

**Chowchilla Water District
Water Management Plan
2014 Criteria**

**Date of first draft – (12/15/2015)
Date of second draft – (10/26/2016)**

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Section I: Description of the District

District Name: Chowchilla Water District

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A. History

1. *Date district formed: Feb 7, 1949* *Date of first Reclamation contract: 1939*

Original size (acres): 63,254 *Current year (last complete calendar year): 2013 **

**Due to the drought, the District had a minimal (less than 1,000 AF) water supply in 2014 and 2015. The year 2013 is being used as the last complete year for analysis purposes.*

2. *Current size, population, and irrigated acres*

	(2013)
<i>Size (acres)</i>	85,618
<i>Population served (urban connections)</i>	NA
<i>Irrigated acres</i>	69,275

3. *Water supplies received in current year (2013)*

<i>Water Source</i>	<i>AF</i>
<i>Federal urban water (Tbl 1)</i>	0
<i>Federal agricultural water (Tbl 1)</i>	70,628
<i>State water (Tbl 1)</i>	0
<i>Other Wholesaler (define) (Tbl 1)</i>	0
<i>Local surface water (Tbl 1)</i>	0
<i>Upslope drain water (Tbl 1)</i>	0
<i>District groundwater (Tbl 2)</i>	0
<i>Banked water (Tbl 1)</i>	0
<i>Transferred water (Tbl 1)</i>	1,120
<i>Recycled water (Tbl 3)</i>	0
<i>Other (define) (Tbl 1)</i>	0
<i>Total</i>	71,748

4. *Annual entitlement under each right and/or contract*

	<i>AF</i>	<i>Source</i>	<i>Contract #</i>	<i>Availability period(s)</i>
<i>Reclamation Urban AF/Y</i>	NA			
<i>Reclamation Agriculture AF/Y Class 1</i>	55,000	USBR	175r-2358D	Mar. 1 to Feb. 28
<i>AF/Y Class 2</i>	160,000			

<i>Reclamation Agriculture Buchanan Dam AF/Y</i>	24,000	USBR	14-06-200-3844E	Mar. 1 to Feb. 28
<i>Appropriative AF/Y</i>	50,000	Ash Slough	L8577	Nov. 1 to May 1
<i>Other AF/Y</i>	1,000	LeGrand-Athelone WD	Flood Flows	Surplus years only

5. *Anticipated land-use changes. For Ag contractors, also include changes in irrigated acres.*

The district is anticipating a small amount of agricultural acreage to be developed for housing in the City of Chowchilla. Most of this acreage has already been taken out of agricultural production.

6. *Cropping patterns (Agricultural only)*

List of current crops (crops with 5% or less of total acreage) can be combined in the 'Other' category.

<i>Original Plan (1993)</i>		<i>Previous Plan (2011)</i>		<i>Current Plan (2013)</i>	
<i>Crop Name</i>	<i>Acres</i>	<i>Crop Name</i>	<i>Acres</i>	<i>Crop Name</i>	<i>Acres</i>
Alfalfa	11,900	Alfalfa	13,306	Alfalfa	10,430
Almonds	15,092	Almonds	25,978	Almonds	28,882
Cotton	16,520	Cotton	522	Cotton	871
Corn/Silage	5,771	Corn	10,628	Corn	10,376
Grapes	6,789	Grapes	6,029	Grapes	6,085
Wheat	3,214	Wheat	4,360	Wheat	3,450
		Figs	2,294	Figs	2,062
		Pistachios	2,129	Pistachios	2,624
<i>Other (<5%)</i>	6,602	<i>Other (<5%)</i>	8,707	<i>Other (<5%)</i>	4,495
<i>Total</i>	65,888	<i>Total</i>	73,953	<i>Total</i>	69,275

(See Planner, Chapter 3, Addendum D for list of crop names)

7. *Major irrigation methods (by acreage) (Agricultural only)*

<i>Original Plan (1993)</i>		<i>Previous Plan (2011)</i>		<i>Current Plan (2013)</i>	
<i>Irrigation Method</i>	<i>Acres</i>	<i>Irrigation Method</i>	<i>Acres</i>	<i>Irrigation Method</i>	<i>Acres</i>
Furrow	61,082	Furrow	49,213	Furrow	28,775
Sprinkler		Sprinkler		Sprinkler	3,041
Low-volume	4,763	Low-volume	24,740	Low-volume	36,292
Drip		Drip		Combination	1,167
Microsprinkler		Microsprinkler			
Combination		Combination			
<i>Other</i>		<i>Other</i>		<i>Other</i>	
<i>Total</i>	65,888	<i>Total</i>	73,953	<i>Total</i>	69,275

B. Location and Facilities

See Attachment A for maps containing the following: incoming flow locations, turnouts (internal flow), and outflow (spill) points, conveyance system, storage facilities, operational loss recovery system, district wells and lift pumps, water quality monitoring locations, and groundwater facilities.

1. Incoming flow locations and measurement methods

<i>Location Name</i>	<i>Physical Location</i>	<i>Type of Measurement Device</i>	<i>Accuracy</i>
Madera Canal	Madera Canal Mile 33.6	rated structure	+/- 2 percent
Buchanan Dam	Weir downstream of dam	rated structure	+/- 5 percent
LeGrand-Athelone WD	Serrano Check	water meter	+/- 2 percent

The Madera Canal Mile 33.6 structure is a check structure with a rating curve developed by the Bureau of Reclamation. The weir in the Chowchilla River downstream of Buchanan Dam is a debris shedding v-notch weir with a rating curve developed by the Army Corps of Engineers.

2. Current year Agricultural Conveyance System

<i>Miles Unlined - Canal</i>	<i>Miles Lined - Canal</i>	<i>Miles Piped</i>	<i>Miles – Other Natural Channels</i>
149.3	0.7	49.0	27.5

3. Current year Urban Distribution System

<i>Miles AC Pipe</i>	<i>Miles Steel Pipe</i>	<i>Miles Cast Iron Pipe</i>	<i>Miles - Other</i>

4. Storage facilities (tanks, reservoirs, regulating reservoirs)

<i>Name</i>	<i>Type</i>	<i>Capacity (AF)</i>	<i>Distribution or Spill</i>
Berenda Reservoir	Regulating Reservoir	1,400	Distribution
Califa Pond	Regulating Reservoir	334	Distribution
Dairyland Pond	Regulating Reservoir	76	Distribution
Central Pipeline Pond	Regulating Reservoir	11	Distribution
Berenda Pond	Regulating Reservoir	7	Distribution
Siphon 3 Pond	Regulating Reservoir	37	Distribution
Asken Pond	Regulating Reservoir	7	Distribution
Vera Pond	Regulating Reservoir	42	Distribution
Rutherford Pond	Regulating Reservoir	38	Distribution
Gregory Pond	Regulating Reservoir	12	Distribution
Haynes Pond	Regulating Reservoir	41	Distribution
Townsend Pond	Regulating Reservoir	101	Distribution
Lateral 3 Pond	Regulating Reservoir	85	Distribution
Lateral 4 Pond	Regulating Reservoir	77	Distribution
Road 11 Pond	Regulating Reservoir	28	Distribution

5. Description of the agricultural spill recovery system and outflow points.

Spill from Califa Canal and Dairyland Pipeline is spilled into the Dairyland Pond and pumped back into the Califa Canal and Dairyland Pipeline.

