776
July	13,085	7,200	0	0	20,285
August	3,900	9,197	0	0	13,097
September	2,209	0	0	0	2,209
October	136	0	0	0	136
TOTAL	57,654	16,397	0	0	74,051

^aFederal Ag Water Supply from Reclamation Water Account Records.^bWater from non-Company lands enters the drainage system throughout the April through October period. The quantity for 2013 is unknown at this time but is included in the quantity recycled and reused shown in Table 6.

TABLE 2

**Natomas Central Mutual Water District – 2013 Groundwater Supply
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	10	0
May	10	0
June	10	0
July	10	0
August	10	0
September	10	0
October	0	0
TOTAL	60	0

^aEstimated by District based on observation and historical information.

TABLE 3

**Natomas Central Mutual Water District – 2013 Total District Water Supply (excluding reuse)
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	4,350	10	4,360
May	19,198	10	19,208
June	14,776	10	14,786
July	20,285	10	20,295
August	13,097	10	13,107
September	2,209	10	2,219
October	136	0	136
TOTAL	74,051	60	74,111

^aIn addition to the water supplies shown in Table 3, 49,466 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Natomas Central Mutual Water District**Natomas Central Mutual Water District – 2013 Distribution System Evaporation and Seepage Worksheet**

2015 Sacramento Valley Regional Water Management Plan Annual Update

2013	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.9	0.07	1.7	0.14
Feb	0.2	0.02	2.9	0.25
Mar	1.2	0.10	4.4	0.37
Apr	0.7	0.06	7.4	0.62
May	0.1	0.01	8.3	0.69
Jun	0.2	0.02	8.3	0.69
Jul	0.0	0.00	9.0	0.75
Aug	0.0	0.00	7.6	0.63
Sept	0.6	0.05	5.7	0.48
Oct	0.0	0.00	4.6	0.39
Nov	0.9	0.07	2.8	0.23
Dec	0.3	0.02	2.1	0.18
TOTAL-YR	5.1	0.42	64.8	5.40
TOTAL-Apr-Oct	1.6	0.13	50.9	4.24

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Natomas Central Mutual Water District – 2013 Distribution System Evaporation and Seepage (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Bennet System	44,700	56	58	8	245	579	(816)
Northern System	146,400	54	180	24	765	1,805	(2,546)
Prichard Lake Sys	204,400	54	252	33	1,066	2,515	(3,548)
Elkhorn System	75,100	44	76	10	323	762	(1,075)
Riverside System	65,800	46	69	9	293	692	(976)
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
TOTAL			635	83	2,693	6,353	(8,962)

^aFrom District statistics.^bAverage width of the conveyance facilities.^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.^dEstimated evaporation from canals, laterals, and drains during the irrigation season.^eEstimated seepage from canals, laterals, and drains during the irrigation season.

Natomas Central Mutual Water District

TABLE 6

**Natomas Central Mutual Water District – 2013 District Water Balance
(April through October Period Only)**

2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	74,111
Private Groundwater	Table 2	0
Inflow From Precip ^b	Estimated	2,598
Available Soil Moisture ^c	Estimated	281
	Total Water Supplies =	76,990
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	6,353
Evaporation - Precipitation (Canals/Laterals)	Table 4	2,609
Riparian ET ^d (Canals/Laterals)	Estimated	526
Conveyance System Filling ^e (Canals/Laterals)	Estimated	741
	Total Distribution System =	10,229
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	55,250
Evapotranspiration of Precip - ET _{pr}	Table 5	243
Cultural Practices (includes Leaching Requirement)	Table 5	1,231
	Total Crop Water Needs =	56,725
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	14,688
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	3,952
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	49,466
	Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	6,084

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

Natomas Central Mutual Water District

TABLE 7

**Natomas Central Mutual Water District – 2013 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2004	80,229	13,476	-	-	93,705	35,443	0
2005	58,239	22,000	-	-	80,239	33,030	0
2006	51,146	21,694	-	-	72,840	21,441	0
2007	51,847	13,008	-	-	64,855	39,502	0
2008	48,297	8,919	-	-	57,216	43,359	0
2009	41,778	10,997	-	-	52,775	44,224	0
2010	37,349	8,707	0	0	46,056	39,989	15,000
2011	35,685	8,322	0	0	44,007	59,923	15,115
2012	48,050	13,073	0	28,288	89,411	51,433	10,317
2013	57,654	16,397	0	0	74,051	49,466	3,952
Total	510,274	136,593	0	28,288	675,155	417,811	44,384
Average	51,027	13,659	0	7,072	67,516	41,781	4,438

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records. Data prior to 2010 not available.^cEstimated by District based on observation and historical information. Data prior to 2010 not available.^dData prior to 2010 are not available.

TABLE 1

Natomas Central Mutual Water District – 2014 Surface Water Supply
2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^b (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	636	0	0	0	636
May	19,511	0	0	0	19,511
June	16,659	0	0	0	16,659
July	14,962	5,400	0	0	20,362
August	2,925	9,693	0	0	12,618
September	842	0	0	0	842
October	2,720	0	0	0	2,720
TOTAL	58,255	15,093	0	0	73,348

^aFederal Ag Water Supply from Reclamation Water Account Records.^bWater from non-Company lands enters the drainage system throughout the April through October period. The quantity for 2014 is unknown at this time but is included in the quantity recycled and reused shown in Table 6.

TABLE 2

Natomas Central Mutual Water District – 2014 Groundwater Supply
2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	10	0
May	10	380
June	10	1,870
July	10	2,388
August	10	2,025
September	10	371
October	0	0
TOTAL	60	7,033

^aEstimated by District based on observation and historical information.

