SAN LUIS WATER DISTRICT

2020 Water Management Plan

(2020 Criteria)

Final Approved by USBR – August 24, 2021

DATE SIGNED: **8-25-2021**

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A. History

San Luis Water District (SLWD or District) is located on the western side of the San Joaquin Valley near the City of Los Banos (see **Appendix B**). The earliest agricultural ventures in the area now included in SLWD took place prior to 1900 and consisted of the growing of small grains. Irrigation by private parties started in the late 1920's through the use of shallow wells. The availability of groundwater was limited, and the quality was relatively poor.

In the early 1950's the Delta-Mendota Canal (DMC), a major feature of the Central Valley Project (CVP), was constructed by the United States Bureau of Reclamation (USBR or Reclamation). During and after construction of the DMC, major development of farmland occurred on the western side of the San Joaquin Valley and led to the formation of SLWD and other water districts in the area.

SLWD was formed on January 23, 1951. The original size of SLWD was 50,576 gross acres (approximately 79 square miles). As a result of several inclusions and exclusions, the current gross acreage of SLWD is 64,554.

Historic population data for SLWD is not available. The current population within SLWD, including rural and urban areas, is approximately 1,900. The great majority of this population resides in and around the community of Santa Nella, which is located in the extreme northern portion of SLWD. Most of SLWD area is and will remain rural farmland with very few residents.

Irrigated acreage data is available beginning from 1960. Over the years, there has been a large shift in crop types from row crops to permanent crops (trees and vines).

Negotiations between SLWD and Reclamation for a water service contract began on January 24, 1951 when the District formally applied to Reclamation for CVP water. Pending completion of the long-term contract, SLWD began receiving water from the DMC in May of 1952 under temporary contracts with Reclamation. Improvement District No. 1 (ID 1) was formed in 1958 and currently consists of approximately 19,790 acres. A distribution system for ID 1 was completed in 1959. SLWD entered into a long-term contract with Reclamation on February 25, 1959 for a firm water supply of 93,300 acre-feet (AF). Temporary annual contracts were executed between 1964 and 1974 to provide for the delivery of municipal and industrial (M&I) water from the DMC.

The San Luis Unit of the CVP was constructed during the 1960's. SLWD began receiving agricultural and M&I service from the San Luis Canal (SLC) in 1967 through annual temporary contracts with Reclamation. Included as part of the construction of the San Luis Unit were nine CVP pumping facilities to provide water service to SLWD lands that are upslope of the SLC. Improvement District No. 2 (ID 2) and Improvement District No. 3 (ID 3), currently consisting of 5,640 and 10,690 acres, respectively, were formed in 1972 and receive service from the above-mentioned pumping facilities. On June 18, 1974, Reclamation and SLWD entered into a new long-term water service contract that provided for both agricultural and M&I service from either the DMC or SLC and increased SLWD's firm water supply to 128,000 AF. This contract does not identify specific quantities of agricultural versus M&I water nor does it identify specific quantities to be delivered from the DMC versus the SLC. SLWD also entered into a contract with Reclamation at this same time for a Public Law 130 construction loan to build distribution facilities for ID 2 and ID 3. These facilities were constructed during 1975 and 1976. Water deliveries to ID 2 and ID 3 began in January and March of 1977, respectively.

SLWD's water service contract was amended in 1975, as a result of excluding land from the District, to reduce the contract quantity by 2,920 AF. SLWD's current contract quantity is 125,080 AF.

Appendix C details SLWD's various water service contracts with Reclamation for project water. Contracts for non-project water, such as survival water contracts executed in 1977 and Warren Act contracts, are not included in **Appendix C**.

The Reclamation contract is SLWD's only long-term water supply. SLWD does not own any groundwater wells and has no other long-term contracts for surface or groundwater supplies. Approximately 6,000 acres within SLWD overlie usable groundwater supplies. The quality of the groundwater is poor, averaging in excess of 1,000 parts per million of total dissolved solids. Some of this acreage is served exclusively by wells, while in other cases the wells are used to supplement project water supplies. All wells in this area are privately owned and operated. SLWD does not have specific pumping information regarding these wells, but it is estimated each year that approximately 12,000 AF of groundwater is pumped annually. The District has plans to meter all of these wells within the next five years.

Recent Endangered Species Act (ESA) impacts have sharply constrained Delta pumping and reduced water supplies from the District's long-term CVP contract. These changes have reduced CVP allocations to SLWD from a historic average of 109,000 AF (1956-2007) to about 26,000 AF (2011-2020). Supplemental water transfers have always been used extensively by SLWD; however, the projected decreases in average CVP allocations will result in expensive supplemental water becoming the largest share of SLWD's water portfolio.

Virtually all of the transfers into SLWD are for a single year only and cannot be relied upon as a long-term supply. The District also has an extensive internal water transfer program for landowners and water users to better manage their water supplies to meet their needs.

Increasing water costs have caused significant changes in SLWD cropping patterns. Higher value permanent crops, such as orchards and vineyards have replaced row crops. Every indication is that the conversion away from row crops and towards orchards and vineyards will continue. **Table 5** in **Appendix G** illustrates the fact that over 75% of the irrigated land in SLWD was planted to permanent crops in 2020. Due to the increasing cost of supplemental water supply for the past five years, and the poor reliability of the CVP, the District cropping has been limited to permanent plantings with a slight decrease in overall cropping since 2015. The major limiting factors to

continued conversion are water supply and water supply reliability. The current unreliable nature of SLWD's water supply also acts as a detriment to continued conversion. There is an understandable reluctance by landowners to make the significant capital investments associated with an orchard or vineyard when the water supply is so uncertain and the long-term historic trend is a reduction in water supply reliability.

Irrigation methods have also changed over time. There has been a significant conversion to drip and micro irrigation systems over the last 15 years that has paralleled the above-mentioned crop conversion. In 2020, drip or micro irrigation systems were used in about 95% of irrigated acreage in the District. SLWD anticipates further increases of this percentage over time.

1. Date district formed: 1/23/1951

Date of first Reclamation contract: 1952 (temporary contract)

Original size (acres): 50,576 *Current year (water year)*: 2020*

*Data used in this WMP is for the 2020 'water year' which extends from March 1, 2020 to February 28, 2021.

2. Current size, population, and irrigated acres

	Year: 2020
Size (acres)	64,554
Population served	2008
Irrigated acres	32,928

3. Water supplies delivered in water year 2020

Water Source	*AF*
Federal urban water (Tbl 1)	549
Federal agricultural water (Tbl 1)	19,916
State water (Tbl 1)	0
Other Wholesaler (define) (Tbl 1)	0
Local surface water (Tbl 1)	0
Upslope drain water (Tbl 1)	0
District groundwater[1] (Tbl 2)	0
Banked water (Tbl 1)	0
Transferred water (Tbl 1)	55,354
Recycled water (Tbl 3)	0
Other (define) (Tbl 1)	0
Total	**75,819**

[1] The District does not own or operate any groundwater wells.

4. Annual entitlement under each right and/or contract

	AF/Y	*Source*	*Contract #*	*Availability period(s)*
Reclamation Urban	0			
Reclamation Agriculture	125,080	DMC/SLC	14-06-200-7773A	Ag and M&I supply, when contract water is available

5. Anticipated land-use change (for Ag contractors, also include changes in irrigated acres)

Some agricultural land has been converted to other uses, such as solar fields or endangered species mitigation banks. This trend is expected to continue due to water reliability issues. Currently SLWD has one residential development (59 residential connections) within its boundaries. Some other developments have been proposed for the area, but their timeline is unknown. There are no expected increases in urban demands since SLWD will likely require new urban developments to de-annex from the district due to lack of reliable water supplies.

6. Cropping patterns (Agricultural only)

Original Plan (1999)		*Previous Plan (2015 Data)*		*Current Plan (2020)*	
Crop Name	***Acres***	***Crop Name***	***Acres***	***Crop Name***	***Acres***
Alfalfa	2,176	Almonds	19,926	Almonds	21,135
Almonds	9,204	Wheat	4,396	Wheat	1,999
Beans	2,312	Pistachios	1,975	Pistachios	2,782
Cotton	11,518	Cotton	1,907	Cotton	1,326
Melons	4,858	Pasture & Range, Non-Irrigated	1,845	Pasture & Range, Non-Irrigated	1,905
Tomatoes	4,104	Tomatoes	1,540	Tomatoes	1,813
Other (<5%)	8,760	*Other (<5%)*	5,910	*Other (<10%)*	4,238
Total	**42,932**	***Total***	**37,499**	***Total***	**35,198**

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

Original Plan (1999)		*Previous Plan (2015 Data)*		*Current Plan (2020)*	
Irrigation Method	***Acres***	***Irrigation Method***	***Acres***	***Irrigation Method***	***Acres***
Surface	16,326	Surface	3,646	Surface	1,307
Sprinkler	15,267	Sprinkler	434	Sprinkler	1,659
Drip & Micro	9,584	Drip & Micro	25,410	Drip & Micro	27,627
Total	**41,177**	***Total***	**29,490**	***Total***	**30,594**

Note: The difference between total acreage in Tables 6 and 7 for the Current Plan (2020) comes from the inclusion of dry farming (1,986.5), the use of stock water (287.0 ac), and well water usage without reported irrigation type (2,330.5), in Table 6.
Note: Surface Irrigation is a combination of furrow and border strip irrigation.

B. Location and Facilities

See **Appendix B** for maps containing the following: incoming flow locations, turnouts, outflow points, conveyance systems, reservoirs, District boundaries, drainage areas, and State and Federal facilities. The District does not have wells, groundwater facilities or water quality monitoring locations.

1. Incoming flow locations and measurement methods

Location Name	*Physical Location*	*Type of Measurement Device*	*Accuracy*
Delta-Mendota Canal	25 Turnouts	Propeller Meter	6%+/-
San Luis Canal	12 Turnouts	Venturi	6%+/-
San Luis Canal	23 Turnouts (Direct Service)	Propeller	6%+/-

2. Current year Agricultural Conveyance System

Miles Unlined - Canal	*Miles Lined - Canal*	*Miles Piped*	*Miles - Other*
3.2	14.3	52.0	0

The unlined canal section has been evaluated for lining but is not a good candidate due to its location in a flood zone. During floods the canal frequently fills with water and silt. SLWD uses high density polyethylene for canal liners, and this material can be easily damaged during de-silting operations. As a result, SLWD is investigating special design features or technologies to allow canal lining.

3. Current year Urban Distribution System

Miles AC Pipe	*Miles Steel Pipe*	*Miles Cast Iron Pipe*	*Miles PVC Pipe*
0	0	0	1.2

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

Name	*Type*	*Capacity*	*Distribution or Spill*
Treated Water Tank	Bolted Steel	122,000 gallons	Neither

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

SLWD has 8 small reservoirs used to capture operational spills for pumping the water back into the delivery system. With the installation of automatic gate controllers and other canal improvements, operational spills are rare and of very limited volume.

6. Agricultural delivery system operation

Scheduled	*Rotation*	*Other (describe)*
100%		

7. Restrictions on water source(s)

Source	*Restriction*	*Cause of Restriction*	*Effect on Operations*
Federal CVP supply from the San Luis Canal and Delta-Mendota Canal	Contract limitations for CVP water supply (water shortage provisions of water service contract)	Water supply limitations, application of the ESA, and Delta water quality requirements	Variable water supply

8. Proposed changes or additions to facilities and operations for the next 5 years
No changes or additions to the District's facilities are proposed in the next 5 years (2021-2025). The District is fully developed and has a mature water conservation program.

Agricultural water demands are expected to remain relatively constant into the future. Urban demands are expected to decrease since SLWD is in the process of de-annexing Santa Nella County Water District. In addition, in the future SLWD will likely require that new urban developments also de-annex from the District.

C. Topography and Soils

1. Topography of the District and its impact on water operations and management
In general, SLWD's terrain slopes from west to east. Interstate 5 is the approximate dividing line between the hilly terrain to the west and the relatively level land to the east. Elevations within SLWD vary from 150 to 700 feet above sea level.

The hilly terrain in the western portion of SLWD prevents the use of surface irrigation methods. Virtually the entire acreage of ID 2 and ID 3 is irrigated with sprinkler or drip/micro irrigation systems.

Approximately 5,200 acres within SLWD have poor drainage. Drainage from this area is managed by a combination of public and private entities. Drainage from the majority of this land (3,752 acres) is managed by Charleston Drainage District (CDD). CDD collects and returns most of the drainage to reuse areas within CDD. The remaining portion of this drainage is collected and processed by the San Joaquin River Improvement Project. Pacheco Water District (PacWD) manages the drainage from another 792 acres. Drainage from the remaining 650 acres is managed privately. The location of the drainage areas in relation to the rest of SLWD is shown on the vicinity map in **Appendix B.**

Soil Problem	*Estimated Acres*	*Effect on Water Operations and Management*
Salinity	0	*No known salinity issues*
High water table	0	*No known high water table issues*
High or low infiltration rates	0	*No known infiltration rate issues*
Poor Drainage	5,200	*Managed by others (see Section 2.F)*

Reclamation has performed an Irrigation Suitability/Land Classification analysis for SLWD. Of the acres within SLWD eligible to receive a water allocation, approximately 10% were identified as Class 1 soils, 44% as Class 2, 42% as either Class 3 or 4, and 3% as Class 6. Classes 1 through 3 represent arable lands that are highly, moderately, and marginally suitable for irrigated farming, respectively. Class 4 represents lands suited for special uses and Class 6 represents land that is non-arable and non-irrigable.

2. District soil association map (Agricultural only)
See **Appendix B** for a table listing the soil units in SLWD.

3. Agricultural limitations resulting from soil problems (Agricultural only)
None.

D. Climate

1. General climate of the district service area

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Eto	1.13	1.98	3.64	5.42	7.29	8.23	8.59	7.74	5.63	3.87	1.93	1.15	56.6
Precipitation	1.62	1.69	1.43	0.59	0.36	0.07	0.03	0.03	0.10	.045	0.74	1.31	8.0
Average Temperature	44	48	53	58	64	72	76	75	71	62	51	44	60
Average Maximum Temperature	55	60	66	71	78	88	93	92	88	79	66	56	74
Average Minimum Temperature	36	38	41	44	49	56	59	58	55	47	39	34	46

Weather station ID: CIMIS Station 56 – Los Banos

Data period: June 1988 to January 2021

According to data from the National Centers for Environmental Information for the station in Los Banos, the area will have at least 290 freeze-free days in a year. The amount of freeze-free days is based on a 50% probability level and a frost temperature of 32 degrees F with the last frost date being February 10 and the first frost date being November 28.

2. Impact of microclimates on water management within the service area

During much of the irrigation season, the northern reaches of the District (ID 3) are prone to high winds generated over Pacheco Pass. Sprinkler irrigation is generally not practical in this area due to wind disruption of the sprinkler head pattern.

E. Natural and Cultural Resources

1. Natural resource areas within the service area

There are no natural resource areas within the District's service area.

Name	Estimated Acres	Description
None	0	

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

Not applicable.

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

There are no recreational or cultural resource areas within the District's service area. The District is adjacent to, but just outside of, the San Luis Recreation area.

Name	Estimated Acres	Description
None	0	

F. Operating Rules and Regulations

1. Operating rules and regulations

A copy of SLWD's Rules and Regulations is contained in **Appendix D**. The Rules and Regulations have been updated several times since 2015 including changes to Rule No. 7 pertaining to water transfers into and out of the district. Adopted changes include the removal of all permanent water transfers. Only annual and multi-year water transfers of less than 5 years are allowed when permitted by the SLWD Manager. This is the second amendment to Rule No. 7.

2. Water allocation policy (Agricultural only)

See Rule No. 6 of the district's Rules and Regulations (**Appendix D**).

Rule No. 6 provides information regarding water allocations. SLWD annually allocates the available CVP supply on a pro-rata acreage basis to all eligible parcels that have requested water for that particular year.

The allocation process for any extra water purchased by SLWD is determined annually. Under severe water shortages, extra water has generally been made available on a pro-rata acreage basis, while under above-normal water conditions extra water has generally been sold on a first-come-first-served basis.

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

SLWD requires 24-hour notice for any change in a water delivery (i.e., order, adjustment, or cancellation). The 24-hour requirement is a result of SLWD's need to provide 24-hour notice of water deliveries to the California Department of Water Resources (DWR) and the San Luis & Delta-Mendota Water Authority (SLDMWA). However, SLWD often accepts water delivery changes from water users on less than 24-hour notice as long as the changes will not adversely impact operations of the DMC or SLC.

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

Rule No. 4 (**Appendix D**) requires landowners to construct and maintain adequate drainage facilities so that adjacent or lower lying lands are not harmed by runoff and to ensure that water is being beneficially used. As a result of the high cost of SLWD water and the limited supply available, all irrigation runoff (tail water) is kept on-farm. Discharge of tail water is prohibited by Rule No. 4. The majority of land within SLWD does not have a drainage outlet. A small area of SLWD, consisting of approximately 5,200 acres, has a drainage outlet to the San Joaquin River Improvement Project.

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

Rule No. 7 (**Appendix D**) addresses water transfers. SLWD encourages and supports water transfers. However, since SLWD is chronically short of water, growers may only transfer water out to lands they own in other CVP districts, and the transfers cannot be permanent. A guiding principle for transfers out of the District is that such transfers shall not create an adverse impact on SLWD landowners and/or water users. In addition, the District has an extensive internal water transfer program.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers

The district had approximately 108 farming entities during the water year 2019-2020. The number of farming entities varies slightly from year to year.

Refer to BMP A.1. Information on water measurement for agricultural contractors is completed under BMP A.1 on page 26.

2. Urban Customers

a. *Total number of metered connections:* 163

b. *Total number of connections not billed by quantity:* 0

c. *Total number of metered and un-metered connections: 163*

d. Percentage of water that was measured at delivery point: 100%

e. Percentage of delivered water that was billed by quantity: 100%

f. Measurement device table

Meter Size and Type	*Number*	*Accuracy[1] (+/- percentage)*	*Reading Frequency (Days)*	*Calibration Frequency (Months)*	*Maintenance Frequency (Months)*
5/8-3/4" nutating disc	118[2]	+/- 5.5%	monthly	60	as needed
1" nutating disc	4	+/- 5.5%	monthly	60	as needed
1" Propeller	7	+/- 5.5%	monthly	60	as needed
1 ½" nutating disc	2	+/- 5.5%	monthly	60	as needed
2" nutating disc	3	+/- 5.5%	monthly	60	as needed
2" propeller	17	+/- 5.5%	monthly	60	as needed
3" propeller	2	+/- 5.5%	monthly	60	as needed
4" propeller	4	+/- 5.5%	monthly	60	as needed
6" propeller	2	+/- 5.5%	monthly	60	as needed
8" propeller	1	+/- 5.5%	monthly	60	as needed
10" propeller	2	+/- 5.5%	monthly	60	as needed
Venturi[3]	1	+/- 6%	twice week	annually	as needed
Total Meters	**163**				
Total Customers	**104**				

Notes

(1) Historically the District has calibrated meters only on an “as needed” basis and has not maintained calibration records. During the 2016-2020 Plan period, the District implemented a comprehensive program to test and calibrate all meters at least once every five years. All District meters have been calibrated and found that every meter reads within the allowable error of less than 5%.

(2) Includes two meters each for 59 customers, one for treated water and one for non-treated irrigation water.

(3) Wholesale turnout delivers water to Santa Nella County Water District. Meter is owned, maintained, and calibrated by DWR.

Wholesale M&I water is delivered from a metered turnout on the SLC to Santa Nella County Water District (SNCWD). DWR owns, maintains, and calibrates the master meter at the turnout.

SNCWD operates and maintains its own treatment plant and distribution system. SNCWD delivered 322 AF to approximately 560 service connections in 2020. SLWD does not have specific information regarding the number of maintenances, calibration, and frequency of meter reading for the SNCWD system.

All M&I water delivered directly to the customer by the district is metered, and the water use is billed on a monthly basis. All new developments are required to install meters on all connections (treated and untreated water). All meters purchased and installed have an initial factory calibrated accuracy of +/- 2%.

3. Agricultural and Urban Rates

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

See **Appendix E** for detailed information on agricultural water rates and fees.

Urban water fees are collected monthly and are summarized in the table below.

Urban Water Rates (2020)			
Description	***Monthly***	***CCF[1]***	***AF***
Service Fee	$10.50	-	-
Treated water (indoor use)	-	$27.78	$12,078
Raw water (outdoor use)	-	$0.45	$195

1) CCF = 100 cubic feet or 748 gallons

b. Annual charges collected from agricultural customers

Fixed Charges			
Assessment Code	***Acres / Parcels***	***Rate***	***Total***
AS0032-Standby Charge-Per Acre	56,794.44	$4.70	$266,933.87
AS0033-Standby Charge-Per Parcel	514	$4.70	$2,415.80
AS0435-ID No. 3 O&M Standby Charge	11,096.93	$20.00	$221,938.60
			$491,288.27

*Assessments summarized in this table do not provide for any water deliveries. With the exception of the $4.70 Standby charge and the $20.00 O&M charge for ID 3, all water delivery charges are quantity based and determined exclusively by metered usage.

Volumetric charges			
Charges ($ unit)	***Charge units***	***Units billed during year***	***$ collected ($ times units)****
(Ag) $171.42-$700 Average $359.55/AF	$/AF	76,763 AF	$27,754,401
(Untreated M&I) $113.35-$218.56 Average $156.23/AF**	$/AF	529 AF	$82,647
(Treated M&I) $3,390/AF	$/AF	25 AF	$84,750

*The $ collected is an estimate and is not an audited value. There is significant variability in the value of the water types delivered by the District. The water types delivered in the District range from allocated water (where costs are only delivery fees) to water acquired by the District to supplement its water supply. The cost of supplemental water can vary significantly depending on year type. Furthermore, the water is sold in blocks to growers prior to the water passing the meter, so any water the District sold may not be delivered in the year it's bought, therefore the charges only represent the rate of which the District sold water, not necessarily the value of the water that was delivered in any given year. The value of the water delivered to each user varies depending upon the supply of CVP allocated water and supplemental water that the user has requested. Since the charge ($/unit) includes the running average for the supplemental pools developed by the District to augment allocations, the $ collected may not be an accurate representation of what the District actually received.
**Average water costs for M&I supplies are lower than for ag. CVP M&I capital obligations have been retired and ag supplies include more expensive supplemental sources. Due to the M&I reliability preference, the great majority of M&I supply is derived from the District's long term CVP contract.

Subsequent to 2009 implementation of Biologic Opinions for Delta Smelt and salmonids, associated Delta pumping constraints reduced average SLWD CVP allocations (5-year, 10-year, 15-year, and 20-year weighted average supply has been 7%, 21%, 32%, and 40%, respectively). The difference between CVP allocations and demand must be satisfied by costly supplemental water. Prices for supplemental water are market driven and vary dramatically by source and water year type.

c. *Describe the contractor's record management system*

SLWD has a sophisticated data management system for water usage information and accounts. The water supply shortages that began occurring in 1990 resulted in SLWD having to implement and modify policies affecting both water and financial operations. For example, prior to water shortages, SLWD's primary water function was to meter deliveries to all water users and to bill accordingly. Water shortages forced SLWD to formally allocate the limited supply. In addition, shortages resulted in significantly more water transfers and introduced many additional types or categories of water, each with unique associated costs.

SLWD collaborated with others in developing a custom personal computer-based data management system. In general, the District wanted the software to manage all water transactions (allocations, orders, transfers, deliveries, etc.) and most financial transactions (billings, cash receipts, and accounts receivable). A separate accounting program would be used to handle general ledger, accounts payable, and payroll transactions. The District also desired features to facilitate the management of parcel, name, field, and turnout information. This custom software was named STORM and is now in use by numerous districts.

All SLWD water information, such as turnout deliveries, allocations, transfers, etc. is managed with STORM. This data is available to growers in a variety of formats. Data regarding water usage and remaining water quantities is routinely distributed on a monthly basis and is also made

available upon request. STORM can accommodate the tracking of water usage data to the field level if field information is supplied when water is ordered.