6. *Agricultural delivery system operation (check all that apply)*

<i>Scheduled</i>	<i>Rotation</i>	<i>Other (describe)</i>
X		

7. *Restrictions on water source(s)*

<i>Source</i>	<i>Restriction</i>	<i>Cause of Restriction</i>	<i>Effect on Operations</i>
USBR	Limited water Supply	San Joaquin River Settlement	Increase in groundwater overdraft
USBR	USBR has failed to establish Recirculation Plan that recirculates Restoration Flows to CWD	San Joaquin River Settlement	Increase in groundwater overdraft

8. *Proposed changes or additions to facilities and operations for the next 5 years*

The District will continue to upgrade metered gates to propeller water meters and magnetic induction water meters, construct groundwater recharge basins, construct regulating ponds, install ITRC Flap Gates, expand the SCADA system, construct long-crested weirs, construct broad-crested weirs.

C. Topography and Soils

1. *Topography of the district and its impact on water operations and management*

Land surfaces in the District are relatively flat and slope to the southwest at 8 feet per mile. Elevation is 150 to 325 feet above sea level. Topography does not negatively affect District water management.

2. *District soil association map (Agricultural only)*

See Attachment B, District Soils Map

Soil Association	Estimated Acres	Effect on Water Operations and Management
Pachappa-Grangevilla	56,100	none
San Joaquin-Madera	15,880	none
Fresno-Traver	5,900	none
Fresno-El Peco-Ponzo	1,120	none
Lewis-Landlow-Burchell	1,000	none

3. *Agricultural limitations resulting from soil problems (Agricultural only)*

<i>Soil Problem</i>	<i>Estimated Acres</i>	<i>Effect on Water Operations and Management</i>
Salinity	0	None
High-water table	0	None
High or low infiltration rates	0	None
Other (define)	0	None

D. Climate

1. General climate of the district service area

	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Annual</i>
<i>Avg Precip.</i>	1.98	1.92	1.81	1.08	0.39	0.09	0.01	0.02	0.14	0.58	1.18	1.78	10.99
<i>Avg Temp.</i>	44.9	50.1	54.5	60.1	67.6	74.2	79.8	78.1	73.1	64.0	52.8	45.4	62.1
<i>Max. Temp.</i>	54.0	61.2	67.2	74.8	83.9	91.6	98.2	96.4	90.9	80.3	66.1	55.2	76.6
<i>Min. Temp</i>	35.9	39.1	41.8	45.5	51.3	56.7	61.4	59.9	55.3	47.8	39.6	35.7	47.5
<i>ETo</i>	1.09	1.99	3.75	5.09	7.33	8.29	8.32	7.62	5.59	3.55	1.76	1.07	55.45

Weather station ID Madera 045233 *Data period: Year* 1928 to Year 2012

ET Station ID Madera II 188 *Average annual frost-free days:* 355

Frost Free Days - According to National Oceanic and Atmospheric Administration (NOAA), frost free days are days with temperatures greater than 28 degrees Fahrenheit.

2. Impact of microclimates on water management within the service area. None

E. Natural and Cultural Resources

1. Natural resource areas within the service area

<i>Name</i>	<i>Estimated Acres</i>	<i>Description</i>
Chowchilla River	1,127	31 mile long river
Ash Slough	533	22 mile long river
Berenda Slough	650	22 mile long river

2. Description of district management of these resources in the past or present

District utilizes Chowchilla River, Ash Slough and Berenda Slough for transport of water and groundwater recharge.

3. Recreational and/or cultural resources areas within the service area

<i>Name</i>	<i>Estimated Acres</i>	<i>Description</i>
Berenda Reservoir	140	regulating reservoir/ boating, waterskiing and fishing

F. Operating Rules and Regulations

1. Operating rules and regulations

See Attachment C, District Rules and Regulations (water related)

2. Water allocation policy (Agricultural only)

See Attachment C, Rule 4

Summary - The District's water allocation policy considers factors such as water supply, distribution system capacities, crop water demands and maximization of delivery efficiencies. The policy is described in Attachment C, Rule 4, Rules and Regulations Governing Water Delivery.

3. Official and actual lead times necessary for water orders and shut-off (Agricultural only)

See Attachment C, Rule 6

Summary –Requests for water orders and shutoffs must be received by 1:00 pm, for the following day. Actual lead times may vary depending on when on requests and off requests are received, most can be accommodated when requested

4. Policies regarding return flows (surface and subsurface drainage from farms) and outflow (Agricultural only)

See Attachment C, Rule 13

Summary – Surface drainage into the canal system is only allowed during the non-water delivery season. There is no subsurface drainage in the District.

5. Policies on water transfers by the district and its customers

The District does not have a written water transfer policy.

Summary – The District can exercise the option to transfer water to other CVP contractors pursuant to current contract provisions. In-district and out of district transfers by water users are not allowed.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers

Refer to BMP A.1. Information on water measurement for agricultural contractors is completed under BMP A.1 on page 4-15.

2. Urban Customers

- a. Total number of connections _____ 0 _____
- b. Total number of metered connections _____ 0 _____
- c. Total number of connections not billed by quantity _____ 0 _____
- d. Percentage of water that was measured at delivery point _____ 0 _____
- e. Percentage of delivered water that was billed by quantity _____ 0 _____
- f. Measurement device table (notapplicable)

Meter Size and Type	Number	Accuracy* (+/-percentage)	Reading Frequency	Calibration Frequency	Maintenance Frequency
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			<i>(Days)</i>	<i>(Months)</i>	<i>(Months)</i>
5/8-3/4"					
1"					
1 1/2"					
2"					
3"					
4"					
6"					
8"					
10"					
Compound					
Turbo					
Other (define)					
Total					

*Documentation verifying the accuracy of measurement devices must be submitted with Plan and included as Attachment D.

3. *Agricultural and Urban Rates*

a. *Current year agricultural and /or urban water charges - including rate structures and billing frequency*

See Attachment E, Page (1), for current year rate ordinance (2013)

b. *Annual charges collected from agricultural customers*

<i>Fixed Charges</i>			
<i>Charges (\$ by unit)</i>	<i>Charge units \$/acre, etc.</i>	<i>Units billed during year acres, etc.</i>	<i>Total \$ collected (\$ times units)</i>
\$1.50/\$100	\$ assessed value	\$132,911,200 assessed value	\$1,993,668
\$16	\$/acre	76,402 acres	\$1,222,439
\$22	\$/acre	76,402 acres	\$1,680,853

Please refer to the guidebook for information when completing the table.

<i>Volumetric charges</i>			
<i>Charges (\$ by unit)</i>	<i>Charge units \$/AF, etc.</i>	<i>Units billed during year AF, etc.</i>	<i>Total \$ collected (\$ times units)</i>
\$55	\$/AF	51,070 AF	\$2,808,850
\$250	\$/AF	439 AF	\$109,750
\$275	\$/AF	610 AF	\$167,750
\$27.50	\$/AF	11 AF	\$303
\$415	\$/AF	125 AF	\$51,875

Please refer to the guidebook for information when completing the table.