TABLE 3

Natomas Central Mutual Water District – 2014 Total District Water Supply (excluding reuse)
2015 Sacramento Valley Regional Water Management Plan Annual Update

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	636	10	646
May	19,511	10	19,521
June	16,659	10	16,669
July	20,362	10	20,372
August	12,618	10	12,628
September	842	10	852
October	2,720	0	2,720
TOTAL	73,348	60	73,408

^aIn addition to the water supplies shown in Table 3, 65,147 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Natomas Central Mutual Water District – 2014 Distribution System Evaporation and Seepage Worksheet
2015 Sacramento Valley Regional Water Management Plan Annual Update

2014	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.2	0.02	2.4	0.20
Feb	3.7	0.31	2.0	0.17
Mar	1.6	0.14	4.1	0.34
Apr	1.2	0.10	5.9	0.49
May	0.1	0.01	8.4	0.70
Jun	0.0	0.00	9.1	0.76
Jul	0.0	0.00	8.9	0.74
Aug	0.1	0.01	7.3	0.61
Sept	0.4	0.03	5.8	0.48
Oct	0.3	0.03	4.1	0.34
Nov	1.2	0.10	1.8	0.15
Dec	7.3	0.60	1.1	0.09
TOTAL-YR	16.0	1.33	60.9	5.07
TOTAL-Apr-Oct	2.1	0.17	49.5	4.13

^aAverage precipitation reported for CIMIS Stations at CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET₀) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Natomas Central Mutual Water District – 2014 Distribution System Evaporation and Seepage
2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Bennet System	44,700	56	58	10	239	579	(808)
Northern System	146,400	54	180	31	744	1,805	(2,518)
Prichard Lake Sys	204,400	54	252	43	1,037	2,515	(3,509)
Elkhorn System	75,100	44	76	13	314	762	(1,063)
Riverside System	65,800	46	69	12	285	692	(965)
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
TOTAL			635	109	2,620	6,353	(8,864)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 6

Natomas Central Mutual Water District – 2014 District Water Balance
2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	73,408
Private Groundwater	Table 2	7,033
Inflow From Precip ^b	Estimated	3,017
Available Soil Moisture ^c	Estimated	589
	Total Water Supplies =	84,048
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	6,353
Evaporation - Precipitation (Canals/Laterals)	Table 4	2,511
Riparian ET ^d (Canals/Laterals)	Estimated	559
Conveyance System Filling ^e (Canals/Laterals)	Estimated	733
	Total Distribution System =	10,156
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	59,946
Evapotranspiration of Precip - ET _{pr}	Table 5	771
Cultural Practices (includes Leaching Requirement)	Table 5	1,286
	Total Crop Water Needs =	62,003
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	16,519
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	2,028
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	65,147
Percolation from Agricultural Lands^k (Total Supplies - Distribution System - Crop Water Needs - District Outflows)		9,862

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

^kPercolation from Agricultural Lands is the closure term in the mass water balance. As such, in addition to any percolation to the groundwater basin, the quantity shown includes unaccounted for drain water outflow, any errors in assumptions used in calculations or estimated uses such as crop water use (ET), effective precipitation, evaporation, groundwater recharge, etc. A positive value indicates assumed percolation to groundwater greater than groundwater pumping. A negative value may indicate unaccounted for groundwater pumping from privately owned wells.

TABLE 7

Natomas Central Mutual Water District – 2014 Annual Water Quantities Delivered under Each Right or Contract
2015 Sacramento Valley Regional Water Management Plan Annual Update

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2005	58,239	22,000	-	-	80,239	33,030	-
2006	51,146	21,694	-	-	72,840	21,441	-
2007	51,847	13,008	-	-	64,855	39,502	-
2008	48,297	8,919	-	-	57,216	43,359	-
2009	41,778	10,997	-	-	52,775	44,224	-
2010	37,349	8,707	0	0	46,056	39,989	15,000
2011	35,685	8,322	0	0	44,007	59,923	15,115
2012	48,050	13,073	0	0	89,411	51,433	10,317
2013	57,654	16,397	0	0	74,051	49,466	3,952
2014	58,255	15,093	0	0	73,348	65,147	2,028
Total	430,045	123,117	0	0	581,450	382,368	44,384
Average	47,783	13,680	0	0	64,606	42,485	11,096

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records. Data prior to 2010 not available.^cEstimated by District based on observation and historical information. Data prior to 2010 not available.^dData prior to 2010 are not available.

TABLE 1

Natomas Central Mutual Water District – 2015 Surface Water Supply*2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^b (acre-feet)	Total (acre-feet)
	Base Supply (acre-feet)	Project Water (acre-feet)			
Method	M-1	M-1	M-1	E-3	
April	3,620	0	0	0	3,620
May	17,147	0	0	0	17,147
June	16,821	0	0	0	16,821
July	13,341	5,400	0	0	18,741
August	2,925	8,018	0	0	10,943
September	316	0	0	0	316
October	30	0	0	0	30
TOTAL	54,200	13,418	0	0	67,618

^aFederal Ag Water Supply from Reclamation Water Account Records.^bWater from non-Company lands enters the drainage system throughout the April through October period. The quantity for 2015 is unknown at this time but is included in the quantity recycled and reused shown in Table 6.

TABLE 2

Natomas Central Mutual Water District – 2015 Groundwater Supply*2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	District Groundwater (acre-feet)	Private Groundwater ^a (acre-feet)
Method	M-1	E-1
April	0	0
May	10	2,171
June	10	3,916
July	10	3,149
August	10	3,420
September	10	1,991
October	0	0
TOTAL	50	14,647

^aEstimated by District based on observation and historical information.

TABLE 3

Natomas Central Mutual Water District – 2015 Total District Water Supply (excluding reuse)*2015 Sacramento Valley Regional Water Management Plan Annual Update*

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Total District Water Supply ^a (acre-feet)
Method	M-1	M-1	M-1
April	3,620	0	3,620
May	17,147	10	17,157
June	16,821	10	16,831
July	18,741	10	18,751
August	10,943	10	10,953
September	316	10	326
October	30	0	30
TOTAL	67,618	50	67,668

^aIn addition to the water supplies shown in Table 3, 53,092 acre-feet were recirculated by the District for reuse within its boundaries. This recirculation and reuse is an integral component of the District's total water supply.