Water delivery data for turnouts and SLWD pumping plants on the DMC and SLC since 1958 is available. Water delivery information from SLWD turnouts since 1977 is available. This data has been computerized and is available upon the request of a landowner or water user.

Water charges for both agricultural and M&I customers are almost exclusively based on usage (water-based) charges. All parcels are assessed a standby charge to cover a portion of SLWD's administrative costs. With the exception of the stand-by charge the balance of water costs are usage based. One minor exception of note is ID 3, where deliveries are too small to cover Operations & Maintenance (O&M) revenue requirements. Parcels within the Improvement Districts are assessed one or more additional charges to repay capital costs associated with their respective water distribution systems. All assessments and standby charges are paid in two equal installments due January 1 and September 1 of each year.

Reclamation's cost of the allocated supply plus the SLDMWA's costs for operating and maintaining the federal delivery system is billed to landowners. A water application and a deposit billing are sent to landowners annually. The water application allows landowners to purchase none, a portion, or the entire amount of water available for that particular year. Failure to return a completed water application and to pay the deposit by March 1, results in the loss of a water allocation for that year. The final water billing detailing the exact quantity allocated to each parcel, the associated cost, the deposit payment made, and the remaining quantity owed is sent in June and is due July 1.

Water usage charges are billed on a monthly basis and include SLWD administrative charges, Reclamation's Restoration Fund charge, O&M charges associated with Improvement District or M&I development distribution systems, and other miscellaneous charges. Billings are generally generated by the tenth of the month following usage and become delinquent the tenth of the second month following usage. A uniform rate structure is used for water usage charges. STORM allows a tremendous amount of flexibility in assigning water rates for water usage billings. Water rates can be assigned to water categories, turnouts, fields, water users, or to any combination of these variables. Over 13,000 water rate assignments have been entered and are analyzed as part of each water usage billing. The STORM billing process uses a linear optimization algorithm to calculate the lowest possible cost for each water user. This process involves analyzing the actual location and quantity of water usage, the type and quantity of water supply available to a given water user, and the above-mentioned water rate possibilities. This sophisticated billing process has allowed SLWD to handle the billing complexities associated with multiple types of water and multiple water rates while at the same time simplifying the billing process for water users through the assurance that the bill generated represents the least possible cost. Water rate information is provided in **Appendix E**.

The Rules and Regulations in **Appendix D** contain additional information regarding charges and billing procedures. Rule No. 8 of Article I addresses water allocation, water delivery, and standby and assessment charges. Paragraph III of Article II specifically addresses billing and collection procedures for domestic water and/or sewer service.

See **Appendix F** for a sample water bill, which are sent to growers monthly. The bill clearly shows how much water was used and that it is billed on a volumetric basis. SLWD can provide extra copies of the bills for the past several years upon grower request.

H. Water Shortage Allocation Policies

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

The available CVP supply is allocated on a pro-rata acreage basis to all eligible parcels whose owners have requested an allocation for that particular year. SLWD's water service contract requires that all agricultural water that is converted to M&I use be treated as an agricultural supply in the event of a water shortage. Consequently, all parcels within SLWD are generally treated equally for allocation purposes (Rule No. 6, **Appendix D**). The one exception to this is Reclamation's practice during recent water shortage years of allocating SLWD a quantity of M&I water based on "historical" M&I usage prior to 1990. When this has occurred, SLWD has generally maintained this same distinction when allocating water to property. No preference is given based on the type of crop being grown.

SLWD could not survive without the importation of supplemental supplies. Historically those supplies augmented the District's CVP allocations. In recent years, that trend has been reversed and a majority of the District's supplies are imported from sources other than its long-term CVP contract. Both the District and individual growers must aggressively pursue other water supplies to avoid loss of permanent crops.

Additional information on water allocation procedures is included in Rule No. 6 of the Rules and Regulations (**Appendix D**).

SLWD also has a Drought Management Plan found in **Appendix I**. The plan documents the water shortage allocation policy, procedure for determining drought severity, policy for declaring droughts, operational adjustments to droughts, mitigation actions, and impact of droughts on revenues.

2. Current year policies that address wasteful use of water and enforcement methods

The General Manager has the authority to immediately terminate water deliveries to any water user that is wasting water (See Rule No. 4 in **Appendix D**). The limited quantity of extremely expensive water available to SLWD water users has virtually eliminated wasteful use and the need to exercise this authority.

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

The criteria and policies governing the Bay-Delta have restricted water deliveries to SLWD. Both the quantity and reliability of water deliveries to the District have been seriously eroded. These policies need to be revised or the water supply augmented, if SLWD is ever to receive a reliable water supply again.

Section II: Inventory of Water Resources

A. Surface Water Supply

SLWD's only long-term source of water is Contract No. 14-06-200-7773A with Reclamation for 125,080 AF/year. This supply equates to a maximum supply of 2.1 AF per acre to those parcels within SLWD eligible to receive an allocation. SLWD does not have a contract for SWP water nor does it have any other source of local surface supply.

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

See Water Inventory Tables, Table 1 (**Appendix G**).

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

See Water Inventory Tables, Table 8 (**Appendix G**).

B. Groundwater Supply

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

None by SLWD. See Table 2 in **Appendix G** and Section 2.B.5 below.

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

Name	Size (Square Miles)	Usable Capacity (AF)	Safe Yield (AF/Y)
Delta Mendota	187.5	Unknown	115,000+ historic
Los Banos Creek Valley Sub Area	7.5	Unknown	10,000-15,000 estimated

Note: Only a small portion of these basins underlie SLWD

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

The District does not own any wells or currently operate managed groundwater recharge areas.

4. Description of conjunctive use of surface and groundwater

The District participates in the Meyers Family Farms Groundwater Bank, which is described below under 6. Groundwater Banking Plan.

5. Groundwater Management Plan

In 2014, the California legislature passed the Sustainable Groundwater Management Act (SGMA) to bring aquifers to a sustainable condition. SLWD is located above Northern & Central Delta-Mendota region of the Delta-Mendota Subbasin. The region is located at the western edge of the subbasin and lies within five counties including San Joaquin, Stanislaus, Merced, Fresno, and San Benito. SLWD and seven other federal contractors in the same geographic area cooperated in the development of a Groundwater Sustainability Plan (GSP) in compliance with SGMA. A copy of the GSP be found on the SLWD website.

The Delta-Mendota sub-basin of the San Joaquin Basin underlies a portion of SLWD. The San Joaquin Basin is a 13,500 square-mile basin with a storage capacity of 570,000,000 AF and a usable capacity of 80,000,000 AF (DWR Bulletins 118-75 and 118-80).

SLWD does not own or operate any groundwater wells. There are approximately 22 private agricultural wells located several miles south of Los Banos that provide all or a portion of the water supply to approximately 6,000 acres within the District Service Area (DSA). There are no agricultural wells within the three improvement districts. SLWD estimates that landowner wells within the DSA pump approximately 12,000 AF annually.

The horizontal groundwater flow direction in the semi-confined zones is northeast, towards the San Joaquin River from the Coast Ranges, typically causing subsurface outflow from the area. In the confined zone beneath the Corcoran Clay, water tends to move southwesterly.

SLWD has participated with the SLDMWA and other neighboring districts in the approval and implementation of annual programs to allow individual landowners to pump groundwater into the DMC for credit.

6. Groundwater Banking Plan

SLWD does not have a groundwater recharge or banking project of its own. SLWD has stored water in the Kern Water Bank in the past. Meyers Family Farms has developed private groundwater banking facilities located outside SLWD. A primary purpose of the facilities is to provide a more secure water supply for the individual's orchards located within SLWD. The District assists by facilitating the water exchange with USBR so banked water can be returned to the District. The District currently has 5,000 acre-feet stored in this bank.

C. Other Water Supplies

1. "Other" water used as part of the water supply

SLWD has no other long-term supplies of either surface or ground water. Due to ESA-driven water allocation reductions and drought, SLWD routinely purchases supplemental water on the open market. Most such purchases are for one year; however, a few supplemental water sources are based on five-year agreements.

The only other source of water for SLWD is precipitation. SLWD has assumed that 50% of the precipitation in December and January and 100% of the remaining precipitation is considered effective.

D. Source Water Quality Monitoring Practices

1. Potable Water Quality (Urban only)

SLWD operates a water treatment facility supplying treated water to homes and several commercial customers. A copy of the District's latest Consumer Confidence Report is included as **Appendix H**.

2. Agricultural water quality concerns: *Yes* _____ *No* X

SLWD does not independently monitor surface water quality in the DMC or SLC. Water quality in these canals is monitored by the SLDMWA and the DWR and is available to SLWD upon request. Agricultural and M&I use is not limited by the quality in either of these canals.

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

DWR routinely monitors water quality in the SLC at numerous points for total dissolved solids (TDS), electrical conductivity (EC), salinity, chlorides, and numerous other constituents. The SLDMWA monitors water quality in the DMC at numerous locations, routinely testing TDS, EC, salinity, selenium, boron, arsenic, and mercury. See **Appendix L** for a comprehensive description of the monitoring plan.

All groundwater wells participating in the DMC pump-in program (where growers are paid to pump groundwater into the DMC) are analyzed at least once every three years for agricultural constituents. Wells upstream of check 13 are tested for the full suite of Title 22 Drinking Water standards. **See Appendices L** and **M** for more information. The District contracts with certified labs to collect and analyze samples.

The District is a member of the West Side San Joaquin River Watershed Coalition pursuant to the Regional Board's Irrigated Lands Regulatory Program. Water quality samples are occasionally taken at four sample points in the District. EC and toxicity analyses are initially performed. If laboratory flora or fauna responses indicate toxicity, samples are further analyzed for pesticides and herbicides. Flows at the District's sampling points occur infrequently and only during substantial local storm events.

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

DWR routinely monitors water quality in the SLC at numerous points for TDS, EC, salinity, chlorides, and numerous other constituents. The SLDMWA monitors water quality in the DMC at numerous locations, routinely testing TDS, EC, salinity, selenium boron, arsenic, mercury, and other constituents. **See Appendix L** for more information.

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

See **Appendix M** for sample laboratory reports from wells participating in the DMC Groundwater Pump-in program.

E. Water Uses within the District

1. Agricultural

See Water Inventory Tables, Table 5 - Crop Water Needs in **Appendix G**

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

The table below lists the acreage of different irrigation methods used in SLWD. Data is not available to correlate irrigation system use with exact acreage of each crop type. However,

based on past data and local knowledge, the typical crops used for each irrigation method are provided.

Irrigation System	Acreage	Percent	Typical Crop Types
Border Strip / Furrow	1,307	4%	Border Strip - Alfalfa, Corn, cotton, Wheat
			Furrow - Alfalfa, Corn, Cotton, Melons, Oats, Tomatoes, Vegetables, Mixed (Fresh Market), Wheat
Sprinkler	1,659	6%	Alfalfa, Almonds, Cherries, Cotton, Melons
Low Volume	27,627	90%	Alfalfa, Almonds, Apples, Apricots, Cherries, Citrus, Corn, Cotton, Melons, Oats, Olives, Peaches, Pistachios, Prunes, Tomatoes, Vines, Walnuts
Total	30,594	100%	

Note: The difference between total acreage in this table and the table in Section A.6 comes from the inclusion of dry farming (1,986.5), the use of stock water (287.0 ac), and well water usage without reported irrigation type (2,330.5).

3. Urban use by customer type in current year

Customer Type	*Number of Connections*	*Year 2020 Use (AF)*
Single-family	59	66
Commercial	6	17
Wholesale	1	322
Other	10	144
Total	83	549

The District serves urban water uses with a portion of its M&I water supply and the urban water use total should not be confused with the District's M&I total water use. Urban water users include the San Luis Hills water system, truck plaza businesses, and Santa Nella County Water District (SNCWD). San Luis Hills water users are served by the District and have a dedicated line for raw outdoor water and a dedicated line for treated indoor water. Santa Nella County Water District receives wholesale urban water from the District to serve their connections.

No increases in urban use are anticipated. In fact, urban use within SLWD is expected to decrease as SLWD and SNCWD are actively working to de-annex SNCWD from SLWD. Under the proposed de-annexation, SLWD would partially assign a portion of its current CVP allocation to SNCWD. Additionally, the latest water permit issued for the San Luis Hills area mandates that no new residential or commercial connections be made to SLWD. The only feasible development would need to utilize groundwater, which would not occur on any significant level due to the lack of good quality groundwater throughout most of the District

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

Treatment Plant	Treatment Level (1, 2, 3)	AF	Disposal to / uses
San Luis Hills/Plaza	3 (Tertiary)	23	Landscaping, spray field, & fire control
	Total	23	
Total discharged to ocean and/or saline sink		0	

SLWD owns and operates a 75,000 gallon per day tertiary treatment wastewater facility. This facility has been operational since 1994 and is designed to serve approximately 60 homes and several commercial businesses (San Luis Hills/Plaza). The treated effluent is stored on site in a lined pond. A minimal amount is used for landscape irrigation associated with the commercial users, and the balance is discharged as necessary to a designated spray field. Water in the lined storage pond can also be used for fire control.

5. Groundwater recharge in current year (Table 6)

Recharge Area	Method of Recharge	AF	Method of Retrieval
Myers Groundwater Bank	Infiltration	112	Exchange

Geologic conditions preclude intentional groundwater recharge in most of SLWD. There is no managed groundwater recharge occurring within SLWD. Minimal deep percolation infiltrates to a usable groundwater source and is considered incidental groundwater recharge, while the remainder infiltrates to a saline sink or in areas that have no usable groundwater. Outside of the District boundaries, SLWD participates in the Myers Groundwater Bank and deposited 112 AF in 2020.

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

In nearly all year types, SLWD must transfer into the District additional supplies to meet water needs. Over the past 20 years increasingly diminished CVP water allocations have exacerbated the water supply shortfall.

The number of “internal” transfers is dependent upon the CVP allocation and SLWD’s allocation policy. Another key factor affecting the number of internal transfers is SLWD’s allocation policy. For a number of years, SLWD allocated water directly to water users (i.e., lessees or landowners farming their own property). Beginning in 1993, SLWD decided to allocate water to landowners. Each landowner was then responsible for transferring some or all of the allocation to the actual water user on his/her property. This change was made to ensure that landowners had complete control of the water allocation associated with their property. This policy change greatly increased the number of internal transfers.

In 2020 SLWD performed numerous small transfers with many different agencies. This situation is typical since SLWD can have difficulty securing large or long-term transfers, and typically multiple small transfers are needed to meet water demands. Details of all the transfers are not considered relevant and are not provided here, but SLWD did transfer in 41,868 AF in 2020.

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

Given the chronic shortfall of CVP allocations, transfers out of the District are generally limited in number and quantity. Grower transfers out of the District are prohibited except for a grower transferring to lands they hold in other districts. In addition, the District has adopted policies further limiting transfers out of the District during low allocation years.

In 2020, SLWD transferred 4,807 AF out of the District.

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

SLWD has an annual wheeling arrangement with Central California Irrigation District (CCID) and Reclamation for approximately 400 AF of water. Approximately 150 acres in the DSA near the northern boundary of SLWD do not have a distribution system from the DMC or the SLC. Since this property is located adjacent to CCID's Outside Canal, arrangements have been made for CCID to wheel a portion of SLWD's federal water supply to this property.

From Whom	*To Whom*	*2020 (AF)*	*Use*
CCID	SLWD	229	Irrigation
	Total		

SLWD does not have any other major wheeling agreements.

SLWD participates in the "Water Reallocation Agreement Among the United States, Santa Clara Valley Water District, and the San Luis & Delta-Mendota Water Authority," executed in April of 1997. The main purpose of the agreement is to encourage Santa Clara Valley Water District (SCVWD) to maximize the use of SWP and local water supplies and to minimize the use of CVP supplies, thereby making more CVP supplies available to other contractors with the SLDMWA. Prior to this agreement, SCVWD had been reluctant to minimize the use of CVP supplies since Reclamation's M&I allocation formula was based, in part, on historical usage. The agreement calls for certain districts within the SLDMWA to provide the difference between 75% of SCVWD's contractual supply and 75% of SCVWD's historical usage in those water short years when Reclamation's M&I allocation process would be applicable. In return for this increased level of certainty, SCVWD agreed to provide 100,000 AF of water, within a 10-year period, to those districts providing the increased certainty. SLWD is one of the districts providing the increased certainty. This agreement runs through 2023. SCVWD has delivered their 100,000 acre-foot obligation. Signatories to this agreement, including SLWD, have specific reciprocal obligations if in the future certain M&I shortage conditions occur.

8. Other uses of water

Other than those stated above, the District has no additional uses of water.

Other Uses	*AF*
None	

F. Outflow from the District (Agricultural only)

Aside from runoff generated only in substantial storm events, no water flows out of the District except limited subsurface drainage from a drainage management area. These drainage flows are measured and managed by Charleston Drainage District (CDD).

Specific drainage volumes for 2020 are not yet available from CDD. However, in past years they collected approximately 2,000 AF of drain water. Of that amount, some is recycled and blended to irrigate crops, while the rest is delivered to the San Joaquin River Improvement Project (SJRIP) area or discharged to the San Joaquin River. The drain water is mingled with other drainage flows and there is no way to breakout reused drainage verses drainage that is discharged.

The District's drainage area (approximately 5,200 acres) is part of a 97,000-acre regional drainage entity known as the Grassland Basin Drainers (GBD). The GBD are formed together through an Activity Agreement under the umbrella of the SLDMWA. The GBD have entered into an agreement with Reclamation for use of a portion (28 miles) of the San Luis Drain to discharge subsurface drainage from these lands to the San Joaquin River.

These subsurface drainage waters are high in salinity, boron, and selenium. The subsurface drain water was historically discharged northerly into Grassland Water District and beneficially used for wetland purposes. In 1983 selenium was discovered to be detrimental to waterfowl in the wetlands areas. In order for the Grassland Drainers to continue to be able to discharge drain water to the San Joaquin River, an alternative management program was required.

In 1996 the Grassland Bypass Project was implemented to manage these subsurface drainage waters as they flow through the wetlands. This resulted in the use agreement for the San Luis Drain. The use agreement includes strict limits on how much drainage water (selenium and salt load) can be discharged to the San Joaquin River which subsequently were adopted by the Regional Water Quality Control Board into waste discharge requirements. The GBD have implemented a multi-phased management program to control drainage discharges.

The GBD have implemented policies to reduce and control drainage including limitation of tail water, selenium load allocation, a tradable selenium loads policy, and a monitoring program. Lands within SLWD have installed improved on-farm water application equipment through State Revolving Fund loans and have also installed a drain water recycling system to limit drainage discharge and conserve water supplies.

Further information on regional drainage issues can be found in the Westside Regional Drainage Plan in **Appendix K**. Additional information regarding long-term management within the Grassland Drainage Area can be found in the "Long-Term Drainage Management Plan for the Grassland Drainage Area," dated September 30, 1998, and as updated July 1, 1999. In addition, an annual report is prepared for the Grassland Bypass Project. Copies of these documents are available upon request.

1. Surface and subsurface drain/outflow

Outflow point	*Location description*	*AF[1]*	*Type of measurement*	*Accuracy (%)*	*% of total outflow*	*Acres drained*
SLWD Drainage Area	See **Appendix B**	700 (est.)	Propeller Meters	+/-6%	100%	5,194

1 – Value is estimated since 2020 data is not yet available from Charleston Drainage District

Outflow point	*Where the outflow goes*	*Type Reuse*
SLWD Drainage Area	Used on the SJRIP	Irrigation

Drainwater leaving the District is either reused on the SJRIP or discharged through the Grassland Bypass Project to the San Luis Drain. All drain water is measured by propeller meter at three pump stations. The drain water is mingled with other drainage flows and there is no way to breakout reused drainage verses drainage that is discharged.

Beginning in 2007, CDD began implementing an aggressive recycling program that recirculates the majority of the produced drain water back into the irrigation system to reduce the overall drainage production.

Additional details on the regional drainage plan are provided in **Appendix K**.

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

The District does not test the quality of outflow water. However, the Grassland Bypass Project does test water quality for subsurface drainage.

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

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse Limitation?*
Selenium	Bi-weekly	0.05 mg/L to 0.15 mg/L	.08 mg/L	selected crops/blending
Boron	Bi-weekly	4.8 mg/L to 6.8 mg/L	6.1 mg/L	selected crops/blending
EC	Daily	748 µs/cm to 6700 µs/cm	~5100 µs/cm	selected crops/blending

Water quality analyses are typically performed bi-weekly, as grab samples at the discharge point. EC reading are taken daily, Monday through Friday (holidays excepted).

Laboratory analyses are performed for selenium and boron. Field measurements for EC are performed using a calibrated field EC meter. Concentrations vary widely throughout the month and year. Approximate ranges by constituent are summarized above.

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.*

> *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)*

The District is not responsible for groundwater remediation or contaminant plume management; therefore, they are not involved directly in any Central Valley Regional Water Quality Control Board programs. Those responsibilities are assigned to other agencies such as cities, counties, the USEPA, or California Department of Toxic Substances Control. SLWD tries to stay informed of contaminant plumes and their management and remediation within District boundaries. SLWD also takes practical measures to prevent groundwater quality degradation.

The District conforms to requirements of the Regional Board's Irrigated Lands Regulatory Program by way of its membership in West Side Water Quality Coalition, support for which is funded by an assessment voluntarily imposed on each irrigated acre in the District. The District promotes the application of best management practices to improve the quality of run-off during major storm events.

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 active delivery points (turnouts and connections):* 212[3]

b. *Number of delivery points serving more than one farm:* 14 (at 4 different sites)

c. *Number of measured delivery points (meters and measurement devices):* 235

d. *Percentage of delivered water 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	235[1]	+/-6%	See Below	60	annually
Weirs					
Flumes					
Venturi	7[2]	+/- 6%		60	
Metered gates					
Acoustic doppler					
Other (define)					
Total	**242**				

1. Includes 70 meters maintained and calibrated by SLDMWA and DWR
2. Owned, maintained, and calibrated by DWR
3 Excludes inactive services which have been blind flanged

One hundred percent (100%) of the water deliveries within SLWD are metered. Deliveries through turnouts serving the DSA and through SLWD turnouts are metered with volumetric propeller meters. All pumping plants are equipped with venturi-type differential pressure flow meters. Meters on the DMC and SLC are maintained and calibrated by the SLDMWA and the DWR, respectively. The meters for turnouts on SLWD's distribution system are maintained and calibrated by SLWD. Every SLWD meter is inspected and maintained annually. Historically calibration has been performed when determined necessary by SLWD or when requested by a water user. All meters purchased by SLWD are accurate to within two percent when purchased

Meter readers routinely time the flow in District meters to confirm totalizer accuracy. The District has historically performed formal calibration tests of meters only on an "as needed" basis, only when discrepancies are noted. SLWD has not historically maintained calibration records for each meter. However, since the 2015 Water Management Plan update the district has maintained each meter and found all meters read within the allowable error of no greater than 6%.

The SLDMWA and DWR read meters weekly to semi-weekly. SLWD meters within IDs 1 and 2 are read daily, and ID 3 meters are read weekly.

There are approximately 125 water users within SLWD. Fourteen metered turnouts serve more than one customer. At these fourteen locations, in addition to the master meter, additional in-line propeller meters have been installed on each point of use. These sub-meters are on located on private property, are owned and maintained by the water users, and are used to allocate by user the total amount measured at each master meter. At all times the amount of water allocated to the sub meters equals the total recorded on the District's meter.

The SLDMWA calibrates 29 meters on the DMC, pursuant to a maintenance and measurement program approved by USBR. DWR reads, maintains, and calibrates 41 meters on the SLC.

The District also plans to start metering flow on all private wells within the next five years. The District does not own any wells.

The District's dispute policy is documented in their Rules and Regulation (see **Appendix D**). Rule No. 19 – Handling Disputes, discusses the process that would be used for disputes regarding meter readings and billings.