Annual charges collected from urban customers

<i>Fixed Charges</i>			
<i>Charges (\$ by unit)</i>	<i>Charge units (\$/meter size)</i>	<i>Units billed during year (by meter size) etc.</i>	<i>Total \$ collected (\$ times units)</i>
NA			

Please refer to the guidebook for information when completing the table.

<i>Volumetric charges</i>			
<i>Charges (\$ by unit)</i>	<i>Charge units (\$/HCF), etc.</i>	<i>Units billed during year HCF, Kgal, etc.</i>	<i>Total \$ collected (\$ times units)</i>
NA			

Please refer to the guidebook for information when completing the table.

See Attachment F, Page 1, District Sample Bills

c. Describe the contractor's record management system

The District utilizes a water accounting program called STORM. Ditchtenders enter water measurement data and start and stop times into a handheld device (iPod or iPhone) and the water measurement data is then downloaded into the District's computer server. Storm calculates the volume of water delivered daily, based on the length of time and the instantaneous flow measurements. Water users receive a monthly statement of volumetric water use by delivery turnout. Waterusers can also access their water delivery data by logging on to the District's web site www.cwdwater.com. Land based District assessments are also maintained in STORM.

H. Water Shortage Allocation Policies

1. Current year water shortage policies or shortage response plan - specifying how reduced water supplies are allocated

Water supply forecasts are reviewed to determine the date when District water deliveries begin. Determination of a beginning date takes into account crop water demands and maximization of delivery efficiencies. If forecasts indicate water will be available throughout the year, deliveries are scheduled to begin on or about the first of March and continue until late fall. When forecasts indicate water will not be available throughout the year, the period of mid-June thru mid-August is given priority when scheduling water for delivery. When in the opinion of the District, water demands exceed the design or actual capacity of the distribution system or the supply of water, the district reserves the right to rotate the use of water by basic time and quantity method in order to deliver approximately equal amounts of water in acre-feet per acre. Waterusers rely on their private deep wells to irrigate crops when District water is not available.

See Attachment G, page 1, District Water Shortage Plan

2. *Current year policies that address wasteful use of water and enforcement methods*
See Attachment C, District Rules and Regulations, Rule 7 Waste of Water

I. Evaluate Policies of Regulatory Agencies Affecting the Contractor and Identify Policies that Inhibit Good Water Management.

Discuss possible modifications to policies and solutions for improved water management.

There are no regulatory policies affecting good water management in the District.

Section II: Inventory of Water Resources

A. Surface Water Supply

1. *Surface water supplies in acre feet, imported and originating within the service area, by month (Table 1).*

See Chapter 5, Water Inventory Tables, Table 1

2. *Amount of water delivered to the district by each of the district sources for the last 10 years*

See Chapter 5, Water Inventory Tables, Table 8.

B. Groundwater Supply

1. *Groundwater extracted by the district and delivered, by month (Table 2)*

See Chapter 5, Water Inventory Tables, Table 2

2. *Groundwater basin(s) that underlies the service area*

<i>Name</i>	<i>Size (Square Miles)</i>	<i>Usable Capacity (AF)</i>	<i>Safe Yield (AF/Y)</i>
Chowchilla Groundwater Basin	250	NA	18,000

3. *Map of district-operated wells and managed groundwater recharge areas*

The District has no district operated wells to recover groundwater. Attachment A shows the District's canals, streams and, regulating ponds that are used to recharge the groundwater.

See Attachment A, for District Map of Groundwater Facilities

4. *Description of conjunctive use of surface and groundwater
(Please review Guidebook definition of conjunctive use)*

Water users in Chowchilla Water District utilize both surface water and groundwater conjunctively. The District's irrigation conveyance system consists of natural river channels and unlined canals and is a major means of groundwater recharge utilizing the water supplies available (Madera Canal and Buchanan Dam) to the District. The District's conjunctive use program is described in detail in the Madera Regional Groundwater Management Plan. The characteristics of the groundwater basin (available storage, storage capacity, specific yield, hydraulic continuity, etc.) have not been adequately determined. More analysis is needed and will be completed in the Groundwater Sustainability Plan that will be prepared by the stakeholders in the Chowchilla Groundwater Basin in order to comply with the Sustainable Groundwater Management Act. There are no known groundwater quality problems in the District. The District assessments and water charges are the source of income for the purchase of surface water that is used for groundwater recharge.

5. *Groundwater Management Plan*

See Attachment H, Groundwater Management Plan

6. *Groundwater Banking Plan*

See Attachment I, Groundwater Banking Plan

C. Other Water Supplies

1. "Other" water used as part of the water supply – Describe supply
See Chapter 5, Water Inventory Tables, Table 1

D. Source Water Quality Monitoring Practices

1. Potable Water Quality (Urban only)
See Attachment – District Annual Potable Water Quality Report

NA

2. Agricultural water quality concerns: Yes _____ No X
(If yes, describe)

3. Description of the agricultural water quality testing program and the role of each participant, including the district, in the program

The District does not have an agricultural water quality testing program. There are no known problems associated with use of surface water or groundwater for irrigation of agricultural crops in the District. Water quality analysis of the water delivered from the Madera Canal is performed annually by the Friant Water Authority. A copy of the analysis performed is included in Attachment J.

4. Current water quality monitoring programs for surface water by source (Agricultural only)

<i>Analyses Performed</i>	<i>Frequency</i>	<i>Concentration Range</i>	<i>Average</i>
None			

Current water quality monitoring programs for groundwater by source (Agricultural only)

<i>Analyses Performed</i>	<i>Frequency</i>	<i>Concentration Range</i>	<i>Average</i>
None			

E. Water Uses within the District

1. Agricultural
See Chapter 5, Water Inventory Tables, Table 5 - Crop Water Needs

2. Types of irrigation systems used for each crop in current year

<i>Crop name</i>	<i>Total Acres</i>	<i>Level Basin – acres</i>	<i>Furrow - acres</i>	<i>Sprinkler – acres</i>	<i>Low Volume - acres</i>	<i>Multiple methods - acres</i>
Alfalfa	10430	0	8075	811	1544	0
Almonds	28882	0	2951	94	25836	0
Cotton	871	0	809	62	0	0

Corn	10376	0	10163	0	213	0
Grapes	6085	0	621	0	4762	702
Wheat	3450	0	2873	0	308	269
Figs	2062	0	0	0	2062	0
Pistachios	2624	0	90	1816	718	0
Other	4495	0	3193	257	849	196
TOTAL	69275	0	28775	3041	36292	1167

3. Urban use by customer type in current year

<i>Customer Type</i>	<i>Number of Connections</i>	<i>AF</i>
<i>Single-family</i>	NA	
<i>Multi-family</i>		
<i>Commercial</i>		
<i>Industrial</i>		
<i>Institutional</i>		
<i>Landscape irrigation</i>		
<i>Wholesale</i>		
<i>Recycled</i>		
<i>Other (specify)</i>		
<i>Other (specify)</i>		
<i>Other (specify)</i>		
<i>Unaccounted for</i>		
Total		