Natomas Central Mutual Water District**Natomas Central Mutual Water District – 2015 Distribution System Evaporation and Seepage Worksheet**
2015 Sacramento Valley Regional Water Management Plan Annual Update

2015	Precipitation ^a		Evaporation ^b	
	inches	feet	inches	feet
Jan	0.1	0.01	1.3	0.11
Feb	2.1	0.18	2.3	0.19
Mar	0.2	0.02	4.6	0.38
Apr	1.1	0.09	6.6	0.55
May	0.0	0.00	7.5	0.62
Jun	0.0	0.00	8.6	0.72
Jul	0.0	0.00	8.8	0.73
Aug	0.0	0.00	7.8	0.65
Sept	0.0	0.00	5.7	0.48
Oct	0.1	0.01	4.3	0.36
Nov	1.7	0.14	2.2	0.19
Dec	1.3	0.11	1.3	0.11
TOTAL-YR	6.7	0.56	61.0	5.08
TOTAL-Apr-Oct	1.3	0.10	49.3	4.10

^aAverage precipitation reported for CIMIS Stations at Davis (#6), Colusa (#32), and Verona (#235).

^bMonthly evaporation from Distribution System water surfaces is estimated as 1.1 x the average reference ET (ET_o) reported for for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

TABLE 4

Natomas Central Mutual Water District – 2015 Distribution System Evaporation and Seepage
2015 Sacramento Valley Regional Water Management Plan Annual Update

Canal, Pipeline, Lateral, Reservoir	Length ^a (feet)	Width ^b (feet)	Surface Area (acres)	Precipitation ^c (acre-feet)	Evaporation ^d (acre-feet)	Seepage ^e (acre-feet)	Total (acre-feet)
Bennet System	44,700	56	58	6	238	579	(810)
Northern System	146,400	54	180	19	741	1,805	(2,527)
Prichard Lake Sys	204,400	54	252	26	1,032	2,515	(3,521)
Elkhorn System	75,100	44	76	8	313	762	(1,067)
Riverside System	65,800	46	69	7	284	692	(969)
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
TOTAL			635	66	2,608	6,353	(8,894)

^aFrom District statistics.

^bAverage width of the conveyance facilities.

^cEstimated inflow resulting from precipitation on canals, laterals, and drains during the irrigation season.

^dEstimated evaporation from canals, laterals, and drains during the irrigation season.

^eEstimated seepage from canals, laterals, and drains during the irrigation season.

TABLE 5

Natomas Central Mutual Water District – 2015 Crop Consumptive Use Water Needs (April through October Period Only)

2015 Sacramento Valley Regional Water Management Plan Annual Update

Crop Name	Acres ^a (crop acres)	Crop ET ^b (AF/Ac)	Effective Precipitation ^c		ETAW (acre-feet)	Leaching Requirement	
			(AF/Ac)	(acre-feet)		(AF/Ac)	(acre-feet)
Alfalfa	570	3.13	0.03	17	1,765	0.11	63
Beans	85	0.77	0.03	3	63	0.47	40
Corn	49	1.94	0.03	1	93	0.14	7
Golf Course	120	3.38	0.03	4	402	0.03	4
Hops	4	0.91	0.03	0	4	0.18	1
Idle	1,132	0.16	0.03	34	147	0.00	0
Kiwis	1	2.92	0.03	0	2	0.18	0
Managed Marsh	743	2.97	0.03	22	2,184	0.00	0
Melons	3	1.12	0.00	0	4	0.04	0
Milo	59	1.94	0.03	2	112	0.02	1
Misc. field crops	329	1.74	0.03	10	562	0.18	59
Oats	655	0.77	0.03	20	483	0.02	13
Onions	18	0.86	0.03	1	15	0.28	5
Pasture	31	3.31	0.03	1	102	0.03	1
Pears	1	2.95	0.03	0	2	0.18	0
Peppers	3	1.65	0.03	0	5	0.08	0
Pumpkins	35	1.12	0.00	0	40	0.04	1
Rice	15,876	3.01	0.03	476	47,388	0.06	953
Rice Straw Decomp	0	0.50	0.03	0	0	0.00	0
Squash	165	1.12	0.00	0	185	0.04	7
Sunflowers	205	1.84	0.03	6	370	0.06	12
Tomatoes	58	1.65	0.03	2	94	0.08	5
Crop Acres	20,141			598	54,022		1,172
Total Irrig. Acres	19,009	(If this number is larger than your known total, it may be due to double cropping.)					

^a Acres include lands, if any, irrigated by private wells.^b Crop ET (ETc) was calculated as average ETo for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235) x Kc based on ITRC Dry Year ETc for Zone 12 surface irrigation for water balances. Crop ET does not include water required for initial flooding, reflooding, or flow through on rice acres. This quantity is estimated to be approximately 1.25 to 1.5 acre-feet per acre (approximately 19,850 to 24,000 acre-feet in 2015).^c Effective Precipitation is estimated as 60% of monthly precipitation greater than 0.5 inch during crop growing season. Because of the nature of flooded areas, such as rice field

TABLE 6

Natomas Central Mutual Water District – 2015 District Water Balance
2015 Sacramento Valley Regional Water Management Plan Annual Update

Water Supplies (excluding recirculation)^a		
District Water Supply (includes District Groundwater)	Table 3	67,668
Private Groundwater	Table 2	14,647
Inflow From Precip ^b	Estimated	2,098
Available Soil Moisture ^c	Estimated	219
	Total Water Supplies =	84,632
Distribution System Evaporation and Seepage		
Seepage (Canals/Laterals)	Table 4	6,353
Evaporation - Precipitation (Canals/Laterals)	Table 4	2,541
Riparian ET ^d (Canals/Laterals)	Estimated	592
Conveyance System Filling ^e (Canals/Laterals)	Estimated	676
	Total Distribution System =	10,162
Crop Consumptive Use Water Needs^f		
Evapotranspiration of Applied Water - ETAW (includes Evap from Rice Straw Decomposition)	Table 5	54,022
Evapotranspiration of Precip - ET _{pr}	Table 5	598
Cultural Practices (includes Leaching Requirement)	Table 5	1,172
	Total Crop Water Needs =	55,793
District Outflows		
Water Supply Delivered to Other Districts or Users	District Records	0
Irrigation Season Rainfall Runoff ^g	Estimated	0
Rice Cultural and Ecosystem Requirement ^h	Estimated	15,876
Upslope Drainwater Flow Through ⁱ	Estimated	0
Remainder Drainwater Outflow ^j	Calculated	0
	Total District Outflow (from District Records) =	2,167
Internal Recirculation and Reuse		
Total Quantity Recirculated for Reuse	District Records	53,092
	Percolation from Agricultural Lands^l (Total Supplies - Distribution System - Crop Water Needs - District Outflows)	16,510

^aWater Supplies - Includes surface and groundwater supplies diverted or pumped into the District to meet Crop Consumptive Use Water Needs, District Operational needs, and water required for cultural practice needs (e.g., flooding, reflooding, and flow through for rice cultivation). Does not include water recirculated by the District.