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

Name: Steven Stadler, P.E. *Title:* District Engineer

Address: PO Box 2135, Los Banos, CA 93635

Telephone: (209) 826-4043 *E-mail:* sstadler@slwd.net

Steven Stadler, P.E., the District Engineer, is the designated Conservation Coordinator. He is currently responsible for coordinating all District activities and goals discussed in the Water Management Plan. Specifically, the Water Conservation Coordinator assisted with planning new facilities, attending regular Board meetings, and implementing Best Management Practices. All these tasks further the goals and objectives in the USBR Best Management Practices Guidelines. Steven Stadler is currently designated to continue his role as the Conservation Coordinator. His responsibilities will include management and on-going evaluation of BMPs, identifying new water conservation and water management programs, maintaining records on BMPs including water supply statistics and expenditures, and preparing annual and five-year updates to the Water Management Plan. The is a part-time job for the District Engineer who also has several other responsibilities.

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

See Attachment 2, Notices of District Education Programs and Services Available to Customers.

The District maintains an extensive library of educational materials available upon request. Brochures and other literature are also made available for general distribution to interested parties.

The District holds a minimum of two workshops per year which all landowners and growers are strongly encouraged to attend. In the past the workshops have focused on water supply issues

and District policies. Beginning in the fall of 2021, participants will also be informed of evolving water management services and practices. Subjects will include topics such as on-farm evaluations, water quality management, pump testing, irrigation system conversions, and funding for grower projects.

The District has included links on the District website to informational webpages related to irrigation information and irrigation technology. Links include the Cal Poly Irrigation Training and Research Center website as well as Groundwater Sustainability and Irrigated Lands Regulatory Program plans.

The District regularly sends information to growers through the mail. During the past few years these have primarily included newsletters related to the Irrigated Lands Regulatory Program and Sustainable Groundwater Management Act. Copies of some of the SGMA newsletters are found in **Attachment 2**. Topics addressed included the Sustainable Groundwater Management Act, Groundwater Sustainability Plan preparation, groundwater sustainability, water quality and public outreach opportunities.

a. On-Farm Evaluations

1) On farm irrigation and drainage system evaluations performed or funded by the District using a mobile lab type assessment during the past five years

	Total in district	*# surveyed last year*	*# surveyed in current year*	*# projected for next year*	*# projected 2nd yr in future*
Irrigated acres					
Number of farms	0	0	0	0	0

The table above shows that the District has not performed or funded any on-farm evaluations, however, as described below, the District is facilitating grower efforts to perform evaluations.

Mobile Lab services were first made available to SLWD customers in 1986. Since then, they have been offered through several funding sources including SLWD, Los Banos Resource Conservation District, San Joaquin Valley Drainage Program, USDA Agricultural Research Service Water Management Unit, SLDMWA, USBR, and the Irrigation Training and Research Center at California Polytechnic University, San Luis Obispo. SLWD now posts organizations that will perform on-farm evaluations on the SLWD website.

Given rapidly increased water costs and diminished supplies, SLWD growers have become keenly aware of the need for on-farm efficiency. Given the soaring cost of water and limited availability, many, if not most growers, rely on irrigation consultants or trained farm staff for on-farm evaluations.

SLWD performed an in-depth agronomic analysis on all the farms within the Charleston Drainage District from 2013 – 2018 as part of their Drainwater Master Plan. The analysis presented an initial assessment of the water quality irrigation suitability constraints related to blending drain water with the district's surface water supply for use in Improvement Districts No.1 and No. 2. The analysis identified key water quality

thresholds based on district cropping patterns and quantified possible blending ratios based on idealized conditions. The District will make the data from the analysis available upon request.

In addition, in the future, the District will present an exhibit on on-farm evaluation funding opportunities (if any are presently available) with a representative present at the District's fall grower's workshop.

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

All SLWD delivery points are metered and totalized allowing customers to read meters serving their property as frequently as desired. The District also provides customers with documented monthly water use statements detailing water use by turnout within ten (10) days after the end of the month following delivery. SLWD routinely provides reports detailing all activity on a customer's water account (allocations, transfers, usage, etc.) along with actual deliveries through each turnout. The delivery report will also include deliveries to each field if a customer has chosen to supply field information. These reports are mailed to all customers at least monthly and are provided at any time upon request by phone, e-mail, or fax.

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

Due to the high cost of water, most growers are keenly aware that irrigation efficiency is critical. In SLWD most growers employ irrigation consultants or have on staff experts. A spot phone survey revealed that daily and weekly evapotranspiration (ET) data is typically accessed from California Irrigation Management Information System (CIMIS), Westlands Water District web site, and daily reports broadcast on KMJ radio.

Ground truthing by soil probing and crop observation is also critical to optimizing irrigation schedules and crop coefficients. Soil moisture data is collected by hand boring, soil probe, and increasingly by permanent probes which transmit real time soil moisture data. Private systems installed by larger growers in San Luis Water District have telemetered weather stations transmitting real time ET and other data from their dedicated weather stations. Several companies provide such instrumentation and routinely market such products to SLWD growers.

A large majority of district farmers have real time ET and soil moisture probes to set irrigation schedules. Within the next five years, the District will perform a survey of growers on who use these monitoring tools.

Although it is believed that growers throughout SLWD are aware of how to access this information, the District has posted the location of the local CIMIS station on its website.

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

SLWD does not independently monitor surface, ground, or drainage water quality. Water quality data for the DMC and the SLC, which are the sole sources of SLWD's water supply, are available from Reclamation, DWR, and/or the SLDMWA upon request.

As mentioned previously in this Plan, SLWD does not own or operate any groundwater wells. Private wells are used as a sole or supplemental source in only a small portion of SLWD. In those years where certain wells are allowed to discharge into the DMC, the SLDMWA conducts a thorough monitoring and management program regarding water quality.

The District's Groundwater Sustainability Plan contains significant information on the quality of groundwater in SLWD and surrounding areas. A copy of the plan is provided on the District's website (https://slwdwater.com/).

An extensive drain water quantity and quality monitoring program is conducted within the drainage area as part of the Grasslands Bypass Project (**Attachment 1**).

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

The District holds a minimum of two workshops per year which all landowners and growers are strongly encouraged to attend. In the past the workshops have focused on water supply issues and District policies. Beginning in the fall of 2021, participants will also be informed of evolving water management services and practices. Subjects will include topics such as on-farm evaluations, water quality management, pump testing, irrigation system conversions, and funding for grower projects. The District had planned to being this educational program in fall 2020, but the growers workshop was cancelled due to the pandemic.

The District regularly sends information to growers through the mail. During the past few years these have primarily included newsletters related to the Irrigated Lands Regulatory Program and Sustainable Groundwater Management Act. Copies of some of the SGMA newsletters are found in **Attachment 2**. Topics addressed included the Sustainable Groundwater Management Act, Groundwater Sustainability Plan preparation, groundwater sustainability, water quality and public outreach opportunities.

e. Other

None.

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

SLWD's water pricing structure is based almost entirely on volumetric delivery charges. With the exception of a standby charge, all of the District's water charges are quantity based. All water related costs are collected based on the volume of water delivered (see **Appendix G**). The District pricing structure also includes several incentive pricing policies that are discussed in Section 3.B.4 – Incentive Pricing. Refer to **Appendix E** for tables showing the District's water rates.

5. Evaluate and improve efficiencies of district pumps

When delivering water, District staff compares pump output against historic capacity. Underperforming pumps are refurbished when possible. Pumps are tested for efficiency every 5 years and 30 have been completed in the last 4 years. This program is funded by the San Luis & Delta-Mendota Water Authority.

	Total in district	# surveyed last year	# surveyed in current year	# projected for next year
Wells	0			
Lift pumps	30	6	6	6

B. Exemptible BMPs for Agricultural Contractors

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

1. Facilitate alternative land use

Drainage Characteristic	Acreage	Potential Alternate Uses
High water table (<5 feet)	0	None identified by SLWD
Poor drainage	5,200	Solar Development, Dry Land Farming, Habitat
Groundwater Selenium concentration > 50 ppb		To be determined by Charleston Drainage District, See Attachment 1
Lower productivity	15,000-18,000	Dry-land farming, urban development, energy projects, grazing and/or habitat

A generalized description of the District's 64,554 acres can be *approximated* as follows:

Ownership	Acreage	Uses
Private	27,856	Permanent Crops
Private	7,341	Annual Crops
Private	21,424	Frequently fallowed, grazing, habitat, roads, easements, future M&I
Private	1,916	M&I, Rural Residential, future M&I
USA	5,534	CVP project facilities, habitat, parks
State	481	Habitat, highway corridors

Approximately 15,000-18,000 acres of the District is generally lower producing due to soil type and/or micro-climate. Over time, it has been increasingly difficult for these lands to support the relentlessly increasing cost of water and production. They will likely remain permanently fallowed and their water supply transferred to more productive lands. Additional lands are periodically fallowed due to increasingly frequent water supply shortages. In low allocation years, many row crops are abandoned, and water supplies moved to permanent crops.

Less than 50% of the District is currently irrigated. Due to reduced water supply allocations and the shift towards higher valued permanent crops some lands will no longer be used for farming purposes. While some landowners are currently fallowing land on an annual basis to use the water allocation on permanent crops, very little water has been permanently stripped from farmland for these other uses. The District's Board of Directors has developed policies and procedures to facilitate and manage this shift in land and water use (See Rule No. 7.D. in **Appendix D**).

Multi-Year Lease Program

The District exercised a "Multi-Year" Lease Program, where-by landowners transfer their water rights to the District for either three or five years in return for an annual payment of $40 per acre. The result was a guaranteed annual income per acre to participating landowners, regardless of the CVP allocation, without the obligation to pay for their water allocation. In turn this water is

made available to higher value crops. This program continued through 2020 and is likely to continue into the future. The requirements of the program are explained in Rule No. 7 in the Rule and Regulations (**Appendix D**).

Land Retirement

The Record of Decision for USBR's San Luis Drainage Feature Re-evaluation identifies land retirement as a suitable alternative to the provision of drainage service. Out of the 5,200 acres in SLWD determined to be "drainage impaired," the District has secured a permanent, recorded, non-irrigation covenant from a landowner who has proposed the development of a solar energy project on these lands. This is an on-going process to develop the land. The remaining SLWD lands with a subsurface drainage problem will be retired, converted to alternative land uses, or provided drainage service. See **Attachment 1** for details.

The District also generally supports and encourages conversion to other land uses that use less water than irrigated crops, such as solar fields and endangered species mitigation banks. The District also supports non-irrigation covenants to help reduce water demands or to convert impaired lands to other uses.

2. Facilitate use of available recycled urban wastewater

Sources of Recycled Urban Waste Water	*AF/Y Available*	*AF/Y Currently Used in District*
San Luis Hills/Plaza Treatment Facility (2015)	23	4*

**Treated water in the lined reservoir is used for fire control and landscape irrigation as needed*

The only available source of recycled water is from SLWD's wastewater treatment facility, which treats to a tertiary level. This plant serves portions of the San Luis Hills community. As mentioned previously in this Plan, only a minor amount of development is served by this facility, and the annual production of treated wastewater is only 23 AF (2020). A portion of this total is required to remain in a lined reservoir for fire suppression purposes, and as much as possible is used for landscape needs associated with the businesses served by the facility. Any remaining amount is discharged to a designated spray field. No other uses are cost effective. No crop irrigation occurs within two miles of the treatment facility.

The District is close to de-annexing the Santa Nella County Water District and will likely require that new urban developments also de-annex from the District. Consequently, the district sees no other potential opportunities for sources of wastewater to recycle.

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

Approximately 95% of irrigated land is already drip or low flow systems. In addition, some of the crops not using low flow irrigation systems may not be conducive to those methods. As a result, this BMP has limited benefit to the District. Nevertheless, SLWD will continue to promote on-farm irrigation improvements.

SLWD previously supported a State Revolving Fund loan program to assist local growers with irrigation efficiency enhancements. The loan program is no longer available.

The District now provides links on their website for grant programs that fund irrigation system conversion. The programs linked on the SLWD website are related to financial and technical resources to support water management efficiencies for interested growers. More specifically, the website links include programs through Natural Resources Conservation Service (NRCS), and California Department of Food and Agriculture (CDFA).

4. Incentive pricing

Structure of incentive pricing	*Related goal*
Formal District Clearing House for Internal Water Trades	Encourages more efficient water use at the farm level
Bilateral Farm Trades	Encourages more efficient water use at the farm level
High unit water cost	Encourages more efficient water use at the farm level

Reclamation's Incentive Pricing handbook, dated June 1998, identified six examples of programs that meet the requirement of the incentive pricing BMP. SLWD has implemented three of these examples to encourage more efficient water use at the farm level. Following is a description of each of these programs:

Formal District Clearing House For Internal Water Trades – As previously explained, internal water transfers are used extensively by water users within SLWD. All internal transfers are administered by the District. The District maintains a specific water account for each water user that details the various categories of water available to the user and the transactions specific to each category (i.e., allocations, usage, transfer in or out, etc.). Written transfer agreements are required to transfer water from one user to another. Any financial arrangements between the buyer and seller are handled outside of the District transfer process. Water users are provided summaries, at least monthly, that detail all transactions, including transfers, to their water account.

In addition to internal transfers, SLWD allows landowners the opportunity to transfer some or all of their allocated supply to the District (Multi-Year Lease Program) in return for financial compensation. This water is then combined with other water acquired by the District and sold to water users within the District that request additional water supplies.

Bilateral Farm Trades – Because SLWD has chronically short water supplies, growers may only transfer water out of the District if they are transferring to land they own or lease in another district. Such transfers require the water user to execute a written transfer agreement with the District and the District to execute a formal transfer agreement, requiring Reclamation approval, with the receiving district. SLWD does not charge any type of transfer fee but does collect district administrative and O&M charges that would have been applicable had the transferred water been delivered within the District.

High Volumetric Pricing – In order to qualify as an acceptable program, Reclamation's Incentive Pricing handbook requires that: (i) the district's water supply is less than ET and the average on-farm efficiency is greater than 80%; or (ii) that the district's volumetric rates are higher than $75 per acre-foot. Section 2 of this Plan documented the water supplies available to the District and the ET of the various crops grown within the District. SLWD's water supply is clearly less than ET, especially since the implementation of ESA-driven pumping constraints in the Delta. Current long-term (5-year to 20-year) weighted average supply has been 7%-40% for federal contractors south

of the Delta. Most importantly, the District's volumetric rates all exceed $75 per acre-foot, providing a costly but very effective incentive to conserve.

5. Conveyance Infrastructure

a) Line or pipe ditches and canals

SLWD's current distribution system consists of 52 miles of pipelines, 14.3 miles of lined canals, and 3.2 miles of unlined canals. Consequently, over 95% of the District's water delivery system is either pipeline or lined canal.

In 2009, SLWD applied for and received a CALFED Water Use Efficiency Grant to install HDPE lining in 3.2 miles of unlined canal. The District ultimately decided not to accept the grant because this section of canal is prone to periodic over-topping during major storm events. It was determined to be impractical to clean HDPE lined canals. However, recently new technology and features such as cleanout vaults could be available and allow the last 3.2 miles of canal to be lined and cleaned. Hence, the District may investigate lining the canal in the future.

Canal/Lateral (Reach)	*Type of Improvement*	*Number of Miles in Reach*	*Estimated Seepage (AF/Y)*	*Accomplished/ Planned Date*
None				

b) Construct/line regulatory reservoirs

The District currently has six regulating reservoirs for its pump station distribution system. The regulating reservoirs for pump stations #6, #8 and #10 serve as lift reservoirs for pump stations #7, #9, and #11, respectively. The reservoirs for pump stations #7, #9 and #11 serve as terminal reservoirs for each pump station. All pump station reservoirs provide a source of hydrostatic head for their respective service connections. While there is a need for increased water storage within the District, there is no identified need for regulatory reservoirs at this time.

Reservoir Name	*Location*	*Describe improved operational flexibility and AF savings*
No additional regulation reservoirs are needed or planned		

6. Increase flexibility in water ordering by, and delivery to, water users

Currently all water orders are made by phone, but the District plans to move to a fully online ordering system in the next five years. This will increase flexibility for the farmer and the District.

Copies of a sample water bill, annual water application, and water transfer form are included in **Appendix F.**

SLWD requires 24-hour notice by phone for any change in a water delivery (i.e., order, adjustment, or cancellation). The 24-hour requirement is a result of SLWD's need to provide 24-hour notice of water deliveries to the DWR and the SLDMWA. SLWD often accepts water delivery

changes from water users on less than 24-hour notice as long as the changes will not adversely impact operations of the DMC or SLC.

The District's operations are essentially on demand and water orders are not delayed due to capacity constraints in their infrastructure, even during peak demands. The District is as flexible as feasible with their current system. The District's 24-hour notice policy was established more as a guarantee that if a grower places their order 24 hours in advance they will get the water delivered. In comparison, some agencies operate on a rotation due to limited conveyance capacity, or are unwilling or unable to accommodate orders placed within 24 hours. SLWD provides the most flexible and rapid deliveries possible with their system.

7. Construct and operate District spill and tailwater recovery systems

Terminal reservoirs are located at the end of the Relift and Third Lift Canals, and each has pump-back facilities to return any operational spills to the canal. Due to the installation of flow control gates on the Relift Canal, virtually no water spills into the reservoir located at the end of this canal. This reservoir is only used for emergency spill situations. Improvements have also been made to the Third Lift Canal. As a result, virtually no water spills into the reservoir located at the end of this canal. If spills occur, the water is pumped back into the canal for delivery.

No operational spills occur from the pipeline distribution systems within SLWD.

Distribution System Lateral	*Annual Spill (AF/Y)*	*Quantity Recovered and reused (AF/Y)*
SLWD has 8 spill recovery reservoirs. These are rarely used due to automation improvements made to the irrigation system. Any water spilled is returned to the irrigation system.	0	
Total	0	

In theory, irrigation water could flow into Little Panoche Creek or Los Banos Creek. However, SLWD's Rule No. 18 (**Appendix D)** prohibits the discharge of tail water into district facilities. All tail water must be kept on-farm. (Note: Rule 18 was modified in 2005 to specifically prohibit any discharge of water to other lands or natural stream channels.)

Acres where tail water does drain into distribution system: None

Annual tail water collected (AF/Y): None

Acres where tail water is currently lost: None

Estimated potential additional tail water recovery (AF/Y): None
(Measure within 3 years.)

Drainage System Lateral	*Annual Drainage Outflow (AF/Y)*	*Quantity Recovered and reused (AF/Y)*
Total	700 (est.)	1,500 (est.)

8. Plan to measure outflow.

No water is known to flow out of the district except for an estimated 700 AF of drain water monitored and measured at three locations by Charleston Drainage District. A 30% design has been completed for a project to capture and reuse drain water.

Rule 18 of the District Rules and Regulations prohibits the discharge of such water from landowner's parcels. The California Regional Water Quality Control Board Irrigated Lands Monitoring Program monitors water quality of storm water run-off at four locations. Storm water flow is intermittent, occurring only during major local storm events.

Total # of outflow (surface) locations/points 0

Total # of outflow (subsurface) locations/points 3

Total # of measured outflow points 3

*Percentage of total outflow (volume) measured during report yea*r 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*
None	0	0	0	0	0

9. Optimize conjunctive use of surface and groundwater

SLWD is participating in groundwater recharge or banking projects. Groundwater resources and banking opportunities are extremely limited within the District's boundaries. The District participates in a regional groundwater bank to place some surplus water to recover in drier years.

Los Banos Creek Diversion Project. The District is collaborating with several other Districts to enhance groundwater recharge in the Los Banos Creek drainage area. A 30% Design has been completed with further planning and environmental work under way.

DMC Pump Back Program. SLWD has participated with the SLDMWA and other neighboring districts in the approval and implementation of annual programs to allow individual landowners to pump groundwater into the DMC for credit.

Myers Groundwater Bank. Meyers Family Farms has developed private groundwater banking facilities located outside SLWD. A primary purpose of the facilities is to provide a more secure water supply for the individual's orchards located within SLWD. The District assists by facilitating the water exchange with USBR so banked water can be returned to the District. The District currently has 5,000 acre-feet stored in this bank.

10. Automate distribution and/or drainage system structures

The entire SLWD irrigation system is automated. The system includes downstream level control and a SCADA system to assist with operations. No additional improvements are planned or needed at this time.

11. Facilitate or promote water customer pump testing and evaluation

Benefits from pump efficiency testing include identifying older, inefficient wells that need repair or replacing and identifying the most efficient wells to use first during groundwater pumping. This can ultimately lead to energy and cost savings. However, only 2-3% of farmers in the District have groundwater wells due to poor groundwater quality.

In the past pump efficiency testing was performed by the SLDMWA, but this program is no longer active. However, the SLWD website now points to a PG&E technical and financial assistance program for pump testing and other pumping efficiency studies and improvements. The program is administered through CSU Fresno. The program offers incentives for testing each deep wells (> 50 horsepower). This would cover part of the cost for a pump test.

12. Mapping

The District has geographic information system (GIS) maps of their distribution system and drainage system and intends to update maps as changes are made. Soils data is available from NRCS soils maps. The District does not own any wells and, but does keep track of existing wells as part of the Sustainable Groundwater Management Act. The District also has no natural or cultural resources. **Appendix B** includes copies of location and facility maps. Future work will be limited to updating maps with new information.

GIS maps	*Estimated cost (in $1,000s)*				
	2020	**2021**	**2022**	**2023**	**2024**
Layer 1 – Distribution system	0.2	2.5	0.5	0.5	2.5
Layer 2 – Drainage system					
Suggested layers:					
Layer 3 – Groundwater information	0.5	0.5	0.5	0.5	0.5
Layer 4 – Soils map					
Layer 5 – Natural & cultural resources					
Layer 6 – Problem areas					

C. Provide a 3-Year Budget for Implementing BMPs

1. Amount actually spent during current year.

SLWD does not track costs specifically related to water management for the BMPs. The costs below are estimates.