4. Urban Wastewater Collection/Treatment Systems serving the service area

<i>Treatment Plant</i>	<i>Treatment Level (1, 2, 3)</i>	<i>AF</i>	<i>Disposal to / uses</i>
NA			
	Total	0	
Total discharged to ocean and/or saline sink			

5. Groundwater recharge in current year (Table 6)

<i>Recharge Area</i>	<i>Method of Recharge</i>	<i>AF</i>	<i>Method of Retrieval</i>
	Total	0	

6a. Transfers and exchanges **into** the service area in current year – (Table 1)

<i>From Whom</i>	<i>To Whom</i>	<i>AF</i>	<i>Use</i>
------------------	----------------	-----------	------------

Lindsay Strathmore ID	Chowchilla WD	1,000	ag irrigation
Madera ID	Chowchilla WD	120	ag irrigation
	Total	1,120	

6b. Transfers and exchanges *out* of the service area in current year – (Table 6)

<i>From Whom</i>	<i>To Whom</i>	<i>AF</i>	<i>Use</i>
Chowchilla WD	Madera ID	392	ag irrigation
Chowchilla WD	Riparian Water Rights	485	ag irrigation
	Total	877	

7. Wheeling, or other transactions in and out of the district boundaries – (Table 6)

<i>From Whom</i>	<i>To Whom</i>	<i>AF</i>	<i>Use</i>
NA			
	Total		

8. Other uses of water

<i>Other Uses</i>	<i>AF</i>
NA	

F. Outflow from the District (Agricultural only)

See Facilities Map, Attachment A, for the location of surface and subsurface outflow points, outflow measurement points, outflow water-quality testing locations

1. Surface and subsurface drain/outflow

<i>Outflow point</i>	<i>Location description</i>	<i>AF</i>	<i>Type of measurement</i>	<i>Accuracy (%)</i>	<i>% of total outflow</i>	<i>Acres drained</i>
1	Justin Lateral Spill	4	weir	+5%	4	canal
2	Justin Canal Spill	24	weir	+5%	22	canal
3	Ashview Lateral B Spill	33	weir	+5%	30	canal
4	La Branza Lateral 2 Spill	0	weir	+5%	0	canal
5	La Branza Lateral 2A Spill	0	weir	+5%	0	canal
6	La Branza Lateral 3 Spill	0	weir	+5%	0	canal
7	La Branza Lateral 4 Spill	3	weir	+5%	3	canal
8	Hughes Lateral B Spill	15	weir	+5%	14	canal
9	Hughes Canal Spill	19	weir	+5%	18	canal
10	Berenda Canal Spill	10	weir	+5%	9	canal
11	Dairyland Pond Spill	0	weir	+5%	0	canal

<i>Outflow point</i>	<i>Where the outflow goes (drain, river or other location)</i>	<i>Type Reuse (if known)</i>
1	Chowchilla Canal	ag irrigation
2	Chowchilla River	ag irrigation
3	Ash Slough	ag irrigation
4	Chowchilla River	ag irrigation
5	Chowchilla River	ag irrigation
6	El Nido Canal	ag irrigation
7	El Nido Canal	ag irrigation
8	Chowchilla Canal	ag irrigation
9	Chowchilla Canal	ag irrigation
10	Berenda Slough	ag irrigation
11	Berenda Slough	ag irrigation

2. *Description of the Outflow (surface and subsurface) water quality testing program and the role of each participant in the program*

None. The District does not have a water quality testing program for water that is spilled from the District's irrigation delivery system. There are no known problems associated with use of CWD surface water spilled and used for irrigation of agricultural crops.

3. *Outflow (surface drainage & spill) Quality Testing Program*

<i>Analyses Performed</i>	<i>Frequency</i>	<i>Concentration Range</i>	<i>Average</i>	<i>Reuse limitation?</i>
None				

Outflow (subsurface drainage) Quality Testing Program

<i>Analyses Performed</i>	<i>Frequency</i>	<i>Concentration Range</i>	<i>Average</i>	<i>Reuse limitation?</i>
NA				

4. Provide a brief discussion of the District's involvement in Central Valley Regional Water Quality Control Board programs or requirements for remediating or monitoring any contaminants that would significantly degrade water quality in the receiving surface waters.

Not applicable. The District does not have a water quality testing program for water that is discharged into the sloughs from the District's surface irrigation delivery system. There are no known problems associated with use of surface water discharged from the District's canals into the sloughs and used for irrigation of agricultural crops or recharged into the groundwater.

Districts included in the drainage problem area, as identified in "A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley (September 1990)," should also complete Water Inventory Table 7 and Addendum C (include in plan as Attachment J)

G. Water Accounting (Inventory)

Go To Chapter 5 for Agricultural Water Inventory Tables and Instructions.

Go To Chapter 6 for Urban Water Inventory Tables and Instructions.

Section III: Best Management Practices (BMPs) for Agricultural Contractors

A. Critical Agricultural BMPs

1. Measure the volume of water delivered by the district to each turnout with devices that are operated and maintained to a reasonable degree of accuracy, under most conditions, to +/- 6%

- a. Number of delivery points (turnouts and connections) 746
- b. Number of delivery points serving more than one farm 0
- c. Number of measured delivery points (meters and measurement devices) 746
- d. Percentage of water delivered to the contractor that was measured at a delivery point 100 %
- e. Total number of delivery points not billed by quantity 0
- f. Delivery point measurement device table

Measurement Type	Number	Accuracy* (+/- %)	Reading Frequency (Days)	Calibration Frequency (Months)	Maintenance Frequency (Months)
Orifices					
Propeller meter		2%	1 to 2 daily	as required**	12
Weirs		5%	1 to 2 daily	as required**	12
Flumes					
Venturi					
Metered gates		6%	1 to 2 daily	as required**	12
Acoustic doppler					
Other (magnetic Induction)		2%	1 to 2 daily	as required**	12
Total					

* Documentation verifying the accuracy of measurement devices must be submitted with Plan and included in Attachment D.

** The District is currently verifying the accuracy of all District measurement devices and determining the frequency that they should be calibrated. The SBx7-7 Supplement Report is included in Attachment D.

2. Designate a water conservation coordinator to develop and implement the Plan and develop progress reports

Name: Douglas Welch Title: General Resources Manager

Address: 327 S. Chowchilla Blvd. Chowchilla, CA 93610

Telephone: 559-665-3747 E-mail: dwelch@cwdwater.com

Provide the job description and minimum qualifications

General Resources Manager
Job Description

A. Primary Function: Full time position as General Resources Manager with the Chowchilla Water District located in Chowchilla, California. Under the administrative direction of the Chowchilla Water District, Board of Directors, represent the Board's interests with State, Federal and local agencies and coordinate the work of consultants relating to the District's Contract with the United States and other agencies or individuals.