^bInflow from Precipitation is calculated as total April - October precipitation x Total Crop Acres minus Rice Straw Decomp acres.

^cAvailable Soil Moisture is estimated as a 10% of Jan precip + 30% of Feb precip + 50% of Mar precip on Non-Rice and Non-Habitat acres.

^dRiparian ET is estimated based on observation.

^eConveyance System Filling - Quantity estimated by the District required to initially fill conveyance canals and laterals. The conveyance systems are typically drained after October 31.

^fCrop Consumptive Use Water Needs do not include quantities required for flood-up or flow through for rice.

^gIrrigation Season Rainfall Runoff - Portion of District Outflow estimated to be the result of rainfall that cannot be captured or recirculated. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

^hRice Cultural and Ecosystem Requirement - Portion of District Outflow estimated to be due to the cultural requirements for rice flood-up and flow through. This water is available to downstream water users, for instream flow, and to meet Delta Outflow requirements.

ⁱUpslope drainwater flow through is 50% of April, May, and June upslope water, limited by the Total District Outflow.

^jDrainwater Outflow - Outflow from operational spills and end-of-season drainage. This water is available to (and used by) downstream water users, for instream flow, and to meet Delta Outflow requirements.

TABLE 7

**Natomas Central Mutual Water District – 2015 Annual Water Quantities Delivered under Each Right or Contract
(April through October Period Only)***2015 Sacramento Valley Regional Water Management Plan Annual Update*

Year	Federal Ag Water Supply ^a		Non-Federal Ag Water Supply ^b (acre-feet)	Upslope Drainwater ^c (acre-feet)	Total (acre-feet)	District	
	Base Supply (acre-feet)	Project Water (acre-feet)				Recapture (acre-feet)	Outflow ^d (acre-feet)
2006	51,146	21,694	-	-	72,840	21,441	-
2007	51,847	13,008	-	-	64,855	39,502	-
2008	48,297	8,919	-	-	57,216	43,359	-
2009	41,778	10,997	-	-	52,775	44,224	-
2010	37,349	8,707	0	0	46,056	39,989	15,000
2011	35,685	8,322	0	0	44,007	59,923	15,115
2012	48,050	13,073	0	28,288	89,411	51,433	10,317
2013	57,654	16,397	0	0	74,051	49,466	3,952
2014	58,255	15,093	0	0	73,348	65,147	2,028
2015	54,200	13,418	0	0	67,618	53,092	2,167
Total	484,261	129,628	0	28,288	642,177	467,577	48,579
Average	48,426	12,963	0	4,715	64,218	46,758	8,097

^aFederal Ag Water Supply from Reclamation Water Account Records.^bNon-Federal Ag Water Supply from District Records. Data prior to 2010 not available.^cEstimated by District based on observation and historical information. Data prior to 2010 not available.^dData prior to 2010 are not available.

2013–2015 Crop Evapotranspiration
Tables: Redding Sub-basin

Regional Water Management Plan Update
Evapotranspiration and Effective Precipitation - 2013

2015 Sacramento Valley Regional Water Management Plan Annual Update

	2013	April	May	June	July	August	September	October	Total Growing Season Etc	April	May	June	July	August	September	October	Effective Precip
	Precipitation	0.33	0.67	0.51	0.00	0.01	0.48	0.00		0.33	0.67	0.51	0.00	0.01	0.48	0.00	
	Grass Reference ETo	6.29	7.64	8.52	9.12	7.39	5.66	4.26									60%
Crop Type	ITRC Representative Crop	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(AF)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(feet)
Alfalfa	Alfalfa Hay and Clover	6.53	6.45	7.34	7.60	6.44	4.80	0.00	3.26	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.01
Pasture	Pasture and Misc. Grasses	5.44	6.96	7.94	8.41	6.77	5.14	0.00	3.39	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.01
Walnuts	Walnuts	2.91	5.82	8.87	9.39	7.62	5.13	0.00	3.31	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.01

Source: Kc values from *California Crop and Soil Evapotranspiration*, ITRC Report 03-001, January 2003.

Notes:

Crop ET (ETc) was calculated as ETo for CIMIS Station at Gerber (#8) x Kc based on ITRC Dry Year Etc for Zone 14 surface irrigation for water balances. Water Needs do not include water required for cultural practices

Precipitation is the 2013 monthly precipitation reported for the CIMIS Station at Gerber (#8).

Effective precipitation was estimated as 60% of rainfall greater than 0.5 inch per month occurring during the growing season.

Regional Water Management Plan Update
Evapotranspiration and Effective Precipitation - 2014

2015 Sacramento Valley Regional Water Management Plan Annual Update

	2014	April	May	June	July	August	September	October	Total Growing Season	April	May	June	July	August	September	October	Effective Precip
	Precipitation	0.13	0.01	0.00	0.00	0.04	0.83	1.22		0.13	0.01	0.00	0.00	0.04	0.83	1.22	
	Grass Reference ETo	4.86	7.3	8.61	8.61	7.56	5.63	2.97									60%
Crop Type	ITRC Representative Crop	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(AF)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(feet)
Alfalfa	Alfalfa Hay and Clover	5.05	6.16	7.42	7.18	6.59	4.78	0.00	3.10	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.02
Pasture	Pasture and Misc. Grasses	4.20	6.65	8.02	7.94	6.92	5.11	0.00	3.24	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.02
Walnuts	Walnuts	2.25	5.56	8.96	8.86	7.79	5.10	0.00	3.21	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.02

Source: Kc values from *California Crop and Soil Evapotranspiration*, ITRC Report 03-001, January 2003.