1. Projected budget summary for the Current year

Current Year BMP #	*BMP Name*	*Budgeted Expenditure (not including staff time)*	*Staff Hours*
A1	Measurement	$40,000	100
A2	Conservation staff	$0	40
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality Agricultural Education Program	$1,000 $500 $3,500 $0	25 20 10 20
A4	Quantity pricing	$0	20
A5	Contractor's pumps	$295,000	80
B1	Alternative land use	$0	20
B2	Urban recycled water use	$0	40
B3	Financing of on-farm improvements	$0	50
B4	Incentive pricing	$0	40
B5	Line or pipe canals/install reservoirs	$150,000	80
B6	Increase delivery flexibility	$0	20
B7	District spill/tailwater recovery systems	$0	10
B8	Measure outflow	$0	0
B9	Optimize conjunctive use	$438,750	80
B10	Automate canal structures	$0	20
B11	Customer pump testing	$0	25
B12	Mapping	$1,500	40
	Total	**$930,250**	**740**

Hours and costs are estimated

2. Projected budget summary for the 2nd year

Year 2 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$30,000	80
A2	Conservation staff	$0	40
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality	$1,000 $500 $2,500	25 20 10

Year 2 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
	Agricultural Education Program	$2,500	20
A4	Quantity pricing	$0	20
A5	Contractor's pumps	$150,000	80
B1	Alternative land use	$0	20
B2	Urban recycled water use	$0	40
B3	Financing of on-farm improvements	$0	50
B4	Incentive pricing	$0	40
B5	Line or pipe canals/install reservoirs	$0	60
B6	Increase delivery flexibility	$0	20
B7	District spill/tailwater recovery systems	$0	10
B8	Measure outflow	$0	0
B9	Optimize conjunctive use	$1,500,000	80
B10	Automate canal structures	$0	20
B11	Customer pump testing	$500	25
B12	Mapping	$2,500	20
	Total	**$1,689,500**	**680**

Hours and costs are estimated

3. Projected budget summary for the 3rd year

Year 3 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$30,000	80
A2	Conservation staff	$0	40
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality Agricultural Education Program	$1,000 $500 $2,500 $2,500	25 20 10 20
A4	Quantity pricing	$0	20
A5	Contractor's pumps	$150,000	80
B1	Alternative land use	$0	20
B2	Urban recycled water use	$0	40
B3	Financing of on-farm improvements	$0	50
B4	Incentive pricing	$0	40
B5	Line or pipe canals/install reservoirs	$1,500,000	80
B6	Increase delivery flexibility	$1,500,000	80
B7	District spill/tailwater recovery systems	$1,500,000	80
B8	Measure outflow	$0	0

Year 3 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
B9	Optimize conjunctive use	$0	0
B10	Automate canal structures	$0	20
B11	Customer pump testing	$500	25
B12	Mapping	$500	20
	Total	**$4,687,500**	**560**

Hours and costs are estimated

4. Projected budget summary for the 4th year

Year 4 BMP #	*BMP Name*	*Budgeted Expenditure (not including staff time)*	*Staff Hours*
A1	Measurement	$40,000	100
A2	Conservation staff	$0	40
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality Agricultural Education Program	$1,000 $500 $3,500 $0	25 20 10 20
A4	Quantity pricing	$0	20
A5	Contractor's pumps	$295,000	80
B1	Alternative land use	$0	20
B2	Urban recycled water use	$0	40
B3	Financing of on-farm improvements	$0	50
B4	Incentive pricing	$0	40
B5	Line or pipe canals/install reservoirs	$150,000	80
B6	Increase delivery flexibility	$0	20
B7	District spill/tailwater recovery systems	$0	10
B8	Measure outflow	$0	0
B9	Optimize conjunctive use	$438,750	80
B10	Automate canal structures	$0	20
B11	Customer pump testing	$0	25
B12	Mapping	$1,500	40
	Total	**$930,250**	**740**

Hours and costs are estimated

5. Projected budget summary for the 5th year

Year 5 BMP #	*BMP Name*	*Budgeted Expenditure (not including staff time)*	*Staff Hours*
A1	Measurement	$40,000	100

Year 5 BMP #	*BMP Name*	*Budgeted Expenditure (not including staff time)*	*Staff Hours*
A2	Conservation staff	$0	40
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality Agricultural Education Program	$1,000 $500 $3,500 $0	25 20 10 20
A4	Quantity pricing	$0	20
A5	Contractor's pumps	$295,000	80
B1	Alternative land use	$0	20
B2	Urban recycled water use	$0	40
B3	Financing of on-farm improvements	$0	50
B4	Incentive pricing	$0	40
B5	Line or pipe canals/install reservoirs	$150,000	80
B6	Increase delivery flexibility	$0	20
B7	District spill/tailwater recovery systems	$0	10
B8	Measure outflow	$0	0
B9	Optimize conjunctive use	$438,750	80
B10	Automate canal structures	$0	20
B11	Customer pump testing	$0	25
B12	Mapping	$1,500	40
	Total	**$930,250**	**740**

Hours and costs are estimated

Section IV: Best Management Practices for Urban Contractors

Following are the best management practices for the District's urban supply. The District provides both retail water to San Luis Hills and wholesale water to Santa Nella County Water District. Some of the BMPs below are not implemented or are implemented on a small scale due to the limited size or the urban water deliveries. This retail water system includes only 59 residential units, an RV Park and several commercial connections. The system used only 0.3% of the total water delivered in SLWD in 2020. As a result, implementing some BMPs are not economical or practical.

A. BMP COMPLIANCE METHODOLOGY

The San Luis Water District supplies urban water to the communities of San Luis Hills and Santa Nella. The District complies with the Urban Contractor BMPs through the GPCD (gallons/capita/day) method using foundational practices with a calculation of GPCD. The district has water conservation ordinances in place that allow for water to be better managed and conserved during dry years. The information below describes how that task is completed. In 2020, the residential household use was only 420 gallons per day. Population data for San Luis Hills is not available, however, assuming 3.5 people per household, the per capita use would only be 120 gallons/day, largely a result of conservation pricing described below.

B. FOUNDATIONAL BMPS

1. Operations Programs

1.1 Operations Practices

A.1) Conservation Coordinator

Name: Steven Stadler, P.E. Title: District Engineer
Address: PO Box 2135, Los Banos, CA 93635

Telephone: (209) 826-4043 E-mail: sstadler@slwd.net

Steven Stadler, P.E., the District Engineer, is the designated Conservation Coordinator. He is currently responsible for coordinating all District activities and goals discussed in the Water Management Plan. Specifically, the Conservation Coordinator assisted with planning new facilities, attending regular Board meetings, and implementing Best Management Practices for Urban Contractors. All these tasks further the goals and objectives in the USBR Best Management Practices Guidelines. Steven Stadler is currently designated to continue the role as the Conservation Coordinator. His responsibilities will include management and on-going evaluation of Urban BMPs, identifying new water conservation and water management programs, maintaining records on Urban BMPs including water supply statistics and expenditures, and preparing annual and five-year updates to the Water Management Plan. This is a part time position; the District Engineer has several other duties including implementing the agricultural BMPs in the District.

A.2) Water Waste Prevention

The purpose of water waste prevention is to ensure that the District's M&I water supply is put to beneficial use, that waste and unreasonable use of water is prevented, and to establish an

incremental water conservation plan in the case of severe drought/water shortage. Listed below are certain wasteful practices that have been prohibited in the District Rules and Regulations (Article II, Section 4):

Water Waste Prohibited: The following uses of water are prohibited at all times:

i Run Off - Use of water in a manner or to an extent that results in water running to waste down a sidewalk, gutter, storm drain, ditch, or across adjacent property
ii Plumbing Leaks - the escape of water through leaks, breaks, or other malfunction in the water users plumbing, distribution, or irrigation systems
iii Use of Open Hose - Use of a hose for any wash down not equipped with an automatic shut off nozzle.
iv Untended Hose - Irrigation of trees and shrubs with an untended hose
v Fire Hydrant - the use of any fire hydrant for purposes other than fire suppression without the express approval of the District

The limited quantity of extremely expensive water available to SLWD water users has virtually eliminated wasteful use and the need to exercise this authority.

A.3) Wholesale Agency Assistance Programs

The District provides wholesale water to the Santa Nella County Water District (Santa Nella). The water supplied only meets a portion of Santa Nella's water demands, so they also pump groundwater. SLWD does not provide wholesale assistance programs since Santa Nella already has a mature water conservation program.

1.2 Water Loss Control

Urban water losses are minimized and corrected in a timely manner using a fully metered system. Two sets of meters are used and regularly checked and maintained by the District. A meter is placed at the head of the system to calculate total urban flow and meters are placed at each delivery point to totalize water used. Any discrepancies between the sum of all delivery meters and the head meter indicate water losses and leaks are fixed.

1.3 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

All urban delivery points serviced by the district have two meters for domestic and landscape purposes. Each meter is priced with different commodity rates to encourage water conservation.

1.4 Retail Conservation Pricing

The District provides conservation pricing by charging for water volumetrically; hence water users have incentive to conserve water. San Luis Hills also has a dual pipe system with different pipes for treated indoor and raw outdoor water. These two water sources are priced differently, providing incentive for residents to conserve higher priced treated water.

Most importantly, the water rates are high compared to other urban systems, which is a result of water scarcity in the area, and high costs associated with operating a very small water treatment plant. In 2020, outdoor water costs were $195/AF and indoor water costs were $12,078/AF. These high costs provide a strong incentive to conserve water.

2. Information Programs

2.1 Public Information Programs – New residents are given a copy of the District Rules and Regulations (**Appendix D**) when they first move to ensure they are aware of the water conservation ordinance. The public is informed of drought conservation measure through letters sent by the District. A copy of an example letter declaring a drought can be found in **Attachment 2**.

2.2 School Education Programs - There are no schools within the District service area.

C. PROGRAMMATIC BMPS

3. Residential

The District does not offer residential assistance programs, landscape water surveys, high efficiency washing machine rebates, or high efficiency toilet rebates. Due to the size of the water system (59 residential connections) these types of programs are not efficient or cost effective. In addition, they are not considered necessary due to the impact of conservation pricing and metering.

The District does not have jurisdiction over development and plumbing specifications, such as WaterSense requirements for new developments. In addition, due to water scarcity, new development in San Luis Hills is not permitted to connect to the District's water system

Below are some sections of the District's Water Conservation Ordinance from the District Rules and Regulations that are pertinent to residential water use:

Penalties for Violation: Penalties for violation of any water conservation rule as provided in this Article 4 are as follows:

i. First violation - warning
ii. Second violation - $25 fine
iii. Third violation - $50 fine
iv. Fourth and all subsequent violations - $100 each

All fines are payable with the next water bill.

Water Shortage Stages:

Stage I Conservation Measures: Implemented when the District's CVP water supply allocation is 50% or below, and/or upon declaration of a Stage I shortage by the Board of Directors.

i. Washing exterior surfaces - the washing of sidewalks, fences, walls, driveways, buildings, tennis courts etc. is prohibited except where public health or safety would otherwise be compromised.
ii. Washing vehicles - the washing of cars, trucks, trailers, boats, machinery etc. is prohibited except with a bucket and hose with automatic shut off nozzle or at commercial wash facilities.
iii. Water use shall be reduced by 25%

Stage II Conservation Measures: Implemented when the District's CVP water supply allocation is 25% or below, and/or upon declaration of a Stage II shortage by the Board of Directors.

iv. Washing vehicles - the washing of cars, trucks, trailers, boats, machinery etc. is

prohibited except at commercial wash facilities.

v. Residential lawn watering is prohibited.
vi. Refilling swimming pools is prohibited except by water sources approved by the General Manager.
vii. Irrigation of trees and shrubs is prohibited except by handheld hose equipped with an automatic shut off valve.
viii. Irrigation of golf course fairways is prohibited.
ix. Water use shall be reduced by 40%.

4. Commercial, Industrial, and Institutional (CII)

Specific BMPs are not provided for CII customers. However, the water conservation measures from the Rules and Regulations related to water waste, drought declaration and fines and penalties (all described above) also apply to CII customers.

5. Landscape

The District's Rules and Regulation state the following:

Alternate Watering Days: Addresses ending in an even number may water landscaping only on Tuesdays, Thursdays, and Saturdays. Addresses ending in an odd number may water landscaping only on Wednesdays, Fridays, and Sundays

D. Provide a 5-Year Budget for Expenditures and Staff Effort for BMPs

SLWD does not track costs specifically related to water management for the BMPs. The costs below are estimates.

1. **Projected budget summary for current year**

Current Year BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utility Operations		
1.1	Operation Practices	$150,000	80
1.2	Water Loss Control	$15,000	240
1.3	Metering	$30,000	240
1.4	Retail Conservation Pricing	$2,500	96
2	Educational Programs		
2.1	Public Information Programs	$2,500	24
2.2	School Educational Programs	$0	0
3	Residential	$0	8
4	CII	$0	8
5	Landscape	$0	8
	Total	**$200,000**	**704**

2. **Projected budget summary for 2nd year**

Year 2 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utility Operations		
1.1	Operation Practices	$150,000	80
1.2	Water Loss Control	$15,000	240
1.3	Metering	$30,000	240
1.4	Retail Conservation Pricing	$2,500	96
2	Educational Programs		
2.1	Public Information Programs	$2,500	24
2.2	School Educational Programs	$0	0
3	Residential	$0	8
4	CII	$0	8
5	Landscape	$0	8
	Total	**$200,000**	**704**

3. **Projected budget summary for 3rd year**

Year 3 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utility Operations		
1.1	Operation Practices	$150,000	80
1.2	Water Loss Control	$15,000	240
1.3	Metering	$30,000	240
1.4	Retail Conservation Pricing	$2,500	96
2	Educational Programs		
2.1	Public Information Programs	$2,500	24
2.2	School Educational Programs	$0	0
3	Residential	$0	8
4	CII	$0	8
5	Landscape	$0	8
	Total	**$200,000**	**704**

4. **Projected budget summary for 4th year**

Year 4 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utility Operations		
1.1	Operation Practices	$150,000	80
1.2	Water Loss Control	$15,000	240

Year 4 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1.3	Metering	$30,000	240
1.4	Retail Conservation Pricing	$2,500	96
2	Educational Programs		
2.1	Public Information Programs	$2,500	24
2.2	School Educational Programs	$0	0
3	Residential	$0	8
4	CII	$0	8
5	Landscape	$0	8
	Total	**$200,000**	**704**

5. **Projected budget summary for 5th year**

Year 5 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utility Operations		
1.1	Operation Practices	$150,000	80
1.2	Water Loss Control	$15,000	240
1.3	Metering	$30,000	240
1.4	Retail Conservation Pricing	$2,500	96
2	Educational Programs		
2.1	Public Information Programs	$2,500	24
2.2	School Educational Programs	$0	0
3	Residential	$0	8
4	CII	$0	8
5	Landscape	$0	8
	Total	**$200,000**	**704**

Section V: District Water Inventory Tables

The District Water Inventory Tables are included in **Appendix G**.

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX A

ABBREVIATIONS

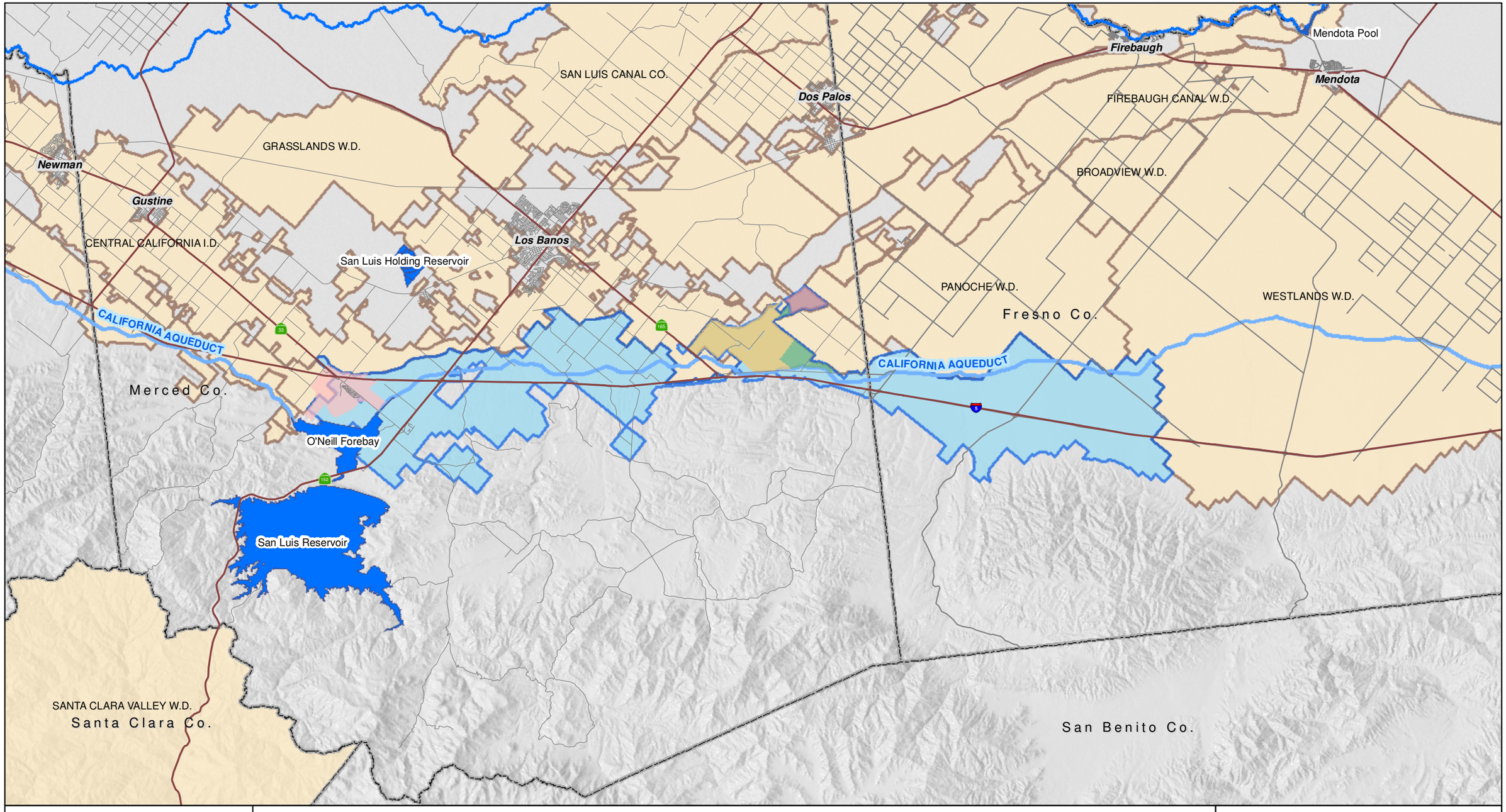
Abbreviation	Description
AF	acre-feet
BMP	Best Management Practice
CCID	Central California Irrigation District
CDD	Charleston Drainage District
CDFA	California Department of Food and Agriculture
CIMIS	California Irrigation Management Information System
CIT	Center for Irrigation Technology
CVP	Central Valley Project
District	San Luis Water District
DMC	Delta-Mendota Canal
DSA	Direct Service Area
DWR	California Department of Water Resources
EC	electrical conductivity
ESA	Endangered Species Act
ET	Evapotranspiration
GIS	geographic information system
GBD	Grassland Basin Drainers
GSP	Groundwater Sustainability Plan
ID	Improvement District
ITRC	Irrigation Training & Research Center
M&I	municipal and industrial
NRCS	Natural Resources Conservation Service
O&M	operations and maintenance
PacWD	Pacheco Water District
Reclamation	United States Department of Interior, Bureau of Reclamation
SCVWD	Santa Clara Valley Water District
SGMA	Sustainable Groundwater Management Act
SJRIP	San Joaquin River Improvement Program
SLDMWA	San Luis & Delta-Mendota Water Authority
SLC	San Luis Canal
SLWD	San Luis Water District
SNCWD	Santa Nella County Water District
TDS	total dissolved salts
USBR	United States Department of Interior, Bureau of Reclamation
USGS	United States Geologic Survey

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX B

DISTRICT LOCATION MAP, FACILITIES MAP AND SOILS INFORMATION



0 1 2 3 4 Miles

EST. 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

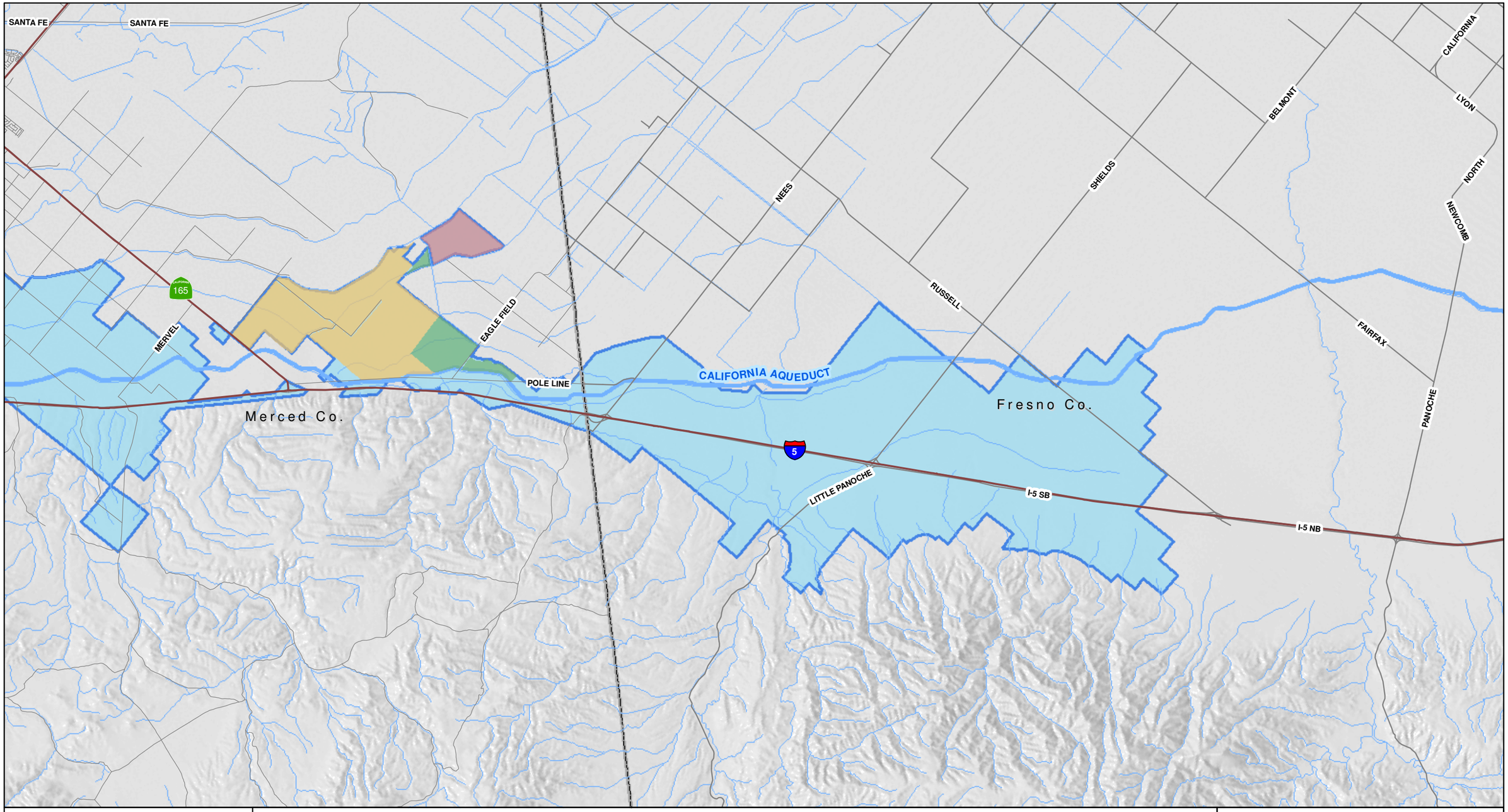
286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Legend

- San Luis Water District
- Federal Water Districts
- Santa Nella County Water District
- County Line
- Drained Through Charleston DD
- Drained Through Pacheco WD
- Drained Privately

San Luis Water District

Vicinity Map



0 1 2 Miles

EST. 1968
PROVOST & PRITCHARD
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An Employee Owned Company

286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

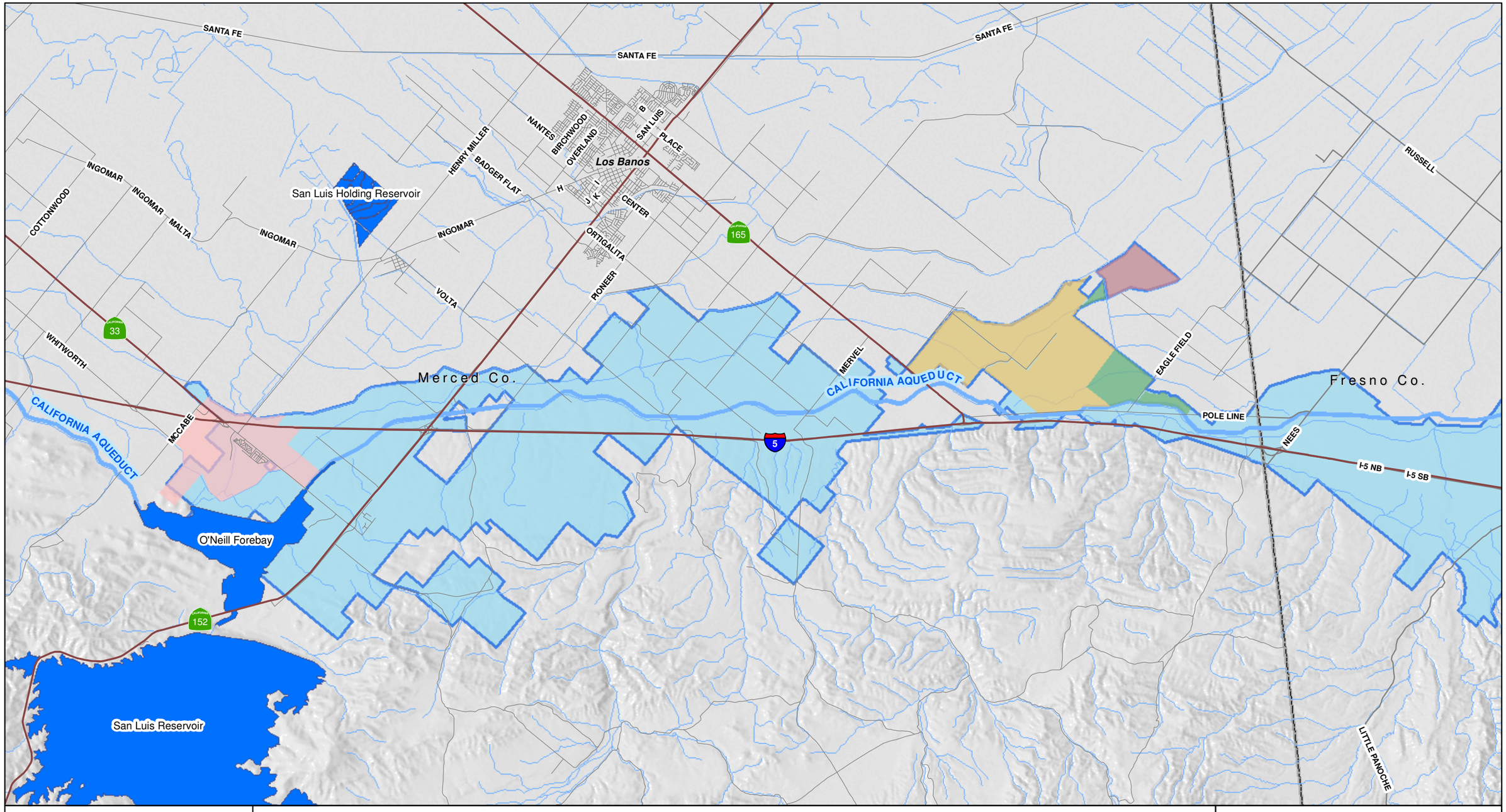
Legend

- San Luis Water District
- Santa Nella County Water District
- County Line
- Drained Through Charleston DD
- Drained Through Pacheco WD
- Drained Privately