B. Typical Duties :

1. Effectively communicate and coordinate the outside activities of the District;
2. Investigate various strategies, programs and physical solutions to protect and enhance the surface water and groundwater resources of the District;
3. Represent the District at meetings with State, Federal and local agencies, including but not limited to appropriate ground water forums, AB3030, MAGPIE, San Joaquin River Restoration discussions, Friant Power Authority, Friant Water Authority, Merced and Madera IRWMP's, and any other pertinent meetings. Make a monthly report to the Board on said meetings, and coordinate with the District's Board of Directors concerning the effect on District operations and policies;
4. Negotiate issues pertaining to CWD's water service and/or applicable contracts;
5. Attend meetings related to Chowchilla Water District business, report on those activities, and train a back-up person to attend such meetings;
6. Coordinate and administer the work of various consultants in conjunction with the General Operations Manager and the District's Board of Directors;
7. Negotiate wholesale water transfer and exchange agreements with other public agencies;
8. Provide business, technical and managerial input to the General Operations Manager as requested;
9. Prepare and perform presentations at the Board of Directors' meetings and other public forums as necessary or requested;
10. Prepare and submit annual crop reports to the California Department of Water Resources;
11. Coordinate with and assist the General Operations Manager in the performance of his duties as requested;
12. Prepare and submit annual and five year Water Management Plan updates to the U.S. Bureau of Reclamation;
13. Prepare and submit comments on Environmental Impact Reports prepared by the City of Chowchilla, Madera County and Merced County for projects that have an impact on the Chowchilla Water District's water delivery system and water resources;
14. Oversee and manage the program developed by the District to implement and satisfy the prescriptive, riparian and appropriative water rights on the Chowchilla River System;
15. Perform duties as the General Manager of the Madera —Chowchilla Water and Power Authority;
16. Perform duties as the Manager for the City of Chowchilla, Red-Top Conservation District, and CWD Joint Powers Authority (JPA);
17. Prepare reports for the District on a regular basis as directed by the District's Board of Directors;
18. Perform other work as required or assigned.

3. *Provide or support the availability of water management services to water users*

See Attachment K, Notices of District Education Programs and Services Available to Customers.

a. On-Farm Evaluations

- 1) On farm irrigation and drainage system evaluations using a mobile lab type assessment

The District annually notifies all waterusers in the District of the on-farm irrigation evaluation program that the District co-sponsors with the Irrigation Training Research Center.

	<i>Total in district</i>	<i># surveyed last year</i>	<i># surveyed in current year</i>	<i># projected for next year</i>	<i># projected 2nd yr in future</i>
<i>Irrigated acres</i>	75,183	125	177	200	200
<i>Number of farms</i>	235	3	2	2-3	2-3

2) Timely field and crop-specific water delivery information to the water user

The District utilizes a water accounting program called STORM. Ditchtenders enter water measurement data into a handheld device (iPod or iPhone) and the water measurement data is then downloaded into the District's computer server at the end of the day. Water users receive a monthly statement of water use by delivery turnout. Waterusers can also access their water delivery data by logging on to the District's web site www.cwdwater.com. District delivery turnouts typically serve multiple fields and crops. It is not possible for the District to segregate crop-specific water delivery information. Waterusers can segregate water use by crop if they keep appropriate records.

b. Real-time and normal irrigation scheduling and crop ET information

The District provides links on its web site to the Irrigation and Training Research Center, CIMIS, and Center for Irrigation Technology.

c. Surface, ground, and drainage water quantity and quality data provided to water users

The District does not have a water quality testing program. There are no known problems associated with use of surface water and groundwater in the District. Attachment J shows the water quality testing from the Madera Canal.

d. Agricultural water management educational programs and materials for farmers, staff, and the public

<i>Program</i>	<i>Co-Funders (If Any)</i>	<i>Yearly Targets</i>
Grower Information Meetings	County Ag Department	100 participants
ITRC irrigation evaluations	USBR	10 to 15 farms
CIT Fresno Seminar Series	Center for Irrigation Technology	100 participants

See Attachment K for samples of provided materials and notices

e. Other

4. Pricing structure - based at least in part on quantity delivered

Adopt a water pricing structure based on the measured quantity delivered

The District has charged Waterusers for water on a per acre-foot basis since the creation of the District in 1949. The water rate is set based on the melded rate of the various water supplies to the District. Attachment E shows the water rates in 2013. The water rates in 2014 and 2015 were respectively \$615 and \$800 per AF respectively.

5. Evaluate and improve efficiencies of district pumps

Describe the program to evaluate and improve the efficiencies of the contractor's pumps.

	<i>Total in district</i>	<i># surveyed last year</i>	<i># surveyed in current year</i>	<i># projected for next year</i>
<i>Wells</i>	0	0	0	0
<i>Lift pumps</i>	12	0	0	2

** The only water delivered in the District in 2014 and 2015 was to subordinate lands served directly from the Madera Canal. There was no water delivered thru the District's distribution system, so there was no way to test any of the District's lift pumps.

B. Exemptible BMPs for Agricultural Contractors

(See Planner, Chapter 2, Addendum B for examples of exemptible conditions)

1. Facilitate alternative land use

<i>Drainage Characteristic</i>	<i>Acreage</i>	<i>Potential Alternate Uses</i>
<i>High water table (<5 feet)</i>	0	
<i>Poor drainage</i>	0	
<i>Groundwater Selenium concentration > 50 ppb</i>	0	
<i>Poor productivity</i>	0	

Describe how the contractor encourages customers to participate in these programs.

2. Facilitate use of available recycled urban wastewater

<i>Sources of Recycled Urban Waste Water</i>	<i>AF/Y Available</i>	<i>AF/Y Currently Used in District</i>
None**		

** There is no urban recycled waste water available to the District.

3. Facilitate the financing of capital improvements for on-farm irrigation systems

<i>Program</i>	<i>Description</i>
NRCS	District refers waterusers to Madera County NRCS for design and cost-sharing on conservation practices.
District	The District cost-shares 25% of the cost of a water meter to replace meter gate measurements. The District installs the meter at no cost and maintains the meter forever.

4. Incentive pricing

Describe incentive rate structure or other programs and purpose.

The District is a conjunctive use District. Free or reduced price water is made available to waterusers in wet years during the winter and spring to encourage use of surface water for groundwater recharge and in-lieu recharge.

5. a) *Line or pipe ditches and canals*

NA – Waterusers in Chowchilla Water District utilize both surface water and groundwater conjunctively. The District’s canal system is mostly unlined and is a major means of groundwater recharge. A 0.7 mile section of canal was concrete lined in 2007 adjacent to a future urban development area.

<i>Canal/Lateral (Reach)</i>	<i>Type of Improvement</i>	<i>Number of Miles in Reach</i>	<i>Estimated Seepage (AF/Y)</i>	<i>Accomplished/Planned Date</i>
Main Canal	concrete line	0.2 miles	13	2007
Berenda Canal	concrete line	0.5 miles	22	2007

The canals that have been concrete lined “Accomplished” are listed. They were installed by a developer adjacent to property that is scheduled for development in the near future. The purpose for the concrete lining was to reduce the risk of canal breaks and the subsequent residential flood damage that could possibly occur. No additional concrete lining is planned until additional housing developments occur adjacent to earth unlined District canals.

b) *Construct/line regulatory reservoirs*

The District has constructed numerous regulating reservoirs and continues to investigate locations that would improve the efficiency of the District and provide more flexible and consistent deliveries. The reduction in spill and improved on-farm irrigation efficiency that has resulted from the construction of the regulating reservoirs is not known. See listing of regulating reservoirs in Section B - Location and Facilities

The District continues to investigate locations that would improve the efficiency of the District and provide more flexible and consistent deliveries. No additional locations for construction of a regulatory reservoir have been identified at this time.