Notes:

Crop ET (ETc) was calculated as ETo for CIMIS Station at Shasta College (#224) x Kc based on ITRC Dry Year ETc for Zone 14 surface irrigation for water balances. Water Needs do not include water required for cultural practices. Precipitation is the 2014 monthly precipitation reported for the CIMIS Station at Shasta College (#224).

Effective precipitation was estimated as 60% of rainfall greater than 0.5 inch per month occurring during the growing season.

Regional Water Management Plan Update
Evapotranspiration and Effective Precipitation - 2015

2015 Sacramento Valley Regional Water Management Plan Annual Update

	2015	April	May	June	July	August	September	October	Total Growing Season Etc	April	May	June	July	August	September	October	Effective Precip
	Precipitation	1.31	0.01	0.00	0.01	0.00	0.05	0.19		1.31	0.01	0.00	0.01	0.00	0.05	0.19	
	Grass Reference ETo	6.13	7.42	8.7	8.37	7.16	5.11	3.97									60%
Crop Type	ITRC Representative Crop	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(AF)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(feet)
Alfalfa	Alfalfa Hay and Clover	6.37	6.26	7.50	6.98	6.24	4.34	0.00	3.14	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Pasture	Pasture and Misc. Grasses	5.30	6.76	8.10	7.72	6.56	4.64	0.00	3.26	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Walnuts	Walnuts	2.83	5.65	9.06	8.62	7.38	4.63	0.00	3.18	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.04

Source: Kc values from *California Crop and Soil Evapotranspiration*, ITRC Report 03-001, January 2003.

Notes:

Crop ET (ETc) was calculated as ETo for CIMIS Station at Gerber South (#222) x Kc based on ITRC Dry Year ETc for Zone 14 surface irrigation for water balances. Water Needs do not include water required for cultural practices

Precipitation is the 2014 monthly precipitation reported for the CIMIS Station at Gerber South (#222)

Effective precipitation was estimated as 60% of rainfall greater than 0.5 inch per month occurring during the growing season.

2013–2015 Crop Evapotranspiration
Tables: Colusa, Butte, Sutter, and
American Sub-basins

Regional Water Management Plan Update
Evapotranspiration and Effective Precipitation - 2013
 2015 Sacramento Valley Regional Water Management Plan Annual Update

Crop Type	ITRC Representative Crop	2013								Total Growing Season Etc	2013								Effective Precip
		April	May	June	July	August	September	October	April		May	June	July	August	September	October			
		Precipitation	Grass Reference ETo	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)		(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(feet)	
		0.66	0.13	0.18	0.00	0.00	0.60	0.00		0.66	0.13	0.18	0.00	0.00	0.60	0.00	60%		
		6.73	7.50	7.54	8.17	6.90	5.19	4.21											
Alfalfa	Alfalfa Hay and Clover	7.09	6.35	6.47	6.68	6.00	4.37	1.80	3.23	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Almonds	Almonds	4.76	6.05	6.17	6.86	5.60	4.28	2.87	3.05	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Barley	Grain and Grain Hay	6.88	3.39	0.00	0.00	0.00	0.00	0.00	0.86	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Beans	Grain and Grain Hay	6.88	3.39	0.00	0.00	0.00	0.00	0.00	0.86	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Buckwheat	Grain and Grain Hay	6.88	3.39	0.00	0.00	0.00	0.00	0.00	0.86	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Cantelope	Melons, Squash, and Cucumbers	0.00	0.86	1.34	4.57	5.23	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00		
Chestnuts	Almonds	4.76	6.05	6.17	6.86	5.60	4.28	2.87	3.05	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Corn	Corn and Grain Sorghum	2.33	2.46	6.41	7.62	4.77	0.00	0.00	1.97	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Cotton	Cotton	2.24	1.42	4.34	7.98	6.85	4.74	1.41	2.41	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Cover Crop	Pasture and Misc. Grasses	5.88	6.82	6.89	7.39	6.29	4.74	2.97	3.42	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Cucumbers	Melons, Squash, and Cucumbers	0.00	0.86	1.34	4.57	5.23	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00		
Golf course	N/A								3.38	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Grain	Grain and Grain Hay	6.88	3.39	0.00	0.00	0.00	0.00	0.00	0.86	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Grapes	Grape Vines with 80% canopy	2.52	3.33	5.45	5.68	4.56	2.71	0.00	2.02	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Habitat	Citrus (no ground cover)	5.53	4.92	4.95	5.18	4.43	3.42	2.70	2.59	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Habitat	N/A								3.24	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Hay	Grain and Grain Hay	6.88	3.39	0.00	0.00	0.00	0.00	0.00	0.86	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Hops	Small Vegetables	6.75	1.78	0.19	0.00	1.03	1.37	0.77	0.99	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Idle	Idle	1.45	0.11	0.19	0.00	0.02	0.21	0.12	0.17	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Kiwis	N/A								2.92	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Managed Marsh	N/A								2.97	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Melons	Melons, Squash, and Cucumbers	0.00	0.86	1.34	4.57	5.23	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00		
Melons, Squash	Melons, Squash, and Cucumbers	0.00	0.86	1.34	4.57	5.23	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00		
Milo	Corn and Grain Sorghum	2.33	2.46	6.41	7.62	4.77	0.00	0.00	1.97	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Misc. Deciduous	Misc. Deciduous	4.01	5.67	6.24	6.71	5.75	4.11	2.41	2.91	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Misc. field crops	Misc. field crops	2.33	2.52	6.55	7.23	2.55	0.00	0.00	1.77	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Mixed Truck	Small Vegetables	6.75	1.78	0.19	0.00	1.03	1.37	0.77	0.99	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Oats	Grain and Grain Hay	6.88	3.39	0.00	0.00	0.00	0.00	0.00	0.86	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Olives	Avocado	4.01	5.67	6.24	6.71	5.75	4.11	2.41	2.91	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Onions	Onions and Garlic	5.79	4.81	0.81	0.00	0.00	0.00	0.00	0.95	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Pasture	Pasture and Misc. Grasses	5.88	6.82	6.89	7.39	6.29	4.74	2.97	3.42	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Peach	Peach, Nectarine and Apricots	3.87	5.83	6.50	6.97	5.97	4.38	2.28	2.98	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Pears	Apple, Pear, Cherry, Plum and Prune	4.11	5.99	6.52	7.18	5.91	4.37	2.23	3.02	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Pecans	Almonds	4.76	6.05	6.17	6.86	5.60	4.28	2.87	3.05	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Peppers	Tomatoes and Peppers	2.17	3.83	7.34	6.53	0.42	0.00	0.00	1.69	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Persimmons	Apple, Pear, Cherry, Plum and Prune	4.11	5.99	6.52	7.18	5.91	4.37	2.23	3.02	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Prunes	Apple, Pear, Cherry, Plum and Prune	4.11	5.99	6.52	7.18	5.91	4.37	2.23	3.02	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Pumpkins	Melons, Squash, and Cucumbers	0.00	0.86	1.34	4.57	5.23	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00		
Rice	Rice	2.09	6.99	8.38	9.18	7.71	2.41	0.00	3.06	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Rice Straw Decomp	N/A								0.5	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Safflowers	Safflower and Sunflower	6.54	7.91	7.37	1.44	0.00	0.00	0.00	1.94	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Squash	Melons, Squash, and Cucumbers	0.00	0.86	1.34	4.57	5.23	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00		
Strawberries	Strawberries	2.33	2.52	6.55	7.23	2.55	0.00	0.00	1.77	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Sudan	Pasture and Misc. Grasses	5.88	6.82	6.89	7.39	6.29	4.74	2.97	3.42	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		
Sunflowers	Safflower and Sunflower	6.54	7.91	7.37	1.44	0.00	0.00	0.00	1.94	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Tomatoes	Tomatoes and Peppers	2.17	3.83	7.34	6.53	0.42	0.00	0.00	1.69	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Vegetables	Small Vegetables	6.75	1.78	0.19	0.00	1.03	1.37	0.77	0.99	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01		