San Luis Water District

Location Map

11/1/2010 \\pineflat\dwg_dgn\Clients\San Luis WD - 1493\149310C1-2010 Water Mgmt Plan\GIS\Map\SLWD_S.mxd



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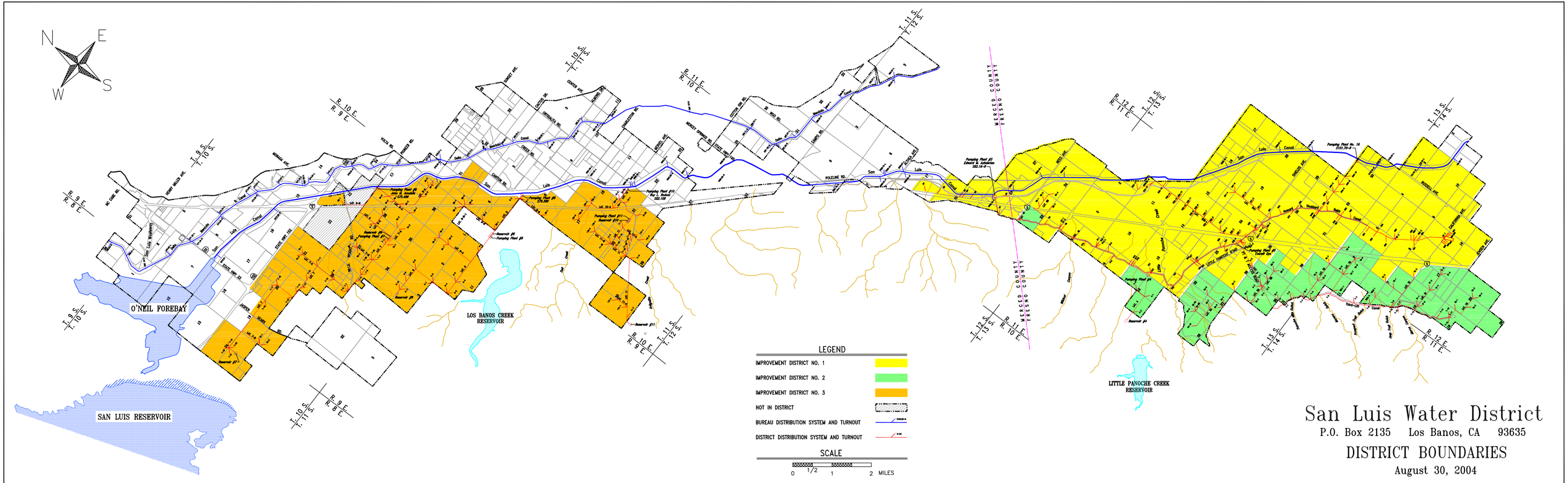
San Luis Water District

Location Map

11/1/2010 \\pineflat\dwg_dgn\Clients\San Luis WD - 1493\149310C1-2010 Water Mgmt Plan\GIS\Map\SLWD_N.mxd



San Luis Water District

P.O. Box 2135 Los Banos, CA 93635

DISTRICT BOUNDARIES

August 30, 2004

Soils Information

County	Map Unit	Description	Est. Acres
Fresno	107	Anela very gravelly sandy loam, 0-2% slopes	10
Fresno	285	Tranquility-Tranquillity, wet, complex, saline-sodic, 0-1% slopes	228
Fresno	352	Not available	8
Fresno	405	Polvadero-Guijarral complex, 5-15% slopes	28
Fresno	438	Panoche loam, 2-5% slopes	3,304
Fresno	442	Panoche clay loam, 0-2% slopes	2,740
Fresno	445	Excelsior sandy loam, 0-2% slopes	24
Fresno	447	Excelsior sandy loam, sandy substratum, 0-2% slopes	136
Fresno	452	Milham sandy loam, 2-5% slopes	1,344
Fresno	453	Milham sandy loam, 5-9% slopes	66
Fresno	459	Ciervo clay, 0-2% slopes	4,260
Fresno	466	Paver clay loam, 0-2% slopes	3,384
Fresno	474	Westhaven loam, 0-2% slopes	32
Fresno	479	Cerini clay loam, 0-2% slopes	4,700
Fresno	481	Cerini clay loam, 2-5% slopes	2,430
Fresno	588	Mugatu fine sandy loam, 5-30 % slopes	4
Fresno	590	Cerini-Anela-Fluvaquents, saline sodic association, 0-5% slopes	24
Fresno	723	Exclose-Wisflat-Grazer association, 15-65% slopes	76
Fresno	741	Anela-Vernalis association, 0-5% slopes	10
Fresno	851	Los Banos clay loam, 0-2% slopes	1,046
Fresno	853	Los Banos-Pleito complex, 2-8% slopes	2,844
Fresno	855	Pleito gravelly clay loam, 15-30% slopes	142
Fresno	863	Vernalis loam, 0-2% slopes	10
Fresno	950	Pits, gravel	46
Fresno	959	Not available	104
Fresno	960	Excelsior, sandy substratum-Westhaven assoc., flooded, 0-2% slopes	24
Merced	102	Akad-Conosta association, 30-50% slopes	16
Merced	106	Anela gravelly loam, 0-2% slopes	372
Merced	107	Anela very gravelly sandy loam, 2-8% slopes	24
Merced	108	Anela very gravelly sandy loam, 8-15% slopes	12
Merced	109	Apollo clay loam, 2-8% slopes	2,984
Merced	110	Apollo clay loam, 8-15% slopes	1,058
Merced	111	Apollo clay loam, 15-30% slopes	534
Merced	116	Arbuckle Variant sandy loam	98
Merced	117	Arburua loam, 2-8% slopes	372
Merced	118	Arburua loam, 8-15% slopes	100
Merced	119	Arburua loam, 15-30% slopes	314
Merced	120	Arburua loam, 30-50% slopes	4
Merced	123	Ayar clay, 5-8% slopes	72
Merced	124	Ayar clay, 8-15% slopes	50
Merced	125	Ayar clay, 15-30% slopes	12
Merced	126	Ayar clay, 30-50% slopes	138
Merced	128	Ayar-Arburua complex, 15-30% slopes	196
Merced	131	Ballvar loam, 2-8% slopes	614
Merced	133	Bapos sandy clay loam, 0-2% slopes	1,144
Merced	145	Capay clay	234

County	Map Unit	Description	Est. Acres
Merced	147	Carranza gravelly clay loam, 2-8% slopes	56
Merced	148	Carranza-Woo complex, 0-2% slopes	1,488
Merced	149	Chaqua loam, 2-8% slopes	210
Merced	150	Chateau clay, partially drained	124
Merced	151	Chateau clay, ponded	46
Merced	156	Conosta clay loam, 8-15% slopes	284
Merced	161	Damluis clay loam, 0-2% slopes	1,602
Merced	162	Damluis clay loam, 2-8% slopes	2,790
Merced	163	Damluis gravelly clay loam, 0-2% slopes	68
Merced	165	Damluis gravelly clay loam, 8-15% slopes	166
Merced	166	Damluis Variant clay loam	624
Merced	167	Deldota clay, partially drained	1,726
Merced	169	Dosamigos clay, partially drained	1,220
Merced	200	Kesterson loam, ponded	30
Merced	206	Los Banos clay loam, 0-2% slopes	140
Merced	207	Los Banos clay loam, 2-8% slopes	3,528
Merced	208	Los Banos clay loam, 8-15% slopes	570
Merced	209	Los Banos-Pleito clay loams, 2-8% slopes	324
Merced	220	Mollic Xerofluvents, channeled	200
Merced	221	Oneil silt loam, 8-15% slopes	140
Merced	222	Oneil silt loam, 15-30% slopes	768
Merced	223	Oneil silt loam, 30-50% slopes	784
Merced	225	Oquin fine sandy loam, 15-30% slopes	74
Merced	229	Paver clay loam, 0-2% slopes	990
Merced	230	Paver clay loam, 2-5% slopes	384
Merced	238	Pits	332
Merced	239	Pleito gravelly clay loam, 8-15% slopes	408
Merced	240	Pleito gravelly clay loam, 15-30% slopes	214
Merced	249	San Timoteo sandy loam, 2-8% slopes	12
Merced	250	San Timoteo-Wisflat sandy loams complex, 8-15% slopes	96
Merced	251	San Timoteo-Wisflat sandy loams complex, 15-30% slopes	22
Merced	253	Stanislaus clay loam	900
Merced	263	Vernalis loam, 2-5% slopes	2
Merced	271	Wisflat-Rock outcrop-Arburua complex, 30-50% slopes	70
Merced	272	Wisflat-Rock outcrop-Arburua complex, 50-75% slopes	20
Merced	273	Wisflat-Rock outcrop-Oneil complex, 30-50% slopes	118
Merced	276	Woo sandy clay loam, 0-2% slopes	558
Merced	277	Woo clay loam, 0-2% slopes	3,274
Merced	278	Woo clay loam, 2-5% slopes	138
Merced	280	Woo clay, 0-2% slopes	2,796
Merced	281	Woo-Anela-Urban land complex, 0-2% slopes	214
Merced	284	Xerofluvents, extremely gravelly	700
Merced	286	Yokut loam	4

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX C

WATER SERVICE CONTRACTS

Current and Prior Water Service Contracts with U.S. Bureau of Reclamation

Date	Contract No.	Term (years)	Quantity (ac-ft)	Water Type	Notes
February 25, 1959	14-06-200-7563	36	93,300	---	1
June 18, 1974	14-06-200-7773A	34	128,000	Ag and M&I	
January 13, 1986	14-06-200-7773A	---	---	Ag and M&I	2
September 30, 1997	14-06-200-7773A-BA	---	---	---	3
January 1, 2009	14-06-200-7773A-IR1	2	125,080	Ag and M&I	4
February 28, 2011	14-06-200-7773A-IR2	2	125,080	Ag and M&I	4
February 28, 20131	14-06-200-7773A-IR3	2	125,080	Ag and M&I	4
February 28, 2015	14-06-200-7773A-IR4	2	125,080	Ag and M&I	4
February 28, 2017	14-06-200-7773A-IR5	2	125,080	Ag and M&I	4
February 28, 2019	14-06-200-7773A-IR6	2	125,080	Ag and M&I	4
December 28, 2020	14-06-200-7773A-IR1-P	∞	125,080	Ag and M&I	5

Notes:

1 Initial water service contract.

2 Amendatory contract modifying Article 1 of the long-term contract by changing the definition of "year".

3 Binding agreement regarding early renewal of the long-term contract as provided for in Section 3040(c)(3) of the Central Valley Project Improvement Act (CVPIA).

4 Interim renewal contract.

5 Conversion of the existing contract to a permanent contract pursuant to Section 4011 of the Water Infrastructure Improvements for the Nation (WIIN) Act.

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX D

SAN LUIS WATER DISTRICT RULES AND REGULATIONS

AMENDED AND RESTATED
RULES AND REGULATIONS GOVERNING
THE USE AND DISTRIBUTION
OF WATER IN THE
SAN LUIS WATER DISTRICT
AND RATES AND TOLLS
AND CHARGES
FOR THE USE THEREOF

Table of Contents

Article I

Article II

ARTICLE I

These rules and regulations are adopted pursuant to Section 35423 of the Water Code of the State of California to effect orderly, efficient and equitable distribution and use of water. All rules and regulations heretofore adopted are hereby repealed and superseded by these rules and regulations.

It is not the intent in formulating rules and regulations governing the distribution and use of water to arbitrarily impose unreasonable restrictions on water users. One purpose of the rules and regulations is to permit the water to be handled in an orderly way so that water users can be served with some regularity and receive equal treatment in that regard. No rules and regulations can be enforced without the cooperation of the water users. We therefore request your cooperation in this, to the end that water users may receive equal treatment in the matter of water service. The benefits the landowners and water users derive from the District will be measured by the extent to which they cooperate to make it a success. It is the express intent of the District to apply these rules and regulations uniformly throughout the District.

Rule No. 1 - Control of Works

The maintenance and operation of irrigation and domestic water supply, conveyance, distribution, treatment and works of the District or any Improvement District within the District shall be under the exclusive management and control of the General Manager appointed by the Board of Directors. No other person except District employees designated by him for the purpose shall have any right to interfere with said canals and works in any manner, except in the case of an order from the Board of Directors.

Rule No. 2 - Installation of Gates

No gate, takeout, siphon or other structures or device shall be installed or placed in any canal, ditch or conduit belonging to the District except in the pursuance of plans adopting or orders made by the Board of Directors, nor shall any person divert or take water from any canal, ditch or conduit belonging to the District or under its control, or make any opening therein, or change, molest, disturb or interfere with any gate, takeout or other structure or device in any such canal, ditch or conduit without permission of the System Operator in charge thereof or the General Manager.

Rule No. 3 - Use of Facilities

Water users shall not permit their livestock to feed or trespass upon the rights-of-way of the District owned canals or ditches, except with specific permission of the General Manager. In cases where it is necessary to cross the rights-of-ways, permission to use the rights-of-way for that purpose must be obtained from the General Manager in advance. Any damage done to canal or ditch banks by water users in using them for a roadway, whether moving livestock, farming equipment for other vehicles, shall be the responsibility of those making such use of the property. If it is found necessary for the District to repair such damage, those responsible therefore shall pay all costs of such repairs.

Rule No. 4 - Private Ditches and Pipelines

All private ditches and pipelines shall be maintained and kept clean by the users thereof at no cost to the District and shall be of sufficient size to carry the irrigation head ordered. In case any ditch or pipeline is found not to be in accordance with this rule, the water shall not be turned into it until this rule is complied with.

Where private ditches or pipelines must be constructed or enlarged to carry water from existing District canals to land to be served, the landowner or user requesting water must provide the right-of-way and

construct or enlarge at no cost to the District a service ditch or pipeline from said land to a District canal designated by the General Manager.

Landowners shall construct and maintain adequate drainage facilities so that adjacent or lower lying lands will not be damaged and no irrigator shall be delivered, in the opinion of the General Manager, a greater amount of water than can economically and beneficially be used without waste and with due regard to the needs of other irrigators.

No landowner shall construct or permit the use of any private facility which provides District water for domestic uses, including without limitation drinking or cooking, without the express prior written consent of the District and compliance with all applicable laws. If the District learns that a landowner has constructed or permitted the use of a private facility which provides District water for domestic uses, the District may immediately terminate any or all water service to such landowner.

The District shall have control of all diversion gates and weirs in private ditches and pipelines to such an extent as may be necessary to enforce the delivery or non-delivery of water in accordance with these rules and regulations, but the District shall not thereby assume or incur any liability for the maintenance or repair of such gates and weirs. Only District employees or persons delegated by them shall have authority to open such diversion gates and they shall have full authority to close such gates as soon as the proper amount of water for each irrigation has been discharged. The District is empowered to place its own locks on such gates, if, in the opinion of the General Manager, it is advisable to do so. If such gates are equipped with locks, the General Manager shall be provided with a key to such locks and, if he is not, then the District may take such action as necessary with regard to the lock in order to make or prevent the delivery.

Rule No. 5 - Distribution of Water

In accordance with the water service contract with the United States Bureau of Reclamation, irrigation water can only be delivered to non-excess lands, lands subject to a recordable contract, or lands that are otherwise eligible to receive irrigation water under Federal Reclamation law. Irrigation water will not be allocated to ineligible land.

Rule No. 6 - Water Allocations

Under the terms and provisions of the Water Service Contract between the San Luis Water District and the United States of America, dated June 18, 1974, and as amended by letter agreement on January 13, 1976, the District has an entitlement for an annual supply of 125,080 acre-feet of Central Valley Project water. This supply is dependent upon the delivery of such water by the Bureau of Reclamation to the District, and is subject to shortages imposed by the Bureau of Reclamation.

The Bureau shall notify the District each year concerning the total amount of the District's contractual firm supply available. The Bureau may specify a quantity for agricultural use and a quantity for M&I use.

The Board of Directors shall determine on an annual basis the quantity of water to be set aside from the Bureau allocation for distribution system losses. The water set aside shall be maintained in a separate account under the District's name. Improvement Districts shall purchase water from this account for losses incurred by their distribution systems. In the event system losses exceed the quantity of water set aside, the set aside water shall be apportioned among Improvement Districts on a pro-rata basis based on distribution system losses. Each Improvement District will be responsible for purchasing other water to make up any difference between actual losses and their portion of the water set aside by the Board of Directors.

The District will allocate the remaining Bureau allocation to eligible parcels on a pro-rata acreage basis. The remaining Bureau allocation may be divided into specific quantities of agricultural and M&I water and eligible parcels may be designated to receive either agricultural or M&I allocation. A parcel is eligible if it is subject to the District's Standby Charge, if the Water Deposit Billing has been paid, and if the landowner has filed a Water Application with the District. The Board of Directors shall annually approve the Water Application form and the District will mail such form with the Water Deposit Billing. The Board of Directors shall also annually fix the charge per acre for the Water Deposit Billing. If necessary, the Board of Directors shall specify the quantities of agricultural and M&I water and establish the criteria for designating eligible parcels as either agricultural or M&I.

Once allocated, water shall remain with the landowner (as shown on the last equalized assessment roll or a subsequent purchaser whom the District reasonably believes to be the current owner of the land) at the time the allocation is made, or the recipient of a transfer from such landowner made pursuant to Rule 7, signed by such landowner and received by the District. In the event that a lease is terminated or ownership changes hands during a water year but after the allocation has been made, the new tenant or the person claiming to be the new owner shall have no claim to water previously allocated to such property for that water year unless a transfer has been completed pursuant to Rule 7, signed by the landowner at the time of the allocation and received by the District.

When through lack of water, lack of canal capacity or for any other reason it is not possible for the District to deliver all or any portion of the full supply of water allocated pursuant to the procedures set forth in this Rule No. 6, such supply as can be delivered will be equitably prorated until such time as a delivery of a full supply can be made.

Rule No. 7 – Water Transfers and Relinquishment of Entitlement

All proposed water transfers and implementation of all water transfers must be approved and managed by the District. The District must be a contracting party to all water transfers unless the District determines that it does not need to be a party to the water transfer or the water transfer is subject to an exception to this requirement. Other than water transfers to which the District, itself, is a party, no water may be transferred into, within or out of this District except as set forth in this Rule. For the purposes of interpreting this Rule, all water is either allocated, Individually Acquired or Supplemental Water and all water transfers are either Annual or Multi-year Transfers.

A. Definitions:

The following definitions shall apply to this Rule:

1. **Annual Transfer**: An Annual Transfer is for the period of one water year or less.

2. **Multi-year Transfer**: A Multi-year Transfer is for a period of more than one water year but not more than five years.

3. **Allocated Water**: Water allocated by the District as a result of the District's water supply contract with the Bureau of Reclamation.

4. **Individually Acquired Water**: Water directly attributable to a specific water user acquired from some source outside of the District. Water transferred to the District for a particular water user or water which is pumped into the Delta-Mendota Canal or the San Luis Canal for the credit of an individual water user are examples of Individually Acquired Water.

5. **Supplemental Water**: Water acquired by the District and made available to water users within the District.

B. Collection of Charges on Transferred Water:

Water transferred into the District will not be added to a water user's account until all costs associated with that water owed to the District, exclusive of the Water Delivery Charges, are paid in full. Neither Allocated, Individually Acquired, nor Supplemental Water may be transferred either within or out of the District so long as any charges attributable to the water are delinquent. Charges on water transferred within or outside the District will be established annually as part of the District's budgeting process and may be modified during the course of the water year by Board action.

C. Consent Required For and Prohibited Transfers:

Any water transfer requires the approval of at least the General Manager as provided for hereunder. All other water transfers require the approval of or rejection by the Board of Directors. Consecutive Annual Transfers or Multi-Year Transfers may be prohibited at any time.

1. **Supplemental Water**: Transfer of Supplemental Water is allowed within and outside the District as an Annual Transfer as long as the water user has complied with the following requirements: (i) completed all necessary environmental permitting and regulatory approvals for transfer; and (ii) obtained the written consent of the General Manager ensuring that the transfer does not conflict with the District's management of its Supplemental Water.

2. **Annual Transfers**: All annual transfers of Allocated Water or Individually Acquired Water, into, within or out of the District require the General Manager's consent, subject to Board reversal. An annual transfer of Allocated Water outside the District is allowed if it is transferred for use on land owned by the same landowner making the transfer to another federal CVP district.

3. **Multi-year Transfers**: The Multi-year Transfer of Allocated Water within the District is not allowed unless the Multi-year Transfer of Allocated Water is with the District. The Multi-year Transfer of Individually Acquired Water either into, within or out of the District is

allowed with the consent of the Board of Directors subject to approved permitting. The Multi-year Transfer of Allocated Water out of the District is not allowed.

4. **Transfers** of Allocated Water, Individually Acquired Water or Supplemental Water: All water transfers that have a term as an Annual Transfers or Multi-Year Transfers and are of or include either Allocated Water or Individually Acquired Water shall only be conducted between the landowner and the District. The transfer of Supplemental Water is not allowed except as an Annual Transfer or Multi-Year Transfer.

D. Relinquishment Of Water Allocation To The District:

A water allocation may be permanently relinquished (i) to the District, or to one or more parcels owned by the District, for the purpose of relieving the transferring parcel of the obligation of the District's standby charge or (ii) to the District for the purpose of conveying the sole management and control over such allocation to the District on terms and conditions approved by the Board at the time of such relinquishment.

1. A relinquishment that the Board determines at the time it accepts the conveyance is for the purpose of relieving the obligation of the District's standby charge shall relieve the land of the transferor of any obligation to pay standby charges to the District, but not of any obligation to pay fees or charges imposed by an Improvement District, including but not limited to Improvement District standby charges, if any. The Board of Directors of the District will consider accepting the relinquishment of such a water allocation if and only if adequate provisions are made by the conveying owner for the payment or other satisfaction of all charges associated with the water, (other than standby charges payable to the District,) including but not limited to Improvement District charges, if any.