<i>Reservoir Name</i>	<i>Location</i>	<i>Describe improved operational flexibility and AF savings</i>
Berenda Reservoir	Berenda S.	reregulating reservoir
Califa Pond	Califa C.	reregulating reservoir
Dairyland Pond	Berenda S.	reregulating reservoir
Central PL Pond	Berenda C.	reregulating reservoir
Berenda Pond	Berenda C.	reregulating reservoir
Siphon 3 Pond	Ash Slough	reregulating reservoir
Asken Pond	Ashview A.	reregulating reservoir
Vera Pond	Ashview C.	reregulating reservoir
Rutherford Pond	Hughes C.	reregulating reservoir
Gregory Pond	Ashview C.	reregulating reservoir
Haynes Pond	Berenda C.	reregulating reservoir

Townsend Pond	Bethel A.	reregulating reservoir
Lateral 3 Pond	Lateral 3	reregulating reservoir
Lateral 4 Pond	Lateral 4	reregulating reservoir
Road 11 Pond	Ash Main C	reregulating reservoir

6. Increase flexibility in water ordering by, and delivery to, water users
See Attachment L, contractor 'agricultural water order' form

The District takes water orders over the phone which are entered directly into STORM (water accounting program) or waterusers can place a water order by accessing the District's web site www.cwdwater.com.

The District has a scheduled demand irrigation delivery system. Waterusers order water before 1:00 pm and receive it on the following day for the period of time requested. Waterusers notify the District of shutoff times before 1:00 pm and then shut off at the requested time on next day. Flexibility in start time and shutoff time are explained in detail in Rule 6 of Rules & Regulations. During periods of high demand some customers may experience short delays (usually less than 4 hours) in receiving water. The flexibility offered at this time is more than adequate to result in very high on-farm irrigation efficiencies.

7. Construct and operate district spill and tailwater recovery systems

Drainage of tailwater into the District canal system is not permitted during the water delivery season. All tailwater must be contained on farm.

<i>Distribution System Lateral</i>	<i>Annual Spill (AF/Y)</i>	<i>Quantity Recovered and reused (AF/Y)</i>
Dairyland Pipeline	85	75
Califa Canal	85	75
Total	170	150

<i>Drainage System Lateral</i>	<i>Annual Drainage Outflow (AF/Y)</i>	<i>Quantity Recovered and reused (AF/Y)</i>
None		
Total		

Describe facilities that resulted in reduced spill and tailwater.

Spill from the Dairyland Pipeline and the Califa Canal discharge into the Dairyland Pond. The spill water is pumped back into the Dairyland Pipeline and the Califa Canal for delivery to farms.

Rectangular weirs and water level recorders were installed at the 10 locations where water is spilled from the District. The District has installed a SCADA system (31 sites) which allows better control of water in the District. Two parshall flumes, 13 broad-crested weirs, 4 cipollette weirs and 10 rectangular

weirs have been installed in the District to accurately measure water flows at canal headings and key locations in the District's irrigation delivery system. Twenty-one long-crested weirs and 103 ITRC flap gates have been installed in the District's irrigation delivery system to control water levels upstream of check structures. Installment of these improvements has resulted in a reduction of spill. Spill outside of the District was less than 0.2 percent (108 acre-feet) in 2013.

The District has spent millions of dollars improving the District's irrigation delivery system over the past 30 years. Canal spill has been reduced from over 10% to less than 0.5%. In 2013 the District received 71,356 AF and spilled 108 AF. The cost to reduce spill more than this is not cost effective. The water spilled by the District is recovered by downstream waterusers for irrigation of their crops, which reduces the amount of groundwater that they pump. These waterusers are pumping water out of the same groundwater basin (Chowchilla Subbasin) as CWD.

8. *Plan to measure outflow.*

Total # of outflow (surface) locations/points 11

Total # of outflow (subsurface) locations/points 0

Total # of measured outflow points 11

Percentage of total outflow (volume) measured during report year 100%

Identify locations, prioritize, determine best measurement method/cost, submit funding proposal

Location & Priority	Estimated cost (in \$1,000s)				
	Year 1	Year 2	Year 3	Year 4	Year 5
all surface outflow is measured					

9. *Optimize conjunctive use of surface and groundwater*

Describe the potential for increasing conjunctive use of surface and groundwater.

The District will continue its program of providing surface water at reduced pricing during wet years to promote in-lieu groundwater recharge. The District has purchased 55 acres for the construction of a groundwater recharge basin (Road 13 Pond). Construction of the \$660,000 groundwater recharge pond is scheduled for 2017. This project is included in the Madera Canal Capacity Restoration Project. The average annual groundwater recharge for this pond is estimated to be 2,819 acre-feet. Additional sites for construction of groundwater recharge basins will be identified and as funding becomes available they will be constructed.

10. *Automate distribution and/or drainage system structures*

Identify locations where automation would increase delivery flexibility and reduce spill and losses. Describe program to achieve these benefits and estimate the annual water savings.

The District has identified 18 additional locations for installation of SCADA that would improve automation of the District's irrigation delivery system. These sites were identified in the Madera Canal

Capacity Restoration Feasibility Study. Funding (\$1,900,000) of these projects through the Madera Canal Capacity Restoration Project is scheduled to occur in 2017. The average increase in annual on-farm deliveries due to system improvements is estimated to range from 7,217 AF to 10,377 AF. Below is the list of new SCADA site locations.

La Branza Main Canal Heading
 Ashview Lateral B Heading
 Califa Boyd Lateral Drop 1 and Drop 5
 Califa Lateral B Heading
 Califa Lateral C Heading
 Califa Lateral D Heading
 Justin Lateral Heading
 Berenda Canal Drop 12
 Ashview Lateral B Spill
 Berenda Canal Drop 28
 Califa Canal Drop 22
 Califa Lateral B Drop 15
 Califa Lateral C Drop 10
 Califa Lateral D Drop 10
 Bethel Canal Drop 9
 Justin Lateral Spill Drop 17
 Tarabini PL 1st Centerline Gate
 Road 13 Ponding Basin

11. Facilitate or promote water customer pump testing and evaluation

See Attachment H, Notices of District Education Programs and Services Available to Customers

12. Mapping

<i>GIS maps</i>	<i>Estimated cost (in \$1,000s)</i>				
	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 5</i>	<i>Year 6</i>
<i>Layer 1 – Distribution system</i>	1,000				
<i>Layer 2 – Drainage system</i>					
<i>Suggested layers:</i>					
<i>Layer 3 – Groundwater information</i>		1,000			
<i>Layer 4 – Soils map</i>			1,000		
<i>Layer 5 – Natural & cultural resources</i>				1,000	
<i>Layer 6 – Problem areas</i>					

The District's Geographical Information System (GIS) currently has layers for the District's distribution system with canals, pipelines, regulating ponds, turnouts, lift pumps, spills, and SCADA sites. The District does not have a drainage system. The District is currently adding CASGEM wells that are monitored by the District.