RDD/122750001 (ET and Eff Precip Tables.xlsx)

Regional Water Management Plan Update
Evapotranspiration and Effective Precipitation - 2013

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	2013								Total Growing Season Etc									Effective Precip
	April	May	June	July	August	September	October	April		May	June	July	August	September	October			
	Precipitation									0.66	0.13	0.18	0.00	0.00	0.60	0.00		
	Grass Reference ETo									6.73	7.50	7.54	8.17	6.90	5.19	4.21		
Crop Type	ITRC Representative Crop	(inches)	(AF)	(inches)	(feet)													
Vetch	Pasture and Misc. Grasses	5.88	6.82	6.89	7.39	6.29	4.74	2.97	3.42	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01	
Vinseed	Small Vegetables	6.75	1.78	0.19	0.00	1.03	1.37	0.77	0.99	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01	
Walnuts	Walnuts	3.35	5.62	7.64	8.15	6.84	4.71	2.65	3.25	0.10	0.00	0.00	0.00	0.00	0.06	0.00	0.01	
Watermelon	Melons, Squash, and Cucumbers	0.00	0.86	1.34	4.57	5.23	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	
Wheat	Grain and Grain Hay	6.88	3.39	0.00	0.00	0.00	0.00	0.00	0.86	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.01	

Source: Kc values from *California Crop and Soil Evapotranspiration*, ITRC Report 03-001, January 2003.

Notes:

Crop ET (ETc) was calculated as average ETo for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235) x Kc based on ITRC Dry Year ETc for Zone 12 surface irrigation for water balances. Crop ET does not include water required for initial flooding, reflooding, or flow through on rice acres.

Precipitation is the 2013 average monthly precipitation reported for the CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

Effective precipitation was estimated as 60% of rainfall greater than 0.5 inch per month occurring during the growing season.