2. The Board of the District may, in its sole discretion, consider accepting a relinquishment of a water allocation for the purpose of conveying management and control over the water allocation upon application from a landowner. Any such water allocation managed by the District shall be administered by the District separate and apart from any other water allocations pursuant to the District's applicable policy and in accordance with the applicable agreement between the District and the transferring landowner, which agreement shall include such terms and conditions as the Board in its sole discretion determines to be appropriate at the time of the conveyance. The District is not prohibited from selling water derived from the conveyed allocation to purchasers inside or outside of the District at rates determined by the Board in its sole discretion.

Rule No. 8 - Description of Charges and Billing Procedures

Charges will be classified as either, Water Allocation Charges, Water Delivery Charges, or Standby And Assessment Charges.

A. A Water Allocation Deposit Billing will be sent to landowners specifying eligible parcels subject to the District's Standby Charge, the deposit price per acre for each parcel, and the date by which payment must be made. Failure to make payment by the specified date will result in the loss of a water allocation for that year but will not affect future years' allocations.

The Water Allocation Billing(s) will be sent to landowners who have submitted a valid Water Application, paid their Water Allocation Deposit, and met all other legal requirements the District's Board has imposed for this purpose, in a timely manner. The Water Allocation Billing shall identify the parcels subject to the District's Standby Charge, the quantity of water allocated to each parcel, the per acre-foot water rate applicable to each parcel, and a subtotal of the cost per parcel less any offsetting applicable credit including the Water Allocation Deposit previously paid. The resulting balance due must be paid by the due date indicated on the Allocation Billing; otherwise, water service to the delinquent parcel(s) will be suspended until full payment of the outstanding balance, including a 5% penalty on the outstanding amount, is received. Additionally any unpaid balance will accrue interest at a rate of 1.5% per month.

The Board of Directors shall, at least annually, establish the amount of the Water Allocation Deposit and the Water Allocation Charge. In determining these amounts, the Board shall consider the schedule of rates established by the Bureau of Reclamation for both the Delta-Mendota Canal and the San Luis Canal.

B. Water Delivery Charges are charges which become due when the water is transferred to another district or is otherwise delivered. They will be billed on a monthly basis to a water user, beginning as soon as possible after the end of the month in which the delivery is made. If they are not paid they become delinquent on the 10th of the month following billing. Interest on the unpaid balance will accrue at a rate of 1.5% per month beginning the tenth of the month following billing. Water service will be suspended for any water user that has delinquent Water Delivery Charges.

The Board of Directors shall annually establish Water Delivery Charges.

Water users that have filed bankruptcy with the District will be required to pay Water Delivery Charges prior to the delivery of water.

All unpaid Water Delivery Charges are a lien on the land upon which the water was used. Amounts which are unpaid prior to the completion of the next assessment role, together with the penalty and/or interest, as applicable, will be added to and become a part of the annual assessment levied against the land. Water service to said land and the applicable water user shall be discontinued until the same inclusive of penalties and interest shall be paid in full.

C. Standby charges and assessments are due and payable on April 1st of each year and will be billed in a timely manner by the District before that date, and may be paid in two equal installments, the first of which shall be delinquent if not paid on or before September 1, and the second installment shall be delinquent if not paid on or before January 1, of each year. Upon delinquency, a penalty of 5 percent of such charges shall be added thereto.

Water service on lands upon which standby charges or assessments are delinquent as of January 2, of each year, shall be discontinued until the same inclusive of all penalties shall be paid in full.

D. All unpaid Water Allocation Charges are a lien on the land to which the water was allocated. Amounts which are unpaid prior to the completion of the next assessment roll, together with penalty and/or interest, as applicable, will be added to and become a part of the annual assessment levied against the land. Water service to said land shall be discontinued until the same inclusive of penalties and interest shall be paid in full.

E. Water users or lands with unresolved delinquent charges shall not be eligible for any service or program administered by the District including but not limited to water transfers, water deliveries, water rescheduling, loans and grants, until all delinquencies, inclusive of penalties, are paid in full

Rule No. 9 - Water Orders

The District office must be notified of any change in water delivery by 10:00 a.m. of any working day preceding such change. However, the District reserves the right to reject or modify a water order if, in the opinion of the General Manager, such water order would create an undue hardship on District operations.

Rule No. 10 - Rescheduling Water

The Bureau will determine on an annual basis if rescheduling will be allowed. If so, the Bureau will determine general conditions for rescheduling such as eligible water, the rescheduling period, cost, and losses.

The District will schedule water prior to March 1 so as to maximize the amount of eligible water. The District will schedule water during the rescheduling period so as to maximize usage of rescheduled water.

The District will not reschedule water from a previous year. Water from the current year will be rescheduled upon receipt of a written request from a water user. The District will annually establish the form of the written request and determine the date by which such requests must be received. If allowed by the Bureau, water that is not rescheduled will be returned for credit.

Rescheduled water from another district will be allowed to be transferred in during the rescheduling period. Transfers in of other types of water will not be allowed during the rescheduling period unless all rescheduled water and transfers in of rescheduled water have been scheduled as delivered.

If the amount of eligible water delivered to the District during the rescheduling period equals or exceeds the amount of rescheduled water plus transfers in, all rescheduled water will be protected and water users will have the entire water year to use their rescheduled water.

If the amount of eligible water delivered to the District during the rescheduling period is less than the amount of rescheduled water plus transfers in, then a portion of the rescheduled water will be lost. The following is an example of the process that will be used to determine how this loss will be allocated among water users:

A. The District will calculate the following for each water user during the rescheduling period:

Usage + transfers of rescheduled water to another water user or district - rescheduled water - transfers of rescheduled water from another water user or district

B. A water user will not lose any water if the result of this calculation positive.

C. The sum of all positive balances plus water losses within the District during the rescheduling period will be used first to protect general district water supplies.

D. Any remaining quantity will be allocated on a pro-rata basis among all water users with a negative balance.

E. Any water user that has a remaining negative balance will lose a like quantity of water.

Water users losing water will still be responsible for payment of all rescheduling or transfer costs associated with the lost water.

Following are definitions for the terms used in Rule No. 10:

Eligible water - water that is eligible for rescheduling as defined by the Bureau

Remaining water - unused water at the end of a water year

Reschedule - the process of transferring eligible water from one water year into the next

Rescheduled water - eligible water desired to be rescheduled minus losses as determined by the Bureau

Rescheduling period - the period during which rescheduled water may be used as defined by the Bureau

Schedule - the process of identifying for the Bureau the types and quantities of water delivered during a given period

Rule No. 11 – Supplemental Water

The District may, at the discretion of the Board and depending upon availability and price, acquire water in addition to the normal allocation from the Bureau. If the District does secure such an additional supply it will be equitably distributed based on the principals set forth in this Rule No. 11. Such water is referred to hereinafter, (and elsewhere in these Rules,) as "Supplemental Water"

A. **Application for Supplemental Water** – In order to avoid situation in which the District acquires water in addition to the normal allocation from the Bureau, which the water users in the District did not utilize (and for which the District is required to pay), the District will provide such water pursuant to the following requirements:

1. Content of Form – At least annually, the Board shall adopt a form Application for Supplemental Water. This form is not to be confused with the Water Application form described in Rule No. 6, which is mailed with the Water Deposit Billing and which is for use in the annual allocation of the District's water supplied by the Bureau of Reclamation. The Application for Supplemental

Water shall set forth the quantity of Supplemental Water desired by the applicant, the maximum price per acre-foot the applicant is willing to pay and the parcel/s of land the applicant pledges as payment surety. At a minimum, the pledge shall include all lands to which the Supplemental Water will be applied or other lands and/or deposit adequate to provide payment surety.

2. Eligibility – Any landowner or tenant can apply for a supply of Supplemental Water. In order for an application to be considered for any particular allocation, the applicant must be otherwise eligible to receive water from the District, including but not limited to having no delinquent accounts with the District. An Application for Supplemental Water will not be placed on file unless it is fully completed, signed by the applicant, and accompanied by the required deposit. All completed forms on file with the District shall be considered public records as shall any revisions and/or modifications thereof.

3. Deposit – At the time each year that the Board adopts the form Application for Supplemental Water, the Board will determine the initial amount of a deposit per acre-foot that must accompany each application. The amount of the deposit may be changed by the Board during the course of the year depending upon the price of the water available to the District. If the General Manager, in his sole discretion, determines that an applicant cannot pledge adequate land to provide payment surety, the General Manager may require a larger deposit, up to and including the full amount of the purchase price.

4. Withdrawal – At any time during the course of the year any applicant may, upon written request, withdraw an application. Withdrawal of an application is without prejudice as to filing a new application for Supplemental Water during that same year.

5. Revision – At any time during the course of the year any applicant may, upon written request, revise a previously submitted application. A revision that increases the requested quantity will require an additional deposit. The deposit associated with any decreased quantity may be returned to the applicant at the end of the water year subject to the provisions of A.6 below. Revisions will become effective upon receipt by the District of a fully completed Application for Supplemental Water and, if necessary, payment of an additional deposit. No revision of an Application for Supplemental Water shall affect any previous allocations of Supplemental Water made prior to the effective date of the revision.

6. Refund of Deposit – In the event an applicant requests withdrawal of an application pursuant to A.4 above, or a decreased request pursuant to A.5 above, the deposit associated with that request will be refunded at the end of the water year, or can be applied to a subsequent Supplemental Water request provided one or more of the following conditions has been satisfied:

    a. Supplemental Water has not been acquired by the District for the water year in which the application was filed.
    b. Unfilled requests for Supplemental Water exceed the total amount of the Withdrawal or Revision requested by the applicant.

c. One or more eligible water users submit a written application to replace the position and obligations of the user requesting Withdrawal or Revision of the original Supplemental Water application.

Unless one or more of the preceding conditions have been satisfied, the application cannot be Withdrawn or Revised nor will any portion of the deposit be refunded. In such cases, the applicant will be charged the full cost of Supplemental Water.

B. **Allocation of Supplemental Water** – At least once each year, the Board will determine the quantity of Supplemental Water available and the price of this water. The District will allocate the Supplemental Water based on the information contained on the Applications for Supplemental Water. In the event Supplemental Water acquired by the District is less than the total requested, the available Supplemental Water shall be proportionately allocated based on the amount of land owned and/or leased by each applicant. Different allocations of Supplemental Water may take place during the year and each such allocation may have a different price.

C. **Payment for Supplemental Water** – Supplemental Water will not be allocated to an applicant's account until the District has been paid the difference between the total cost of the Supplemental Water supply allocated to them and the deposit associated with the quantity of water allocated for that particular allocation. If not paid by the due date, (1) the Supplemental Water allocation will be lost, (2) the application will be considered invalid, (3) the applicant's account will be considered delinquent pursuant to Section 8 of these Rules and Regulations, and (4) in the event the District is unable to re-market the water allocated to the applicant for at least the same price applicant agreed to pay, then the applicant will be responsible for the difference between the price he/she agreed to pay and the cost of the re-marketed water. The Supplemental Water which is made available due to the applicant's failure to pay the invoice in a timely manner, shall be offered on a pro-rata basis to the other applicants who shared in the original allocation of that water for the same price as it was originally offered. All unpaid Supplemental Water allocation charges are a lien on the land pledged as payment surety and shall be treated as unpaid Water Allocation Charges pursuant to Section 8. D. of these Rules and Regulations.

D. **Surplus Supplemental Water** – If Supplemental Water is available and the demand from all applicants willing to pay the price of the available Supplemental Water has been met, then the Supplemental Water will be sold on a first-come-first-serve basis at a price established by the Board.

E. **Establishment of an Incidental Supplemental Pool** – Annually the General Manger shall establish an Incidental Pool of Supplemental Water not to exceed 50 acre ft at any one time. Such water shall be used to service small unanticipated demands such as those that might occur for construction water, stock water, accidental excess usage or other such unanticipated events. All allocations from the Incidental Pool shall be at the discretion of the General Manager. Such allocations shall not exceed 5 acre ft each and shall be charged at the highest Supplemental Water rate the District has charged during the previous twelve months. The Incidental Pool shall not be used to cover routine demands that should have been anticipated prior to Water Supply Allocation or the Supplemental Water Application.

Rule No. 12 – Over-Usage of Water

All water delivered by the District is measured by meters, which are available to the user of that water to read. All water users are sent monthly statements of how much water they are entitled to use, which has not yet been consumed. It is the responsibility of the water user to use no more than the water to which he is entitled. In the event that a water user uses more water than the water to which he is legally entitled, the water user is guilty of "over-usage" and shall be subject to the terms of this rule:

A. **Over-Usage Penalty**

1. Application With or Without Criminal Penalties - In the event that the over-usage constitutes a crime under state or federal law, the District reserves the right to report the commission of that crime to the appropriate law enforcement authorities and to bring charges against the over user. It is the intent of the District's Board of Directors that the penalty provisions of set forth in this Rule shall apply regardless of whether the over-user is charged with or convicted of a crime as a consequence of the over-usage.

2. Initial Determination of Over Usage - As soon as the District is aware that over-usage has occurred, the District shall inform the water user, and concurrently the District will stop delivering all water until the over-usage is corrected. The water user shall have 30 days from the date of District notification of over-usage to correct the over-usage by increasing the water in the account in question to a level which is equal to or greater than the total amount of water used, (including the over-usage water), in order to avoid the imposition of a penalty. If the over-usage water has not been replaced within 30 days, then the water user is subject to the penalty set forth in this Rule.

3. Penalty - An over-usage penalty in the form of a rate per acre-foot of over-usage shall be applied to all over-usage water. The maximum over-usage penalty which may be accumulated in any given year will be the highest Supplemental Water cost paid by the District in the preceding 12 months, plus $200 per acre foot to cover administrative, legal and overhead costs.

4. Accounting - To the extent there is an over-usage penalty which has not been paid it shall be added to any unpaid water bills for the purpose of levying a lien against the real property in question. Furthermore, until such delinquencies are cured, the District shall suspend all services to the water user.

B. **Replacement and Recapture of Over-Used Water** - Regardless of whether a penalty is imposed or collected, the over-user is responsible for the replacement of the water which was over-used.

1. Sale of Supplemental Water - To the extent that Supplemental Water supplies are available to replace the over-used water, the District may, at the District's option, declare that the over-user has involuntarily purchased so much of the Supplemental Water as is available, at the price for Supplemental Water previously established by the Board of Directors of the District, up to the full amount of the over-usage. This involuntary sale of Supplemental Water to over-users is final and will not be reversed at a later date, even if a water user with over-usage finds another water supply at a less expensive price.

2. Voluntary Replacement To the extent that Supplemental Water is not available to replace the over-used water, the over-user may acquire water at any time prior to the end of the Water Year and transfer it to the account upon which the over-usage appears and pay all outstanding Penalties and thereby end his status as an over-user.

3. Recapture - If over-usage still exists at the end of a water year, then the District may subtract the over-usage from the next water year's allocation in a manner consistent with this Rule. If any recapture occurs, the Water Allocation Deposit and the Water Allocation Billing charges on the recaptured water must be paid at the same time and in the same manner as if the recaptured water was being used in the year of recapture. Over-used water will be recaptured by debiting accounts in the following priority:

   a. To the extent that this recapture can be accomplished by debiting the account of the water user who caused the over-usage, then the District will do so.

   b. If the water user who caused the over-usage will not receive an allocation in an amount which is sufficient to allow for the full recapture of the over-used water, then any un-recaptured portion of the over-used water will be recaptured by debiting the account of the land which was the subject of the over-usage.

   c. If the over-usage exceeds the total subsequent year's allocation as to all such accounts, then each subsequent year's water allocations shall be debited using the above-mentioned priority until the entire amount of over-usage is recaptured.

C. **Termination of Deliveries** - The district is under no obligation to deliver water if the water user is out of water or is other wise not entitled to the delivery of any water from the District. In order to minimize or avoid over-usage, the District's policy is to terminate deliveries in such a case until a new water supply is acquired and all penalties and delinquencies are cured. However, there may be circumstances under which the District is unable to terminate water deliveries due to the physical facilities by which the water user takes deliveries of water. In such circumstances, particularly if water deliveries cannot be curtailed to the water user in question without curtailing deliveries to another water user who is not out of water, the District will not terminate water deliveries to the water user who is out of water. In all situations in which the water user is out of water and where the physical facilities allow it, the District will terminate deliveries.

D. **Grievance Procedure** - The grievance procedure developed by the General Manager in compliance with the provisions of Article II of the District Rules, Section III, E, shall be applicable to all staff determinations made pursuant to this Rule 12. The District's initial notice to the water user of the over-usage shall include notification of the availability of this procedure. If a grievance is filed by a water user who has been notified that he is in an over-usage situation within three business days of his initial notification from the District of claimed over-usage, then all collection procedures will be held in abeyance until his grievance process has been completed. However, in the event that the grievance process eventually confirms any over-usage, the penalty shall be calculated retroactive to the date of initial posting of the bill, as if the grievance had not been filed. If the water

user is out of water, then even the filing of a timely grievance will not serve to delay the District's suspension of further water deliveries.

E. **Exception or Suspension of Enforcement** - The Board of Directors of the District, on its own motion, may make an exception to this rule or suspend the enforcement of this rule for a given class or category of water users if the Board determines that the enforcement of this rule as against that class or category of water user would not be in the best interests of the District as a whole. In such an event, all water users who are in the category or class so benefited shall be informed of the terms of the exception or suspension of enforcement and shall be treated equally.

Rule No. 13 - Access to Land and Ditches

The authorized System Operators and other agents of the District shall have access at all times to all lands irrigated from the canal system and to all canals, laterals and ditches, for the purpose of inspection, examination, measurements, surveys or other necessary purposes of the District, with the right of installation, maintenance, control and regulation of all meters or other measuring devices, gates, turnout, or other structures necessary or proper for the measurement and distribution of water.

Said District assumes no liability for damages to persons of property occasioned through defective ditches, pipelines, laterals, meters or measuring devices.

Rule No. 14 - Compliance with Rules

Refusal to comply with each and all of these rules and regulations or any violation of any of the foregoing rules and regulations or any interference with the proper discharge of the duties of any person employed by the District shall be considered sufficient cause for shutting off the water, and water will not again be furnished until the opinion of the Board of Directors full compliance had been made with all requirements herein set forth.

Rule No. 15 - Non-Liability of District

The District will not be liable for any damage of any kind of nature resulting directly or indirectly form any private ditch or pipeline or the water flowing therein or for negligent, wasteful or other use or handling of water by the users thereof. The district's responsibility shall absolutely cease when the water leaves the canal or a pipeline of the District. The District is not liable for shortages of water either temporary or permanent or for failure to deliver such water nor for interruptions in the delivery of water. The water user, and not the District, is responsible for installing protective devices to protect his private pump or other facilities from damage due to high water pressure and low water pressure which may occur from time to time in the District's water system.

Each property owner shall be responsible to the District for all damage to District property caused by his own negligent or careless acts or the negligent or careless acts of any agent, tenant, employee of the property owner. The cost of all such damage to the District shall be billed to the landowner.

Rule No. 16 - Extra Work Performed by the District

From time to time the District may agree, subject to the availability of District employees and equipment, to perform additional work on or for the benefit of property within the District. The District may require a deposit for any such work. Any such work performed by the District or by one of its employees on behalf or the District, shall be billed to the landowner or water user and shall accrue interest at the rate of

1.5% per month if unpaid 30 days after billing. The District is under no obligation to agree to perform any such work for anyone, but if the District should undertake such work then the District shall perform it in a workmanlike manner and shall complete the job to which it has committed.

All unpaid charges for such work are a lien on the land upon which the work was performed. Amounts, which are unpaid prior to the completion of the next assessment role, together with the penalty and/or interest, as applicable, will be added to and become a part of the annual assessment levied against the land. Water service to said land and, if applicable, to the water user requesting such work, shall be discontinued until the same inclusive of penalties and interest shall be paid in full.

Rule No. 17 - Changes in Rules and Regulations

The Board of Directors reserves the right to change these rules and regulations by majority action of the Board at any regular or special meeting, by adopting an appropriate resolution and spreading such resolution on the minutes of the District, a public record. Publication and dissemination of such changes by the printing of revised rules and regulations will be limited to economically feasible intervals as determined by the Board.

There shall be maintained at the office of the District, however, a loose-leaf master copy of these rules and regulations including all changes made by the Board of Directors, which copy will be open to inspection at any time during office hours of the District.

Rule No. 18 - Prohibiting Discharges

No District landowner or water user shall take any action (i) that would degrade the quality of water in the District's distribution system or in any creek, stream or watercourse within the District's boundaries, (ii) that would adversely affect any District owned, operated or controlled facilities, or (iii) that would result in the violation of any applicable legal requirement. Without limiting the foregoing, the no District landowner or water user shall allow or cause any tail water, runoff, spill water, backwash, other irrigation water silt, algae, chemicals or any other materials to (i) leave that landowner's or water user's property (ii) to enter into any District owned, operated or controlled facilities, or (iii) to enter into any creek, stream or other watercourse within the District's boundaries.

At the expense of the offending landowner or water user, the District will immediately remove upon discovery any facility that results, or could result, in a violation of this Rule No. 18. In addition, District water service to any landowner or water user violating this Rule No. 18 will immediately be discontinued without notice to the offending landowner or water user, and such water service will not be reinitiated until the offending landowner or water user has appeared before the District's board of directors and provided evidence satisfactory to the board of directors that continued violations of this Rule No. 18 will not occur. Any landowner or water user violating this Rule No. 18 will also be responsible for any increased costs incurred by the District as a result of that violation, including without limitation any increased monitoring or compliance costs incurred with connection with any discharge monitoring program undertaken by the District.

This Rule No. 18 will be strictly enforced, and waivers will not be allowed.

Rule No. 19 - Handling of Disputes

When a landowner or water user cannot resolve differences or controversies with the District's System Operator, System Supervisor or the Watermaster, they are to discuss the problem with the General Manager prior to asking the Board of Directors for a final determination. The Board of Directors reserves

the authority to act as the final level of appeal on differences and controversies between landowners or water users and District employees.

Rule No. 20 - Equitable Relief

The Board of Directors will strictly enforce these Rules and Regulations in order to ensure consistency and equitable treatment of all District landowners and water users. However, the Board recognizes that unique circumstances may arise from time to time that dictate relief from the strict enforcement hereof. The Board therefore reserves the right to consider such circumstances and grant equitable relief when the Board finds it to be appropriate. Such relief shall only be granted by a unanimous vote of the Board in extraordinary circumstances upon a demonstration of substantial justification for that relief by the party seeking it. Generally, such relief will only be considered if the relevant circumstances are outside of the control of the party requesting relief. Similarly, relief will not be considered or granted if the circumstances giving rise to the request for relief are the result of the actions or negligence of the requesting party.

Rule No. 21 - Encroachments

No trees, vines, shrubs, corrals, fences, buildings, bridges, or any other type of encroachment (either surface or subsurface) shall be planted or placed in, on, over or across any District canal, ditch, conduit or the right-of-way therefore except pursuant to specific written authority of the District's General Manager. Any such encroachment of an unusual or extraordinary nature shall be approved by the Board of Directors. Any unauthorized encroachment may be removed by the District at the expense of the encroacher.

Rule No. 22 - Unauthorized Installation

No delivery gate, pipe, siphon, meter, or any other structure or device shall be installed or placed in any canal, ditch or conduit owned by the District without express written permission and must be in strict compliance with plans and specifications approved by the General Manager or his designated representative. Any such structure or device installed on a District canal, ditch or conduit without approval may be removed by the District at the expense of the owner or other party installing it.

Rule No. 23 - Personal Liability

Any person entering upon District property or District right-of-way does so at his own risk and assumes all risks associated therewith, and by such action accepts the responsibility for any damage to District or private property resulting there from.

ARTICLE II

RULES AND REGULATIONS OF SAN LUIS WATER DISTRICT CONCERNING BILLING AND COLLECTION FOR DOMESTIC WATER SERVICE AND DOMESTIC SEWER SERVICE

1. **General Rules for Operation of Domestic Water and/or Domestic Sewer Systems**

   A. **Notice of Content of Rules**: The customer for domestic water service and/or domestic sewer services will be provided either with a copy of these rules and regulations or given notice of their existence and an opportunity to obtain a copy and, in either event, will sign an acknowledgment of such notice before domestic services are actually commenced.