C. Provide a 5-Year Budget for Implementing BMPs

1. Amount actually spent during current year.

Year <u>2015</u> or Year <u>1</u>		Actual Expenditure	
BMP #	BMP Name	(not including staff time)	Staff Hours
A 1	Measurement	\$180,000	600
2	Conservation staff	\$1,000	10
3	On-farm evaluation /water delivery info	\$100	8
	Irrigation Scheduling	\$100	8
	Water quality	\$0	1
	Agricultural Education Program	\$100	8
4	Quantity pricing	\$100	1
5	Contractor's pumps	\$0	0
B 1	Alternative land use	\$0	0
2	Urban recycled water use	\$0	0
3	Financing of on-farm improvements	\$0	8
4	Incentive pricing	\$0	8
5	Line or pipe canals/install reservoirs	\$0	10
6	Increase delivery flexibility	\$400	8
7	District spill/tailwater recovery systems	\$0	8
8	Measure outflow	\$0	0
9	Optimize conjunctive use	\$0	8
10	Automate canal structures	\$0	20
11	Customer pump testing	\$0	8
12	Mapping	\$1,000	8
Total		\$182,800	722

2. Projected budget summary for the next year.

Year <u>2016</u> or Year <u>2</u>		Budgeted Expenditure	
BMP #	BMP Name	(not including staff time)	Staff Hours
A 1	Measurement	\$100,000	300
2	Conservation staff	\$1,000	10
3	On-farm evaluations/water delivery info	\$100	8
	Irrigation Scheduling	\$100	8
	Water quality	\$0	1
	Agricultural Education Program	\$100	8
4	Quantity pricing	\$100	1
5	Contractor's pumps	\$300	3
B 1	Alternative land use	\$0	0
2	Urban recycled water use	\$0	0
3	Financing of on-farm improvements	\$0	8
4	Incentive pricing	\$0	8
5	Line or pipe canals/install reservoirs	\$0	10
6	Increase delivery flexibility	\$400	8
7	District spill/tailwater recovery systems	\$0	8
8	Measure outflow	\$100	720
9	Optimize conjunctive use	\$0	8
10	Automate canal structures	\$0	40
11	Customer pump testing	\$0	8

12 Mapping	\$1,000	8
<i>Total</i>	<i>\$103,200</i>	<i>1,165</i>

3. Projected budget summary for 3rd year.

Year <u>2017</u> or <u>Year 3</u>		Budgeted Expenditure (not including staff time)	Staff Hours
BMP #	BMP Name		
A 1	Measurement	\$50,000	100
2	Conservation staff	\$0	10
3	On-farm evaluations/water delivery info	\$100	8
	Irrigation Scheduling	\$100	8
	Water quality	\$0	1
	Agricultural Education Program	\$100	8
4	Quantity pricing	\$100	1
5	Contractor's pumps	\$300	3
B 1	Alternative land use	\$0	0
2	Urban recycled water use	\$0	0
3	Financing of on-farm improvements	\$0	8
4	Incentive pricing	\$0	8
5	Line or pipe canals/install reservoirs	\$600,000	8
6	Increase delivery flexibility	\$400	8
7	District spill/tailwater recovery systems	\$0	8
8	Measure outflow	\$100	720
9	Optimize conjunctive use	\$0	8
10	Automate canal structures	\$2,041,000	320
11	Customer pump testing	\$0	8
12	Mapping	\$1,000	8
<i>Total</i>		<i>\$2,693,200</i>	<i>1,223</i>

4. Projected budget summary for 4th year.

Year <u>2018</u> or <u>Year 4</u>		Budgeted Expenditure (not including staff time)	Staff Hours
BMP #	BMP Name		
A 1	Measurement	\$50,000	100
2	Conservation staff	\$0	10
3	On-farm evaluations/water delivery info	\$100	8
	Irrigation Scheduling	\$100	8
	Water quality	\$0	1
	Agricultural Education Program	\$100	8
4	Quantity pricing	\$100	1
5	Contractor's pumps	\$300	3
B 1	Alternative land use	\$0	0
2	Urban recycled water use	\$0	0
3	Financing of on-farm improvements	\$0	8
4	Incentive pricing	\$0	8
5	Line or pipe canals/install reservoirs	\$0	8
6	Increase delivery flexibility	\$400	8
7	District spill/tailwater recovery systems	\$0	8

8	Measure outflow	\$100	720
9	Optimize conjunctive use	\$0	8
10	Automate canal structures	\$3,000	40
11	Customer pump testing	\$0	8
12	Mapping	\$1,000	8
<i>Total</i>		\$55,200	963

5. Projected budget summary for 5th year.

Year 2019 or Year 5		Budgeted Expenditure	Staff Hours
BMP #	BMP Name	(not including staff time)	
A 1	Measurement	\$20,000	40
2	Conservation staff	\$0	10
3	On-farm evaluations/water delivery info	\$100	8
	Irrigation Scheduling	\$100	8
	Water quality	\$0	1
	Agricultural Education Program	\$100	8
4	Quantity pricing	\$100	1
5	Contractor's pumps	\$300	3
B 1	Alternative land use	\$0	0
2	Urban recycled water use	\$0	0
3	Financing of on-farm improvements	\$0	8
4	Incentive pricing	\$0	8
5	Line or pipe canals/install reservoirs	\$0	8
6	Increase delivery flexibility	\$400	8
7	District spill/tailwater recovery systems	\$0	8
8	Measure outflow	\$100	720
9	Optimize conjunctive use	\$0	8
10	Automate canal structures	\$3,000	40
11	Customer pump testing	\$0	8
12	Mapping	\$0	0
<i>Total</i>		\$24,200	895

Section IV: Best Management Practices for Urban Contractors

Not applicable

Section V: District Water Inventory Tables

Year of Data

[Enter data year here](#)

Table 1

Surface Water Supply

2013 Month	Method	Federal		Federal non-		State Water		Local Water		Other		Transfers into		Upslope		Total
		Ag Water (acre-feet)	M1	Ag Water. (acre-feet)		(acre-feet)		(acre-feet)		Water () (acre-feet)		District (acre-feet)	M1	Drain Water (acre-feet)		
January			0	0	0	0	0	0	0	0	0	0	0	0	0	0
February			0	0	0	0	0	0	0	0	0	0	0	0	0	0
March			0	0	0	0	0	0	0	0	0	0	0	0	0	0
April			0	0	0	0	0	0	0	0	0	0	0	0	0	0
May			0	0	0	0	0	0	0	0	0	0	0	0	0	0
June			22585	0	0	0	0	0	0	0	0	0	0	0	0	22,585
July			43715	0	0	0	0	0	0	0	0	1120	0	0	0	44,835
August			3936	0	0	0	0	0	0	0	0	0	0	0	0	3,936
September			392	0	0	0	0	0	0	0	0	0	0	0	0	392
October			0	0	0	0	0	0	0	0	0	0	0	0	0	0
November			0	0	0	0	0	0	0	0	0	0	0	0	0	0
December			0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL			70,628	0	0	0	0	0	0	0	0	1,120	0	0	0	71,748