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	2014								Total Growing Season Etc	April	May	June	July	August	September	October	Effective Precip
	Precipitation	April	May	June	July	August	September	October									
	Grass Reference ETo	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)									
Crop Type	ITRC Representative Crop	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(AF)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(feet)	
Alfalfa	Alfalfa Hay and Clover	5.67	6.47	7.11	6.58	5.79	4.43	1.59	3.14	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Almonds	Almonds	3.81	6.17	6.78	6.76	5.41	4.34	2.53	2.98	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Barley	Grain and Grain Hay	5.50	3.46	0.00	0.00	0.00	0.00	0.00	0.75	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Beans	Grain and Grain Hay	5.50	3.46	0.00	0.00	0.00	0.00	0.00	0.75	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Buckwheat	Grain and Grain Hay	5.50	3.46	0.00	0.00	0.00	0.00	0.00	0.75	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Cantelope	Melons, Squash, and Cucumbers	0.00	0.88	1.48	4.50	5.05	1.51	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chestnuts	Almonds	3.81	6.17	6.78	6.76	5.41	4.34	2.53	2.98	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Corn	Corn and Grain Sorghum	1.86	2.51	7.04	7.51	4.60	0.00	0.00	1.96	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Cotton	Cotton	1.79	1.45	4.76	7.86	6.61	4.82	1.24	2.38	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Cover Crop	Pasture and Misc. Grasses	4.70	6.95	7.57	7.28	6.08	4.82	2.61	3.33	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Cucumbers	Melons, Squash, and Cucumbers	0.00	0.88	1.48	4.50	5.05	1.51	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Golf course	N/A								3.38	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Grain	Grain and Grain Hay	5.50	3.46	0.00	0.00	0.00	0.00	0.00	0.75	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Grapes	Grape Vines with 80% canopy	2.01	3.40	5.99	5.59	4.41	2.75	0.00	2.01	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Habitat	Citrus (no ground cover)	4.42	5.01	5.44	5.10	4.28	3.48	2.38	2.51	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Habitat	N/A								3.24	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Hay	Grain and Grain Hay	5.50	3.46	0.00	0.00	0.00	0.00	0.00	0.75	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Hops	Small Vegetables	5.40	1.81	0.21	0.00	0.99	1.39	0.68	0.87	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Idle	Idle	1.16	0.11	0.21	0.00	0.02	0.21	0.10	0.15	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Kiwis	N/A								2.92	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Managed Marsh	N/A								2.97	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Melons	Melons, Squash, and Cucumbers	0.00	0.88	1.48	4.50	5.05	1.51	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Melons, Squash	Melons, Squash, and Cucumbers	0.00	0.88	1.48	4.50	5.05	1.51	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Milo	Corn and Grain Sorghum	1.86	2.51	7.04	7.51	4.60	0.00	0.00	1.96	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Misc. Deciduous	Misc. Deciduous	3.20	5.79	6.86	6.61	5.55	4.17	2.12	2.86	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Misc. field crops	Misc. field crops	1.86	2.57	7.19	7.12	2.46	0.00	0.00	1.77	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Mixed Truck	Small Vegetables	5.40	1.81	0.21	0.00	0.99	1.39	0.68	0.87	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Oats	Grain and Grain Hay	5.50	3.46	0.00	0.00	0.00	0.00	0.00	0.75	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Olives	Avocado	3.20	5.79	6.86	6.61	5.55	4.17	2.12	2.86	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Onions	Onions and Garlic	4.63	4.91	0.89	0.00	0.00	0.00	0.00	0.87	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Pasture	Pasture and Misc. Grasses	4.70	6.95	7.57	7.28	6.08	4.82	2.61	3.33	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Peach	Peach, Nectarine and Apricots	3.09	5.95	7.15	6.86	5.76	4.44	2.01	2.94	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Pears	Apple, Pear, Cherry, Plum and Prune	3.28	6.11	7.16	7.07	5.70	4.43	1.97	2.98	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Pecans	Almonds	3.81	6.17	6.78	6.76	5.41	4.34	2.53	2.98	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Peppers	Tomatoes and Peppers	1.73	3.90	8.06	6.44	0.41	0.00	0.00	1.71	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Persimmons	Apple, Pear, Cherry, Plum and Prune	3.28	6.11	7.16	7.07	5.70	4.43	1.97	2.98	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Prunes	Apple, Pear, Cherry, Plum and Prune	3.28	6.11	7.16	7.07	5.70	4.43	1.97	2.98	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Pumpkins	Melons, Squash, and Cucumbers	0.00	0.88	1.48	4.50	5.05	1.51	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rice	Rice	1.67	7.13	9.21	9.04	7.44	2.45	0.00	3.08	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Rice Straw Decomp	N/A								0.5	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Safflowers	Safflower and Sunflower	5.23	8.07	8.10	1.42	0.00	0.00	0.00	1.90	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Squash	Melons, Squash, and Cucumbers	0.00	0.88	1.48	4.50	5.05	1.51	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Strawberries	Strawberries	1.86	2.57	7.19	7.12	2.46	0.00	0.00	1.77	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Sudan	Pasture and Misc. Grasses	4.70	6.95	7.57	7.28	6.08	4.82	2.61	3.33	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Sunflowers	Safflower and Sunflower	5.23	8.07	8.10	1.42	0.00	0.00	0.00	1.90	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Tomatoes	Tomatoes and Peppers	1.73	3.90	8.06	6.44	0.41	0.00	0.00	1.71	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03

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	2014								Total Growing Season Etc									Effective Precip	
	April	May	June	July	August	September	October	April		May	June	July	August	September	October				
	Precipitation									1.15	0.11	0.00	0.00	0.06	0.40	0.34			
	Grass Reference ETo									5.38	7.65	8.28	8.05	6.66	5.27	3.71			60%
Crop Type	ITRC Representative Crop	(inches)	(AF)	(inches)	(feet)														
Vegetables	Small Vegetables	5.40	1.81	0.21	0.00	0.99	1.39	0.68	0.87	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Vetch	Pasture and Misc. Grasses	4.70	6.95	7.57	7.28	6.08	4.82	2.61	3.33	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Vinseed	Small Vegetables	5.40	1.81	0.21	0.00	0.99	1.39	0.68	0.87	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Walnuts	Walnuts	2.68	5.73	8.39	8.03	6.60	4.79	2.34	3.21	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Watermelon	Melons, Squash, and Cucumbers	0.00	0.88	1.48	4.50	5.05	1.51	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Wheat	Grain and Grain Hay	5.50	3.46	0.00	0.00	0.00	0.00	0.00	0.75	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.03		

Source: Kc values from *California Crop and Soil Evapotranspiration*, ITRC Report 03-001, January 2003.

Notes:

Crop ET (ETc) was calculated as average ETo for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235) x Kc based on ITRC Dry Year ETc for Zone 12 surface irrigation for water balances. Crop ET does not include water required for initial flooding, reflooding, or flow through on rice acres.

Precipitation is the 2014 average monthly precipitation reported for the CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

Effective precipitation was estimated as 60% of rainfall greater than 0.5 inch per month occurring during the growing season.