B. **Collateral but Binding Documents**:

1. If, at any time, providing services to the domestic water and/or domestic sewer customer should in any way jeopardize the District's position with the Bureau of Reclamation or put the District at risk for being in violation of either a contractual agreement with the Bureau or a Bureau regulation or written policy, then the District may terminate domestic services to the customer if, in the opinion of a majority of the District's Board, such termination is necessary to correct the District's position with the Bureau.

2. If, at any time, providing services to a customer will result in the existence of a "public water system" for purposes of the federal Safe Drinking Water Act without the express prior consent of the District, the District may decline to provide or terminate such service if, in the opinion of a majority of the District's Board, the creation of such a "public water system is not in the best interests of the District. Unless expressly designated as potable domestic water, all water delivered by the district is non-potable and not to be used for domestic purposes. The use of District water for domestic uses without the prior knowledge and consent of the District is prohibited. Any violation by a customer of such prohibition may result in termination of water service, and will result in the District billing that customer for the District's costs (including without limitation actual and consequential damages) resulting from such violation.

3. If, at any time, providing services to the customer should in any way jeopardize the District's sewer discharge permit as to the sewer treatment plant servicing the customer's property or put the District at risk for being in violation of either the discharge permit or any regulations or written policy of the permitting agency such as the Regional Water Quality Control Board, the State Water Quality Control Board, Merced County Department of Health or the California Department of Public Health, then the District may terminate domestic services to the customer if, in the opinion of a majority of the District's Board, such termination is necessary to correct the District's position with the respective regulatory agency.

4. The Board shall adopt by motion and shall, from time to time, amend by motion a list of substances which shall not be disposed of through the District's domestic sewer systems. The list may vary depending on which treatment plant accepts the sewage from the affected property. A single violation of this policy by a customer may result in termination of all domestic sewer services to that customer and repeated violations shall result in termination of all domestic sewer or both domestic water and domestic sewer services to that customer. Any violation by a customer will result in the District billing that customer for the District's consequential damages. A charge that a customer has violated this Rule shall provide the customer with a right to pursue the grievance procedure described below but should such procedure either not be initiated or not pursued in a timely manner or exhausted, the District may add the bill for the District's consequential damages to the bill for sewer services and may impose any such unpaid bill as a lien against the real property which was the location of the violation.

C. **Extra-Jurisdictional Services**: The District will not provide domestic water or domestic sewer services outside of its jurisdictional boundaries as a general rule and shall never be compelled to do so. The District shall never provide Project Water, as defined in the District's contract with the Bureau of Reclamation, outside of the Contractor's Service Area, as defined by the District's contract with the Bureau of Reclamation, without the prior consent of the Bureau of Reclamation.

D. **Establishing Enterprise Accounts**: The domestic water enterprise and the domestic sewer enterprise shall each be treated as an enterprise account which is separate and apart from the agricultural water enterprise of the District, in accordance with the principals set forth in the Revenue Bond Act, (Government Code 54300, et seq.). Charges for domestic water and for sewer services, as well as penalties and interest rates for late payment and other events of default and re-connection charges, shall be determined from time to time, (but shall be considered at least annually,) by the Board of the District adopting by resolution a Schedule of Rates which sets the rates for services based on the cost to the District, including administrative overhead and establishes penalties, interest and re-connection charges. The cost of administration may be funded out of a general fund from which each of the enterprises purchase administrative services or it may be operated from one or the other enterprise accounts with the other enterprise accounts purchasing administrative services from that enterprise, or it may be shown as a cost item in each enterprise, depending upon the budget adopted each year by the Board.

E. **Authority of General Manager**: The water system and sewer system of the District are under the exclusive management and control of the Board of Directors of the District through its authorized agents and no other persons shall have any right to interfere with said system and works in any manner. The General Manager is the authorized agent for the Board for all matters. He may delegate his authority in this regard, from time to time, to authorized assistants and the Board may, from time to time, designate other authorized agents as well as the General Manager, should the need arise. The General Manager, or his authorized assistants shall have the right to go upon the property of landowners to check conditions and capacity of private ditches, pipelines, meters, septic systems and other water and/or sewer facilities or to maintain and/or replace existing District property and/or to read District meters.

2. <u>General Conditions for Delivery of Domestic Water</u>

A. General Conditions:

1. The provisions of this Article II, Chapter II, shall be inapplicable to the sale of raw, untreated water by the District to any other public agency which is also a water purveyor. Any of the provisions of Article II, Chapter III, hereof may also be superseded by specific provisions of a written agreement between the District and another public agency which is also a water purveyor which is approved and signed by the Boards of each of the public agencies involved. All water system improvements constructed within the District shall be in accordance with California Code of Regulations, specifically Title 17 and Title 22. The exceptions provided by this Rule shall be applicable to and include the Santa Nella County Water District.

2. All installation costs for any domestic water delivery services and/or domestic sewer services allowed by the District shall be paid by the owner of the land to which services are to be provided. All plans for providing a new domestic water and/or domestic sewer service to a customer shall be approved by the District Engineer and any cost of supervision of the installation of necessary facilities shall be paid by the customer.

3. There shall be no cross connections between domestic water systems owned or operated and maintained by the District and any privately owned wells or pipelines, a copy of which is provided to the District. It shall be the responsibility of the landowner to comply with all of the provisions of Title 17 of the California Code of Regulations and the Safe Drinking Water Act. No landowner shall construct or permit the use of any private facility which provides District water for domestic uses, including without limitation drinking or cooking, without the express prior written consent of the District and compliance with all applicable laws. If the District learns that a landowner has constructed or permitted the use of a private facility which provides District water for domestic uses, the District may immediately terminate any or all water service to such landowner. All properties provided domestic water service by the District shall have back flow devices installed and in good working order, as is required by the California Code of Regulations and any applicable health and/or building code requirements. Whether the back flow prevention devices are owned by the customer or owned by the District, the District shall have the power to have such devices tested and, if necessary, repaired, at the customer's expense.

4. All domestic water provided to a customer, whether as raw water or as treated water, shall be metered as the water leaves the District's water delivery system and enters the privately owned water delivery system. All properties provided domestic water by the District shall have water meters installed and in good working order as a condition precedent to receiving District domestic water. Whether the water meters are owned by the customer or owned by the District or owned by the Bureau, the District shall have the power to have such devices tested and, if necessary, repaired, at the customers' expense.

B. **Raw Untreated Water:**

1. Any water, whether treated or untreated, delivered by the District for other than agricultural purposes, and any water delivered by the District to owners of less than two acres of land shall be presumed to be purchased for domestic purposes.

2. Whenever raw, untreated water is to be sold for domestic purposes, water service will not be provided by the District until the installation has been approved by the California Department of Public Health and the services will be discontinued at any time the California Department of Public Health notifies the District that the user's equipment for filtering or treating said water is not operating properly. Similarly, whenever raw, untreated water is to be sold for domestic purposes, water service will not be provided by the District if the provision of such service will result in the existence of a "public water system" for purposes of the federal Safe Drinking Water Act without the express prior consent of the District. It shall be the responsibility of the landowner to comply with all of the provisions

of Title 17 of the California Code of Regulations and the Safe Drinking Water Act.

3. **Procedures for Billing and Collection for Domestic Water and/or Domestic Sewer Services**

A. All District customers for domestic water and/or domestic sewer services shall be billed on a monthly basis on a unified or single statement billing system. All payments for services provided shall be credited first to sewer and any other sums owed and lastly to domestic water. If payment in full is not made for services in a timely manner as set forth in these policies, then pursuant to the procedures set forth below, domestic water services will be terminated, and, if payment in full has not been made in an amount adequate to pay for domestic sewer services, those services shall also be terminated.

B. The District will mail or cause to be hand delivered a bill for domestic services to the customer once every month. The bill is due upon dispatch from the District.

1. If the customer has not paid the bill within nineteen (19) days after the bill was mailed or hand-delivered to the customer, then the District shall give the customer a written notice, which gives the customer notice that his services will be terminated if his bill is not brought current. This notice shall be dispatched to the customer in such a manner that the customer is given at least, ten (10) days actual notice prior to the termination of utility services for non-payment. If this notice is given by mail, the ten-day time period shall not begin until at least five days after this notice is deposited in the mail. The notice, however dispatched, shall contain at a minimum, the following information:

a. The name and address of the customer;

b. The amount of the delinquency;

c. The date by which payment or arrangement for payment must be made in order to avoid termination;

d. The procedure by which a customer may initiate a complaint or request an investigation concerning their account, assuming that information is not on the bill (see the consequences of a customer requesting an investigation or making a complaint set forth below);

e. The procedure by which a customer may request amortization of the unpaid charges, including the telephone number of a representative of the District who can provide additional information or institute arrangements for payment.

2. If the customer has still not paid his bill in full two days before the end of this initial notice time period, the District shall give the customer a second notice which is dispatched to the customer in such a manner that the customer is given at least forty-eight (48) hours notice prior to any termination of service. This second notice shall, at a minimum, contain each of the following:

a. The name and address of the customer;

b. The amount of the delinquency;

c. The date by which payment or arrangement for payment must be made in order to avoid termination;

d. The telephone number of a representative of the District who can provide additional information or institute arrangements for payment.

3. Notwithstanding the nineteen (19) days and the ten (10) days actual notice requirements of subsection (a) above and notwithstanding the forth-eight (48) hours notice provisions of subsection (b) above, the District shall be deemed to have complied with these provisions if the District's General Manager promulgates a billing and collection schedule which is substantial compliance with the foregoing provisions and the District in fact complies with the billing and collection schedule so promulgated by the District's General Manager.

C. If rental property is provided domestic water service or domestic sewer service or both such domestic services it shall be provided such service in the name of the property owner only, and not in the name of the tenant who is not the owner. The District Manager may provide a system whereby, as a service to the owner, a copy of the bill is sent to both the owner and the tenant but this shall not relieve the owner of the duty to pay the bill nor any way compromise the District's ability to treat the owner only as the customer.

D. The General Manager shall develop a procedure for a customer to request the amortization of delinquent charges for domestic water and/or domestic water and sewer services.

1. This procedure shall not allow for the amortization for a period longer than six months without specific authorization by the Board.

1. This procedure must require a customer to need a credit test before the District extends credit to the customer in the form of an amortization agreement. The only exception to the credit test requirement is that the District shall offer an amortization agreement to a customer who is behind in their bill and provides both of the following:

a. The certification of a licensed physician that to terminate the customer's utility would be life threatening to the customer; and

b. The customer is financially unable to pay for the services within the normal time period and is willing to enter into an amortization agreement.

3. This procedure shall allow for termination of services with no more than a forty-eight hour notice should a customer, during the term of the amortization agreement fail to both keep the current bill paid in full in a timely manner and make the payments on the back bill required by the amortization agreement.

E. The General Manager shall develop a procedure for a customer to pursue grievances with regard to disputed domestic water and/or sewer charges. The grievance procedure shall

be separate and apart from and shall not satisfy requirements with regard to tort claims. The General Manager shall designate or ask the Board to designate a District employee to act as Review Manager for the purposes of this grievance process. This procedure shall, at a minimum, meet the requirements and parameters set forth herein.

1. Any customer who wishes to dispute a bill for domestic water or sewer services may file a grievance to seek review of that bill. The grievance procedure shall be designed to give the customer an opportunity for his grievance to be reviewed by the Review Manager, (who shall be an employee of the District other than the person who prepared the billing) and, if in the opinion of the Review Manager it is appropriate, then the Review Manager shall, after his review of the complaint, investigate the customer's complaint. In addition to reviewing the complaint, the Review Manager shall determine whether it is appropriate to offer the customer who filed the grievance an opportunity to enter into an amortization agreement with the District.

2. If such a grievance is filed in a timely manner, the customer may also request as a part of the review process, that District's procedure for termination of domestic water and/or sewer services due to the nonpayment of a bill, be suspended while the District considers the customer's grievance if the customer asserts that the bill is beyond his financial means to pay in full during the pendency of the grievance. Such a request may, in the appropriate case, be granted by the District's General Manager or the Review Manager. Filing of such a request will be considered to be timely if it is made, in writing at the District's office, either

    a. Within five days of the customer receiving the bill he wishes to dispute, or

    b. Within thirteen (13) days of the dispatch by the District of a 10-day notice on a bill which the customer wishes to dispute.

3. The grievance procedure shall provide a process by which any customer, whose complaint or request for an investigation has not been favorably decided by the Review Manger, has a right to appeal that adverse determination. This procedure may either provide for a direct appeal to the Board of Directors of the District or for an interim appeal to the General Manager, but the procedure shall ultimately allow for a review by the full Board of Directors.

4. If a request for suspension of the utility termination process was granted while the Review Manager considered the grievance, in the event of an adverse determination by the Review Manager, the utility termination procedure shall proceed, whether or not the customer requests a further review of his grievance by the District or by the District's Board of Directors.

4. Water Conservation Ordinance

A. **Application:** This Chapter 4 is applicable to all M&I customers of the District who receive their water directly from the District as a retail service. It does not apply to those customers within the District who obtain their water from another water purveyor, such as Santa Nella County Water District.

B. **Purpose:** To ensure that the District's M&I water supply is put to beneficial use, that waste and unreasonable use of water is prevented and to establish an incremental water conservation plan for implementation in the case of severe drought or other water shortage.

C. **Water Waste Prohibited:** The following uses of water are prohibited at all times:

i. Run Off - Use of water in a manner or to an extent that results in water running to waste down a sidewalk, gutter, storm drain, ditch or across adjacent property
ii. Plumbing Leaks - the escape of water through leaks, breaks or other malfunction in the water users plumbing, distribution or irrigation systems
iii. Use of Open Hose - Use of a hose for any wash down not equipped with an automatic shut off nozzle.
iv. Untended Hose - Irrigation of trees and shrubs with an untended hose
v. Fire Hydrant - the use of any fire hydrant for purposes other than fire suppression without the express approval of the District

D. **Alternate Watering Days: -** Addresses ending in an even number may water landscaping only on Tuesdays, Thursdays and Saturdays. Addresses ending in an odd number may water landscaping only on Wednesdays, Fridays and Sundays.

E. **Penalties for Violation:** Penalties for violation of any water conservation rule as provided in this Article 4 are as follows:

i. First violation- warning
ii. Second violation- $25 fine
iii. Third violation- $50 fine
iv. Fourth and all subsequent violations- $100 each

All fines are payable with the next water bill.

F. **Water Shortage Stages:** In addition to the water conservation measures outlined in B and C of this Water Conservation Ordinance the following Rules and Regulations will apply:

1. **Stage I Conservation Measures:** Implemented when the District's CVP water supply allocation is 50% or below, and/or upon declaration of a Stage I shortage by the Board of Directors.

i. Washing exterior surfaces - the washing of sidewalks, fences, walls, driveways, buildings, tennis courts etc. is prohibited except where public health or safety would otherwise be compromised.
ii. Washing vehicles the washing of cars, trucks, trailers, boats, machinery etc is prohibited except with a bucket and hose with automatic shut off nozzle or at commercial wash facilities.
iii. Water use shall be reduced by 25%

2. **Stage II Conservation Measures:** Implemented when the District's CVP water supply allocation is 25% or below, and/or upon declaration of a Stage II shortage by the Board of Directors.

i. Washing vehicles - the washing of cars, trucks, trailers, boats, machinery etc. is prohibited except at commercial wash facilities.
ii. Residential lawn watering is prohibited.
iii. Refilling swimming pools is prohibited except by water sources approved by the General Manager.

iv. Irrigation of trees and shrubs is prohibited except by hand held hose equipped with an automatic shut off valve.
v. Irrigation of golf course fairways is prohibited.
vi. Water use shall be reduced by 40%.

3. **Other Water Conservation Measures:** In the case of severe water supply shortage or in circumstances not anticipated by this Chapter 4, the District may implement additional measures as necessary to satisfy the purposes of this Chapter.

G. **Exceptions, Waivers and Appeals:**

1. There shall be no exceptions to Section C of this Chapter 4.
2. The General Manager may grant a waiver from the alternate day watering provisions of Section D above for large landscapes such as parks and golf courses, where it can be demonstrated such alternate day watering limitation is not practical.
3. Establishing a new lawn- Except under Stage II Conservation below, the District may issue a temporary waiver of the alternate day watering schedule during the establishment of new lawns or groundcover.
4. The General Manager may issue a waiver under Stage 1 and II Conservation Measures, for M&I customers who have secured supplemental water supplies approved by the District.
5. Any District M&I customer may appeal the provisions of this Chapter to the General Manager.

5. Cross-Connection Control Ordinance

A. **Application:** This Chapter 5 is applicable to all M&I customers of the District required for cross connection surveys.

B. **Purpose**:

1. The purpose of this chapter is:
   i. to protect the public water supply against actual or potential contamination through cross-connections by isolating sources of contamination that may occur within a water user's premises because of some undiscovered or unauthorized cross-connection on the premises;
   ii. to eliminate existing connections between drinking water systems and other sources of water that are not approved as safe and potable for human consumption;
   iii. to eliminate cross-connections between drinking water systems and sources of contamination;
   iv. to prevent the making of cross-connections in the future.
2. These regulations are adopted pursuant to the state of California Administrative Code, Title 17 - Public Health entitled "Regulations Relating to Cross-Connections."
3. It is unlawful for any person, firm, or corporation at any time to make or maintain or cause to be made or maintained, temporarily or permanently, for any period of time whatsoever, any cross-connection between plumbing pipes or water fixtures being served with water by the District and any other source of water supply or to maintain any sanitary fixture or other appurtenances or fixtures which, by reason of their construction, may cause or allow backflow of water or other substances into the water supply system of the District and/or the service of water pipes or fixtures of any consumer of the District.

C. **Definitions:**

1. "Air-gap separation" means a physical break between a supply pipe and a receiving vessel. The air-gap shall be at least double the diameter of the supply pipe measured vertically above the top rim of the vessel, in no case less than one inch.
2. "Approved backflow prevention assembly" means an assembly which has passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated their competency to perform such tests to the California Department of Health Services.
3. "Approved water supply" means any water supply whose potability is regulated by a state or local health agency
4. "Auxiliary supply" means any water supply on or available to the premises other than the approved water supply.
5. "AWWA standard" means an official standard developed and approved by the American Water Works Association (AWWA).
6. "Backflow" means a flow condition, caused by a differential in pressure that causes the flow of water or other liquids, gases, mixtures or substances into the distributing pipes of a potable supply of water from any source or sources other than an approved water supply source. Back siphonage is one cause of backflow. Back pressure is the other cause.
7. "District" means the San Luis Water District
8. "Contamination" means a degradation of the quality of the potable water by any foreign substance which creates a hazard to the public health, or which may impair the usefulness or quality of the water,
9. "Cross-connection" means any unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome, and potable. Bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or other assemblies through which backflow could occur, shall be considered to be cross-connections.
10. "Double check valve assembly" means an assembly of two internally loaded, independently acting check valves, including resilient seated shut-off valves on each end of the assembly and test cocks for testing the watertightness of each check valve.
11. "Health agency" means the California Department of Public Health, or the local health agency with respect to a small water system.
12. "Local health agency" means the county or District health authority.
13. "Person" means an individual, corporation, company, association, partnership, municipality, public utility, or other public body or institution.
14. "Premises" means any and all areas on a water user's property which are served or have the potential to be served by the public water system.
15. "Public water system" means a system for the provision of piped water to the public for human consumption that has five or more service connections or regularly serves an average of twenty-five individuals daily at least sixty days out of the year.
16. "Reduced pressure principle backflow prevention assembly" means an assembly incorporating two internally loaded, independently operating check valves and an automatically operating differential relief valve located between the two checks, including resilient seated shut-off valves on each end of the assembly, and equipped with necessary test cocks for testing the assembly.
17. "Service connection" refers to the point of connection of a user's piping to the water supplier's facilities.
18. "Water supplier" means the person who owns or operates the approved water supply system.

19. "Water user" means any person obtaining water from an approved water supply system.

D. **Cross-Connection Protection Requirements**

1. General Provisions:
    i. Unprotected cross-connections with the public water supply are prohibited.
    ii. If the water user is receiving a potable water supply, the District will require the water user to install an approved backflow prevention assembly by and at the water user's expense for continued services or before a new service will be granted.
    iii. All water supply lines from the District's mains entering the premises, buildings, or structures shall be protected by an approved backflow prevention assembly. The type of assembly to be installed will be in accordance with the requirements of this chapter.
2. Each residential or commercial service connection from the District water system for supplying water to premises shall be protected against backflow of water from the premises into the public water system.
3. The type of protection that shall be provided to prevent backflow into the approved water supply shall be commensurate with the degree of hazard that exists on the consumer's premises. The type of protective assembly that may be required (listing in an increasing level of protection) includes: double-check valve assembly (DC), reduced pressure principle backflow prevention assembly (RP), and an air-gap separation (AG). The water user may choose a higher level of protection than required by the District. The minimum types of backflow protection required to protect the approved water supply, at the user's water connection to premises with varying degrees of hazard shall be as shown in Table 1 of Section 7604, Title 17, of the current edition of the California Administrative Code. Situations which are not covered in Table 1 shall be evaluated on a case by case basis and the appropriate backflow protection shall be determined by the District

E. **Backflow Prevention Assemblies**

1. Approved Backflow Prevention Assemblies.
    i. Only backflow prevention assemblies which have been approved by the District shall be acceptable for installation by a water user connected to the District's potable water system.
    ii. The District will provide, upon request, a list of approved backflow prevention assemblies.
2. Backflow Prevention Assembly Installation.
    i. Backflow prevention assemblies shall be installed in the manner prescribed in Section 7603, Title 22 of the current edition of the California Administrative Code. Location of the assemblies should be as close as practical to the user's connection. The District shall have the final authority in determining the required location of a backflow prevention assembly.
    ii. Immediately after installation, a certified backflow tester shall test the assembly prior to operation to ensure the device is installed and functioning as intended. . The tester shall be in possession of a valid certificate from the California-Nevada Section of the American Water Works Association.

3. Backflow Prevention Assembly Testing and Maintenance.
    i. The owners of any premises on which, or on account of which, backflow prevention assemblies are installed, shall have the assemblies tested by a certified backflow tester. The tester shall be in possession of a valid certificate from the California-Nevada Section of the American Water Works Association.
    ii. Backflow prevention assemblies must be tested at least annually and immediately after installation, relocation or repair. The District may require a more frequent testing schedule if it is determined to be necessary. No assembly shall be placed back in service unless it is functioning as required. A report in a form acceptable to the District shall be filed with the District each time an assembly is tested, relocated, or repaired. These assemblies shall be serviced, overhauled, or replaced whenever they are found to be defective and all costs of testing, repair, and maintenance shall be borne by the water user.
    iii. Upon request, the District will supply affected water users with a list of persons acceptable to the District to test backflow prevention assemblies. The District will notify affected customers by mail when annual testing of an assembly is needed.
    iv. The District may, at its option, test a water user's backflow prevention assembly to fulfill the requirements of this chapter, and at any time the water user will be charged for the test and any maintenance found necessary to keep the assembly in working order.
4. Backflow Prevention Assembly Removal. Approval must be obtained from the District before a backflow prevention assembly is removed, relocated, or replaced.
    i. Removal. The use of an assembly may be discontinued and the assembly removed from service upon presentation of sufficient evidence to the District to verify that a hazard no longer exists or is not likely to be created in the future;
    ii. Relocation. An assembly may be relocated following confirmation by the District that the relocation will continue to provide the required protection and satisfy installation requirements. A retest will be required following the relocation of the assembly;
    iii. Repair. An assembly may be removed for repair, provided the water use is either discontinued until repair is completed and the assembly is returned to service, or the service connection is equipped with other backflow protection approved by the District. A retest will be required following the repair of the assembly; and displacement. An assembly may be removed and replaced provided the water use is discontinued until the replacement assembly is installed. All replacement assemblies must be approved by the District and must be commensurate with the degree of hazard involved.