Table 2
Ground Water Supply

2013 Month	District		Private Agriculture *(acre-feet)	ETo
	Method	Groundwater (acre-feet)		
January		0	3,309	0.77
February		0	5,329	1.24
March		0	11,948	2.78
April		0	22,950	5.34
May		0	30,686	7.14
June		0	31,073	7.23
July		0	33,222	7.73
August		0	27,420	6.38
September		0	22,478	5.23
October		0	15,558	3.62
November		0	5,415	1.26
December		0	5,845	1.36
TOTAL		0	215,234	50.08

Total Estimated
Groundwater Pumping 215,234

O1 *estimated based on 75% irrigation efficiency

Table 3

Total Water Supply

2013 Month	Surface Water Total		District Groundwater		Recycled M&I		Total District	
	Method	(acre-feet)	(acre-feet)	(acre-feet)	(acre-feet)	(acre-feet)	(acre-feet)	(acre-feet)
	M1						M1	
January		0	0	0	0	0		0
February		0	0	0	0	0		0
March		0	0	0	0	0		0
April		0	0	0	0	0		0
May		0	0	0	0	0		0
June		22,585	0	0	0	0		22,585
July		44,835	0	0	0	0		44,835
August		3,936	0	0	0	0		3,936
September		392	0	0	0	0		392
October		0	0	0	0	0		0
November		0	0	0	0	0		0
December		0	0	0	0	0		0
TOTAL		71,748	0	0	0	0		71,748

*Recycled M&I Wastewater is treated urban wastewater that is used for agriculture.

2013 Precipitation Worksheet					2013 Evaporation Worksheet				
inches precip	ft precip	acres	AF/Year		inches evap	ft evap	acres		
Jan	1.10	0.09	271.45	88.90	Jan	1.51	0.13	271.45	
Feb	0.51	0.04	1.70	0.56	Feb	2.17	0.18	1.70	
Mar	0.88	0.07	0.00	0.00	Mar	3.96	0.33	0.00	
Apr	0.41	0.03	133.33	43.67	Apr	5.86	0.49	133.33	
May	0.03	0.00	140.00	45.85	May	6.60	0.55	140.00	
Jun	0.11	0.01	65.84	21.56	Jun	7.71	0.64	65.84	
Jul	0.00	0.00	0.00	0.00	Jul	8.31	0.69	0.00	
Aug	0.00	0.00	0.00	0.00	Aug	7.85	0.65	0.00	
Sept	0.00	0.00	0.00	0.00	Sept	5.69	0.47	0.00	
Oct	0.02	0.00	0.00	0.00	Oct	3.75	0.31	0.00	
Nov	0.56	0.05	0.00	0.00	Nov	2.13	0.18	0.00	
Dec	0.31	0.03			Dec	1.56	0.13		
TOTAL	3.93	0.33			TOTAL	57.1	4.76		

Table 4

Agricultural Distribution System

2013

Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage (acre-feet)	Total (acre-feet)
Earth Canal	788,304	15	11,824,560	88.9	108	10,291	(11,602)
Conc. lined Canal	3,696	20	73,920	0.6	0	0	(8)
			0	0.0	0	0	0
Natural Channels	145,200	40	5,808,000	43.7	0	4,018	(4,609)
Berenda Reservoir	800	7,623	6,098,400	45.9	0	0	(620)
Regulating Ponds	1,000	2,868	2,868,151	21.6	0	1,000	(1,292)
	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	0.0	0	0	0
TOTAL			26,673,031	200.5	108	15,309	(18,130)

Table 5

Crop Water Needs

2013 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requiremen (AF/Ac)	Cultural Practices (AF/Ac)	Effective Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
corn	10,376	2.38	0.2	0.0	0.2	25,061
oats	1,450	1.33	0.1	0.0	0.2	1,837
alfalfa hay	10,430	3.61	0.4	0.0	0.2	39,379
irrigated pasture	430	3.70	0.4	0.0	0.2	1,665
silage	661	2.38	0.2	0.0	0.2	1,596
other forage	346	2.38	0.2	0.0	0.2	836
cotton	871	2.71	0.3	0.0	0.2	2,419
tomatoes	160	2.09	0.2	0.0	0.2	337
other vegetables	51	1.46	0.1	0.0	0.2	72
apples	33	3.27	0.3	0.0	0.2	112
berries	6	3.00	0.3	0.0	0.2	19
cherries	41	3.27	0.3	0.0	0.2	139
grapes	6,085	3.11	0.3	0.0	0.2	19,617
almonds	28,882	3.50	0.4	0.0	0.2	105,419
pistachios	2,624	3.00	0.3	0.0	0.2	8,134
walnuts	541	3.48	0.3	0.0	0.2	1,960
other fruits	2,363	3.25	0.3	0.0	0.2	7,975
wheat	3,450	1.33	0.1	0.0	0.2	4,370
other	324	3.00	0.3	0.0	0.2	1,004
prunes / plums	151	3.30	0.3	0.0	0.2	518
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
Crop Acres	69,275					222,469

Total Irrig. Acres 69,275 (If this number is larger than your known total, it may be due to double cropping)

Table 6

2013 District Water Inventory

Water Supply	Table 3	71,748
Riparian ET	(Distribution and Drain)	minus 0
Groundwater recharge	intentional - ponds, injection	minus 0
Seepage	Table 4	minus 15,309
Evaporation - Precipitation	Table 4	minus 2,713
Spillage	Table 4	minus 108
Transfers out of District		877
Water Available for sale to customers		52,741
392 AF transfer to MID		
485 AF delivered to riparian water rights		
Actual Agricultural Water Sales 2013	From District Sales Records	52,746
Private Groundwater	Table 2	plus 215,234
Crop Water Needs	Table 5	minus 222,469
Drainwater outflow	(tail and tile, not recycled)	minus 0
Percolation from Agricultural Land	(calculated)	45,511
Unaccounted for Water	(calculated)	(5)

Table 7
Influence on Groundwater and Saline Sink
2013

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence	15,309
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	69,275
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0

Table 8

Annual Water Quantities Delivered Under Each Right or Contract

Year	Federal		Federal non-		Local Water		Other Water () (acre-feet)	Transfers into		Upslope Drain Water (acre-feet)	Total (acre-feet)
	Ag Water (acre-feet)	Ag Water. (acre-feet)	State Water (acre-feet)	Appropriati (acre-feet)	District (acre-feet)						
2004	88,629	0	0	155	0	2,688	0	0	91,472		
2005	161,115	0	0	15,255	0	72	0	0	176,442		
2006	148,559	0	0	81,894	0	540	0	0	230,993		
2007	107,917	0	0	173	0	855	0	0	108,945		
2008	87,871	0	0	18	0	1,700	0	0	89,589		
2009	118,396	0	0	0	0	0	0	0	118,396		
2010	137,591	0	0	18,206	0	18,099	0	0	173,896		
2011	157,876	0	0	74,523	0	661	0	0	233,060		
2012	114,210	0	0	755	0	4,611	0	0	119,576		
2013	70,628	0	0	0	0	1,120	0	0	71,748		
Total	1,192,792	0	0	190,979	0	30,346	0	0	1,414,117		
Average	119,279	0	0	19,098	0	3,035	0	0	141,412		