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Crop Type	ITRC Representative Crop	2015								Total Growing Season Etc	2015								Effective Precip
		April	May	June	July	August	September	October	April		May	June	July	August	September	October			
		Precipitation	Grass Reference ETo	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)		(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(feet)	
		1.10	0.01	0.00	0.01	0.01	0.03	0.09		1.10	0.01	0.00	0.01	0.01	0.03	0.09	60%		
		6.00	6.79	7.84	7.98	7.06	5.21	3.90											
Alfalfa	Alfalfa Hay and Clover	6.33	5.74	6.73	6.52	6.14	4.38	1.67	3.13	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Almonds	Almonds	4.25	5.48	6.42	6.70	5.73	4.29	2.66	2.96	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Barley	Grain and Grain Hay	6.13	3.07	0.00	0.00	0.00	0.00	0.00	0.77	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Beans	Grain and Grain Hay	6.13	3.07	0.00	0.00	0.00	0.00	0.00	0.77	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Buckwheat	Grain and Grain Hay	6.13	3.07	0.00	0.00	0.00	0.00	0.00	0.77	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Cantelope	Melons, Squash, and Cucumbers	0.00	0.78	1.40	4.46	5.36	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Chestnuts	Almonds	4.25	5.48	6.42	6.70	5.73	4.29	2.66	2.96	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Corn	Corn and Grain Sorghum	2.08	2.23	6.67	7.44	4.88	0.00	0.00	1.94	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Cotton	Cotton	2.00	1.28	4.51	7.79	7.00	4.76	1.30	2.39	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Cover Crop	Pasture and Misc. Grasses	5.25	6.17	7.17	7.22	6.44	4.76	2.75	3.31	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Cucumbers	Melons, Squash, and Cucumbers	0.00	0.78	1.40	4.46	5.36	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Golf course	N/A								3.38	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Grain	Grain and Grain Hay	6.13	3.07	0.00	0.00	0.00	0.00	0.00	0.77	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Grapes	Grape Vines with 80% canopy	2.25	3.01	5.67	5.54	4.67	2.72	0.00	1.99	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Habitat	Citrus (no ground cover)	4.93	4.45	5.15	5.06	4.54	3.44	2.50	2.51	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Habitat	N/A								3.24	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Hay	Grain and Grain Hay	6.13	3.07	0.00	0.00	0.00	0.00	0.00	0.77	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Hops	Small Vegetables	6.02	1.61	0.20	0.00	1.05	1.37	0.71	0.91	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Idle	Idle	1.29	0.10	0.20	0.00	0.02	0.21	0.11	0.16	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Kiwis	N/A								2.92	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Managed Marsh	N/A								2.97	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Melons	Melons, Squash, and Cucumbers	0.00	0.78	1.40	4.46	5.36	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Melons, Squash	Melons, Squash, and Cucumbers	0.00	0.78	1.40	4.46	5.36	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Milo	Corn and Grain Sorghum	2.08	2.23	6.67	7.44	4.88	0.00	0.00	1.94	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Misc. Deciduous	Misc. Deciduous	3.57	5.14	6.50	6.56	5.89	4.12	2.23	2.83	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Misc. field crops	Misc. field crops	2.08	2.28	6.81	7.06	2.61	0.00	0.00	1.74	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Mixed Truck	Small Vegetables	6.02	1.61	0.20	0.00	1.05	1.37	0.71	0.91	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Oats	Grain and Grain Hay	6.13	3.07	0.00	0.00	0.00	0.00	0.00	0.77	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Olives	Avocado	3.57	5.14	6.50	6.56	5.89	4.12	2.23	2.83	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Onions	Onions and Garlic	5.17	4.36	0.85	0.00	0.00	0.00	0.00	0.86	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Pasture	Pasture and Misc. Grasses	5.25	6.17	7.17	7.22	6.44	4.76	2.75	3.31	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Peach	Peach, Nectarine and Apricots	3.45	5.28	6.77	6.80	6.11	4.39	2.11	2.91	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Pears	Apple, Pear, Cherry, Plum and Prune	3.66	5.42	6.78	7.01	6.04	4.38	2.07	2.95	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Pecans	Almonds	4.25	5.48	6.42	6.70	5.73	4.29	2.66	2.96	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Peppers	Tomatoes and Peppers	1.93	3.46	7.63	6.38	0.43	0.00	0.00	1.65	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Persimmons	Apple, Pear, Cherry, Plum and Prune	3.66	5.42	6.78	7.01	6.04	4.38	2.07	2.95	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Prunes	Apple, Pear, Cherry, Plum and Prune	3.66	5.42	6.78	7.01	6.04	4.38	2.07	2.95	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Pumpkins	Melons, Squash, and Cucumbers	0.00	0.78	1.40	4.46	5.36	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Rice	Rice	1.87	6.32	8.72	8.96	7.89	2.42	0.00	3.01	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Rice Straw Decomp	N/A								0.5	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Safflowers	Safflower and Sunflower	5.83	7.16	7.67	1.40	0.00	0.00	0.00	1.84	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Squash	Melons, Squash, and Cucumbers	0.00	0.78	1.40	4.46	5.36	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Strawberries	Strawberries	2.08	2.28	6.81	7.06	2.61	0.00	0.00	1.74	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Sudan	Pasture and Misc. Grasses	5.25	6.17	7.17	7.22	6.44	4.76	2.75	3.31	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Sunflowers	Safflower and Sunflower	5.83	7.16	7.67	1.40	0.00	0.00	0.00	1.84	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Tomatoes	Tomatoes and Peppers	1.93	3.46	7.63	6.38	0.43	0.00	0.00	1.65	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		
Vegetables	Small Vegetables	6.02	1.61	0.20	0.00	1.05	1.37	0.71	0.91	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03		

RDD/122750001 (ET and Eff Precip Tables.xlsx)

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	2015	April	May	June	July	August	September	October	Total Growing Season Etc	April	May	June	July	August	September	October	Effective Precip
		Precipitation	1.10	0.01	0.00	0.01	0.01	0.03		0.09	1.10	0.01	0.00	0.01	0.01	0.03	
	Grass Reference ETo	6.00	6.79	7.84	7.98	7.06	5.21	3.90									60%
Vetch	Pasture and Misc. Grasses	5.25	6.17	7.17	7.22	6.44	4.76	2.75	3.31	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Vinseed	Small Vegetables	6.02	1.61	0.20	0.00	1.05	1.37	0.71	0.91	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Walnuts	Walnuts	2.99	5.09	7.95	7.96	6.99	4.73	2.46	3.18	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Watermelon	Melons, Squash, and Cucumbers	0.00	0.78	1.40	4.46	5.36	1.49	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wheat	Grain and Grain Hay	6.13	3.07	0.00	0.00	0.00	0.00	0.00	0.77	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03

Source: Kc values from *California Crop and Soil Evapotranspiration*, ITRC Report 03-001, January 2003.

Notes:

Crop ET (ETc) was calculated as average ETo for CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235) x Kc based on ITRC Dry Year ETc for Zone 12 surface irrigation for water balances. Crop ET does not include water required for initial flooding, reflooding, or flow through on rice acres.

Precipitation is the 2015 average monthly precipitation reported for the CIMIS Stations at Davis (#6), Colusa (#32) and Verona (#235).

Effective precipitation was estimated as 60% of rainfall greater than 0.5 inch per month occurring during the growing season.