F. **Administrative procedures**
1. Water System Survey.
    i. The District shall review all requests for new services. Plans and specifications must be submitted to the District, and the required assembly must be installed before service will be granted.
    ii. The District may require an on-premise inspection to evaluate cross-connection hazards. The District will transmit a written notice requesting an inspection appointment to each affected water user. Any

water user who cannot or will not allow an on-premises inspection of their piping system shall be required to install the backflow prevention assembly the District considers necessary.

iii. The District may, at its discretion, require a reinspection for cross-connection hazards of any premises to which it serves water. The District will transmit a written notice requesting an inspection appointment to each affected water user. Any water user who cannot or will not allow an on-premises inspection of their piping system shall be required to install the backflow prevention assembly the District considers necessary.

2. Customer Notification - Assembly Installation.

i. The District will notify the water user of the survey findings, listing the corrective actions to be taken if any are required. A period of sixty days will be given to complete all corrective actions required, including installation of backflow prevention assemblies.

ii. A second notice will be sent to each water user who does not take the required corrective actions prescribed in the first notice within the sixty-day period allowed. The second notice will give the water user a two-week period to take the required corrective action. If no action is taken within the two-week period, the District may terminate water service to the affected water user until the required corrective actions are taken.

3. Customer Notification - Testing and Maintenance.

i. The District will notify each affected water user when it is time for the back- flow prevention assembly installed on their service connection to be tested. This written notice shall give the water user thirty days to have the assembly tested and supply the water user with the necessary form to be completed and resubmitted to the District.

ii. A second notice shall be sent to each water user which does not have their backflow prevention assembly tested as prescribed in the first notice within the thirty-day period allowed. The second notice will give the water user a two week period to have their backflow prevention assembly tested. If no action is taken within the two week period, the District may terminate water service to the affected water user until the subject assembly is tested.

iii. At its discretion, the District may provide annual testing and certification of backflow assemblies. All costs for repairs will be the responsibility of the property owner.

G. **Water Service Termination**

1. General. When the District encounters water uses that represent a clear and immediate hazard to the potable water supply that cannot be immediately abated, the District shall institute the procedure for discontinuing the District water service.
2. Basis for Termination. Conditions or water uses that create a basis for water service termination shall include but are not limited to, the following items:

i. Refusal to install a required back- flow prevention assembly;

ii. Refusal to test a backflow prevention assembly;

iii. Refusal to repair a faulty backflow prevention assembly;

iv. Refusal to replace a faulty backflow prevention assembly;

v. Direct or indirect connection between the public water system and an auxiliary line, raw water and/or tertiary transmission system;

vi. Unprotected direct or indirect connection between the public water system and a system or equipment containing contaminants;

vii. Unprotected direct or indirect connection between the public water system and an auxiliary water system;

viii. A situation which presents an immediate health hazard to the public water system.

3. Water Service Termination Procedures.
4. For conditions i, ii, iii, or iv, the District will terminate service to a customer's premises after two written notices have been sent specifying the corrective action needed and the time period in which it must be done. If no action is taken within the allowed time period, water service may be terminated.
5. For conditions v, vi, vii, or viii, the District will take the following steps: a. Make reasonable effort to advise water user of intent to terminate, water service; b. Terminate water supply and lock service valve. The water service will remain inactive until correction of violations has been approved by the District.

H. **Severability:** If any section, subsection, subdivision, paragraph, sentence, clause or phrase of this chapter, or any part thereof, is for any reason held to be invalid, such decision shall not affect the validity of the remaining portions of this chapter or any part thereof. The District declares that it would have passed each section, subsection, subdivision, paragraph, sentence, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, subdivisions, paragraphs, sentences, clauses, or phrases be declared invalid.

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SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX E

DISTRICT WATER RATES AND ASSESSMENTS

San Luis Water District

FY21 Summary of Agricultural Water Rates[1]

Cost ($) AC-FT

Description	Direct Service DMC	Direct Services SLC Above Dos Amigos	Direct Services SLC Below Dos Amigos	ID1	ID2	ID3
Water Charges						
Bureau Water Cost	$112.21	$139.23	$139.23	$139.23	$139.23	$139.23
Subtotal	**$112.21**	**$139.23**	**$139.23**	**$139.23**	**$139.23**	**$139.23**
Delivery Charges						
Administrative Charge	$19.64	$19.64	$19.64	$19.64	$19.64	$19.64
O&M Charge				$13.43	$25.00	
Rate Stabilization	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00
SLDMWA Conveyance Cost	$27.45	$55.94	$72.33	$72.33	$72.33	$55.94
Trinity PUD	$0.12	$0.12	$0.12	$0.12	$0.12	$0.12
Bureau Restoration Charge	$11.00	$11.00	$11.00	$11.00	$11.00	$11.00
Subtotal	**$59.21**	**$87.70**	**$104.09**	**$117.52**	**$129.09**	**$87.70**
Total Current Year Budget	**$171.42**	**$226.93**	**$243.32**	**$256.75**	**$268.32**	**$226.93**
Prior Period Budget	*$144.16*	*$234.79*	*$234.79*	*$248.22*	*$259.79*	*$234.79*
% Increase/Decrease	18.91%	-3.35%	3.63%	3.44%	3.28%	-3.35%

[1] *This is a summary of rates for water allocated by the District. Other water (DMC well water, transfers in, etc.) may have different and/or additional rates.*

San Luis Water District
FY21 Summary of Transer In & Supplemental Water Rates

Description	Cost ($) AC-FT					
	Direct Service DMC	Direct Services SLC Above Dos Amigos	Direct Services SLC Below Dos Amigos	ID1	ID2	ID3
Water Charges						
SLDMWA Conveyance Cost *	$27.45	$55.94	$72.33	$72.33	$72.33	$55.94
Administrative Charge	$19.64	$19.64	$19.64	$19.64	$19.64	$19.64
O&M Charge				$13.43	$25.00	
Rate Stabilization	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00
Total Budget FY19	**$48.09**	**$76.58**	**$92.97**	**$106.40**	**$117.97**	**$76.58**

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX F

DISTRICT SAMPLE WATER BILL, ANNUAL WATER APPLICATION, AND WATER TRANSFER FORM

San Luis Water District
P.O. Box 2135, Los Banos, CA 93635
Telephone: (209) 826-4043 Facsimile: (209) 826-0524

[redacted]
Firebaugh, CA 93622

Financial Summary
February 11, 2021 - March 10, 2021

Account #:	[redacted]
Opening Balance:	425.60
Payments:	0.00
Adjustments:	0.00
Charges:	0.00
Closing Balance:	425.60

Please Pay This Amount: $425.60

Remittance Stub: Please return with your payment.

San Luis Water District Account Statement

Financial Transactions -

2/10/21 January Billing Invoice #115558 Due Date: 3/10/2021 $425.60

Invoice Detail	Turnout	Water Category	Qty	Unit	Rate	Amount
	R43	District Supplemental Water	4.00	acft	106.40	$425.60

Reading Date	Prior Reading	Final Reading	Adjust	Qty	Unit
1/31/2021				4.00	acft

Water Transactions -

Category		Date	Transaction		Quantity	
Number	Description		Number	Description	Ac-Ft	Cc-Ft
WC0002	Bureau - Ag. - SLC	04/22/20	39086	2020 15% Ag & 65% Historic M&I	215	0
		05/20/20	39423	2020 Add.5% Ag & 5% Historic M&I	76	0
		08/07/20	39969	Transfer to Almendra Prop. I	-234	0
		10/10/20	40239	September Usage	-57	0
					0	0
WC0015	District Supplemental Water	04/30/20	39300	2020 Supplemental Water Pool 1	484	0
		05/10/20	39399	March & April Usage	-21	0
		06/10/20	39633	May Usage	-280	0
		06/10/20	39635	April Adjustment Credit/Usage	-17	0
		06/22/20	39706	2020 Supplemental Water Pool 1, 2nd Allocation	1,097	0
		07/10/20	39866	June Usage	-428	0
		07/27/20	39912	2020 Supplemental Water Pool 1, 3rd Allocation	100	0
		08/10/20	40015	July Usage	-485	0
		09/10/20	40147	August Usage	-408	0
		10/09/20	40222	Transfer from Almendra Properties I	114	0
		10/10/20	40239	September Usage	-156	0
		11/05/20	40327	Transfer from Almendra Properties I	285	0
		11/10/20	40359	October Usage	-285	0
		12/08/20	40417	Transfer from Almendra Properties I	98	0
		12/10/20	40433	November Usage	-98	0
		02/05/21	40530	Transfer from Almendra Properties I, LP	4	0
		02/10/21	40586	January Usage	-4	0
					0	0
WC0023	Rescheduled - Ag - DMC	03/01/20	38799	2019 Rescheduled into 2020	150	0
		04/01/20	39234	Rescheduling Guideline Monthly April 1 Losses	-1	0
		05/10/20	39399	March & April Usage	-149	0
					0	0
WC0033	Long Term Supplemental Water	05/08/20	39361	Transfers from Almendra Properties I	105	0
		05/10/20	39399	March & April Usage	-105	0
					0	0
					0	0

* Accounts with a negative water balance are subject to the requirements set forth in Rule 12 Over- Usage of Water

** Water allocated to this account is for agricultural purposes only . Usage for any domestic purpose is a violation of federal law and the District's Rules & Regulations.

*** Payments must be recieved on or before the due date. Postmark dates will not be excepted.

Financial Summary **16200** **Almendra Properties II, LP**

Summary for February 11, 2021 - March 10, 2021

Opening Balance:	425.60
Payments:	0.00
Adjustments:	0.00
Charges:	0.00
Closing Balance:	425.60

Aging Summary			
1-30 Days Delinquent	31-60 Days Delinquent	61-90 Days Delinquent	Over 90 Days Delinquent

SAN LUIS WATER DISTRICT
ANNUAL WATER APPLICATION
2021 WATER YEAR

[redacted]

Account # [redacted]

I hereby apply to San Luis Water District for: (please check only 1 box)

- ☐ All
- ☐ An amount not to exceed _____ acre-feet
- ☐ None (***Crop information is still mandatory***)

of my pro-rata share of the District's 2021 water supply, as allocated by the Bureau of Reclamation, for the parcels owned by the above-named entity. The 2021 water year begins on March 1, 2021 and ends on February 28, 2022.

I am aware that the District has adopted Bylaws, Rules & Regulations and Policies governing various aspects of the District's relationship with its landowners and water users, which may be amended from time to time by the District's Board of Directors. I am familiar with the District's Bylaws, Rules & Regulations and Policies in effect as of the date of this application, and will diligently review all future amendments and supplements thereto. At all times, and as a condition to the continued availability of water to me from the District, I agree to be bound by and comply with all of the District's Bylaws, Rules & Regulations and Policies as they may be amended or supplemented from time to time.

I recognize that an allocation of District water in any given water year is contingent upon the availability of water to the District, submission of an executed Water Application, and full payment of the Water Allocation Deposit Charges by the close of business on March 10, 2021. Failure to meet these conditions will result in the loss of my 2021 Water Allocation.

I acknowledge that the delivery of water to my property is dependent upon several additional requirements. These include but are not limited to, the submission of all essential certification and/or reporting forms under the Reclamation Reform Act of 1982 (RRA), compliance with all applicable laws, timely payment for all Water Allocation and Delivery Charges whether the water has been transferred to a third party or not. I understand that any unpaid charges for water or water service will be added to the assessment roll and will become a lien on my property.

I accept that I am ultimately responsible for all water delivered to my property and recognize that usage outside of the District's boundary is expressly prohibited and grounds for immediate suspension of service. I understand that all water provided to me by the District will be untreated, and that use for human consumption or other domestic purposes could result in illness. I agree to respond to District requests for information regarding water usage, including but not limited to, the Annual Crop & Irrigation Survey. The Annual Crop & Irrigation Survey is mandatory whether I am engaged in agricultural endeavors or not. I understand that any over-usage associated with the delivery of water to my property may ultimately be taken from future water allocations to my property or cause a like quantity of water to be involuntarily sold to me under Section B of District Rule 12 at a price determined by the Board of Directors.

I represent that I have the legal right to make this Application and I will indemnify and hold the District harmless from anyone who holds an interest in the above listed account who claims I acted without due authority.

Failure to submit a signed 2021 Water Application, Crop & Irrigation Survey, or payment for the Water Allocation Deposit billing by 5:00 p.m. March 10, 2021 will result in a 5% deposit penalty if the late application or deposit is accepted by the Board in its sole discretion. Failure to submit all of the above by March 22, 2021 will result in a 10% deposit penalty if the late application or deposit is accepted by the Board in its sole discretion. All late applications and deposits remain subject to Board approval.

_____ _____

Signature Date

San Luis Water District
Water Transfer Agreement
2021 Water Year

This Agreement authorizes San Luis Water District to execute the following transfer in the 2021 water year:

❑ Please transfer _____ ac-ft of Category _____ water to the individual/entity identified below.

❑ Please transfer ALL of my 2021 Water Allocation(s) to the individual/entity identified below. I am aware that in checking this box, 100% of the water allocated to my account in this water-year, whether paid for or not, will be automatically transferred to this single account. I agree to remain fully and ultimately responsible for payment of any and all charges, delinquencies, penalties, and/or interest accrued on my account as a result of this decision.

From: Account # _____ Name (Print)_____

To: Account # _____ Name (Print)_____

I am aware that the District has adopted Bylaws, Rules & Regulations, and Policies governing various aspects of the District's relationship with its landowners and water users, and that the District's Board of Directors may amend such Bylaws, Rules & Regulations, and Policies from time to time. I am familiar with the District's Bylaws, Rules & Regulations, and Policies in effect as of the date of this application, and will diligently review all future amendments thereof. At all times, and as a condition to the continued availability of water to me from the District, I agree to be bound by and comply with all of the District's Bylaws, Rules & Regulations, and Policies as they may be amended in from time to time.

I acknowledge that the delivery of water is dependent upon the availability of said water to the District. I represent that I have the legal right to make this transfer and I will indemnify and hold the District harmless from anyone who holds an interest in the above listed account who claims I acted without proper authority.

_____ _____
Transferor Signature Date

_____ _____
Transferee Signature Date

SLWD Transfer No: _____ SLWD Fax Number: (209) 826-0524

Transferors are reminded that fallowed land must be maintained in accordance with appropriate agronomic practices and all applicable regulatory and legal requirements. Failure to do so may result in civil liability as well as enforcement and other action by governmental agencies.

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX G

District Water Inventory Tables

Table 1

Surface Water Supply

2020/21 Month	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (define) (acre-feet)	Other Water (Previously Banked) (acre-feet)	Transfers into District (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
Method	M3	M3			M3			
March	2,627	37	0	0	0	529	0	3,193
April	5,263	48	0	0	0	818	0	6,129
May	4,392	57	0	0	2,004	4,775	0	11,228
June	0	57	0	0	0	13,138	0	13,195
July	226	60	0	0	0	13,459	0	13,745
August	4,057	61	0	0	0	4,702	0	8,820
September	2,245	53	0	0	0	3,871	0	6,169
October	689	56	0	0	0	6,070	0	6,815
November	0	39	0	0	0	2,800	0	2,839
December	0	31	0	0	0	433	0	464
January	123	23	0	0	112	995	0	1,253
February	294	27	0	0	0	1,648	0	1,969
TOTAL	19,916	549	0	0	2,116	53,238	0	75,819

Table 2

Ground Water Supply

2020/21 Month	District Groundwate (acre-feet)	Private Urban *(acre-feet)	Private Agric Groundwater *(acre-feet)
Method			
March	0	0	0
April	0	0	0
May	0	0	2,400
June	0	0	2,400
July	0	0	2,400
August	0	0	2,400
September	0	0	2,400
October	0	0	0
November	0	0	0
December	0	0	0
January	0	0	0
February	0	0	0
TOTAL	0	0	12,000

*Private Groundwater is Estimated

Table 3

Total Water Supply

2020/21 Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Recycled M&I Wastewater (acre-feet)	Total District Water (acre-feet)
Method				
March	3,193	0	0	3,193
April	6,129	0	0	6,129
May	11,228	0	0	11,228
June	13,195	0	0	13,195
July	13,745	0	0	13,745
August	8,820	0	0	8,820
September	6,169	0	0	6,169
October	6,815	0	0	6,815
November	2,839	0	0	2,839
December	464	0	0	464
January	1,253	0	0	1,253
February	1,969	0	0	1,969
TOTAL	75,819	0	0	75,819

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

Table 4

Agricultural Distribution System

2020/21 Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitatio -- (acre-feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage (acre-feet)	Total (acre-feet)
Lined Canals	75,504	50	3,775,200	28.4	429.2	0	0	(401)
Unlined Canals	16,896	50	844,800	6.4	96.0	0	322	(412)
	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
	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
	0	0	0	0.0	0.0	0	0	0
TOTAL	92,400	100	4,620,000	34.7	525.3	0.0	322.0	(813)

Urban Distribution System

2020/21 Area or Line	Length (feet)	Leaks (acre-feet)	Breaks (acre-feet)	Flushing/Fire (acre-feet)	Total (acre-feet)
PVC Pipeline	10,000	22	0	0	22
	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
	0	0	0	0	0
	0	0	0	0	0
TOTAL	10000	21.96	0	0	22

Table 5

Crop Water Needs

2020/21 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requirement (AF/Ac)	Cultural Practices (AF/Ac)	Effective Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
Alfalfa	815	3.61	0.14	0.0	0.27	2,838
Almonds (young)	4,562	2.20	0.15	0.0	0.27	9,493
Almonds (mature)	16,573	3.31	0.23	0.0	0.27	54,174
Apples	1	3.30	0.23	0.0	0.27	2
Apricots	204	3.14	0.22	0.0	0.27	629
Cherries	211	3.30	0.23	0.0	0.27	689
Citrus	316	2.85	0.20	0.0	0.27	878
Corn	1,021	2.38	0.14	0.0	0.27	2,296
Cotton	1,326	2.71	0.24	0.0	0.27	3,554
Grapes	91	2.36	0.09	0.0	0.27	198
Figs	379	3.30	0.23	0.0	0.27	1,236
Melons	888	1.45	0.07	0.0	0.27	1,109
Oats	566	1.33	0.12	0.0	0.27	666
Olives	94	3.17	0.25	0.0	0.27	296
Ornamental/Landscape	3	3.17	0.25	0.0	0.27	8
Peaches	2	3.14	0.22	0.0	0.27	5
Pistachios	2,782	3.00	0.15	0.0	0.27	8,005
Prunes	31	3.30	0.23	0.0	0.27	100
Tomatoes	1,812	2.12	0.15	0.0	0.27	3,617
Vegetables, Mixed	15	1.41	0.08	0.0	0.27	18
Walnuts	110	3.48	0.24	0.0	0.27	380
Wheat	1,432	1.33	0.13	0.0	0.27	1,705
Crop Acres	33,233					91,895

Total Irrig. Acres 33,233 (If this number is larger than your known total, it may be due to double cropping)

Table 6

2020/21 District Water Inventory

Type of Water	Location of Information		
Water Supply	Table 3		75,819
Environmental Consumptive Use	(Distribution, Drain, etc.)	minus	0
Groundwater recharge	(intentional - ponds, injection)	minus	112
Seepage	Table 4	minus	322
Evaporation - Precipitation	Table 4	minus	491
Spillage	Table 4	minus	0
Leaks, Breaks, Flushing / Fire	Table 4	minus	22
Transfers out of District		minus	0
Water Available for sale to customers			74,873
Actual Agricultural Water Sales	2020/21 From District Sales Records		76,793
Private Groundwater	Table 2	plus	12,000
Crop Water Needs	Table 5	minus	91,895
Drainwater outflow	(tail and tile not recycled)	minus	1,181
Percolation from Agricultural Land	(calculated)		(4,284)
M&I Actual Water Sales	2020/21 From District Records		549
Inside Use	Feb urban use x 12		275
Landscape / Outside Use	(calculated)		275
Unaccounted for Water	(calculated)		(2,469)

Table 7

Influence on Groundwater and Saline Sink

2020/21	
Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence on	1,615
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	33,233
Irrigated acres over a perched water table	5,200
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	(670)
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	(670)

Table 8

Annual Water Quantities Delivered Under Each Right or Contract

Year	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (define) (acre-feet)	Other Water (Previously Banked) (acre-feet)	Transfers into District (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
2011/12	61,592	800	0	0	0	37,063	0	99,455
2012/13	32,127	710	0	0	0	60,052	0	92,889
2013/14	16,458	572	0	0	0	64,187	0	81,217
2014/15	34	0	0	0	0	63,490	0	63,524
2015/16	23,219	511	0	0	0	35,886	0	59,616
2016/17	1,405	426	0	0	0	61,544	0	63,375
2017/18	21,945	619	0	0	0	57,372	0	79,936
2018/19	35,952	574	0	0	0	34,400	0	70,926
2019/20	42,240	616	0	0	0	33,214	0	76,070
2020/21	19,916	549	0	0	2,116	53,238	0	75,819
Total	254,888	5,377	0	0	2,116	500,446	0	762,827
Average	25,489	538	0	0	212	50,045	0	76,283

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX H

2020 Consumer Confidence Report

2019 Consumer Confidence Report

Water System Name: **San Luis Hills - San Luis Water District** **R**eport Date: June 23, 2020

We test the drinking water quality for many constituents as required by State and Federal Regulations. This report shows the results of our monitoring for the period of January 1 2019 – December 31, 2019.

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.59

Type of water sources in use:
The only source of water is the San Luis Canal (California Aqueduct), which provides surface water exported from the San Francisco Bay-Delta.

Name & location of source:
The San Luis Canal (California Aqueduct) raw water enters the District's distribution system from the Canal at milepost 75.49-R near Pioneer Road. The water is treated at the San Luis Truck Plaza Water Treatment Facility. The facility utilizes a conventional treatment process, which includes flash mixing and chemical coagulation, flocculation, sedimentation, filtration and chlorination.

Drinking Water Source Assessment information:
The California Department of Public Health will be performing a drinking water source assessment. The results of this program will be provided upon completion. A previous assessment titled "Sanitary Survey Update Report 1996" was prepared by the Department of Water Resources, Division of Local Assistance, Water Quality Assessment Branch.

Time and place of regularly scheduled board meetings for public participation:
The Board of Directors meets regularly at 1:30 PM on the last Tuesday of every month. Meetings are held at the District's office at 1015 Sixth Street in Los Banos, California.

For more information contact Mike Zuspan, Treatment Supervisor Phone: (209) 826-4043

TERMS USED IN THIS REPORT*:*

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

Primary Drinking Water Standards (PDWS): MCLs and MRDL's for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standards (SDWS): MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.

ND: not detectable at testing limit
ppm: parts per million or milligrams per liter (mg/L)
ppb: parts per billion or micrograms per liter (ug/L)
ppt: parts per trillion or nanograms per liter (ng/L)
ppq: parts per quadrillion or nanograms per liter (pg/L)
pCi/L: picocuries per liter (a measure of radiation)

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

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

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

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

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

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

Variances and Exemptions: Department permission to exceed an MCL or not comply with a treatment technique under certain conditions.

Level 1 Assessment: A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

Level 2 Assessment: A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

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

Contaminants that may be present in source water include:

- *Microbial contaminants*, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- *Inorganic contaminants*, such as salts and metals, that can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- *Pesticides and herbicides*, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- *Organic chemical contaminants*, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum, production, and can also come from gas stations, urban storm water runoff, and septic systems.
- *Radioactive contaminants*, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, USEPA and the state Department of Health Services (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

Tables 1 -5 and 8 list all of the drinking contaminants that were detected during the most recent sampling for the constituent. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The Department allows the District to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, through representative of the water quality, are more than one year old.

TABLE 1 – SAMPLING RESULTS SHOWING THE DETECTION OF COLIFORM BACTERIA

Microbiological Contaminants (complete if bacteria detected)	**Highest No. of Detections**	**No. of Months In violation**	**MCL**	**MCLG**	**Typical Source of Bacteria**
Total Coliform Bacteria	(In a month) 0	0	More than 1 sample in a month with a detection.	0	Naturally present in the environment
Fecal Coliform or E. coli	(In the year) 0	0	A routine sample and a repeat sample detect total coliform and either sample also detects fecal coliform or E. coli	0	Human and animal fecal waste

TABLE 2 – SAMPLING RESULTS SHOWING THE DETECTION OF LEAD AND COPPER

Lead and Copper (complete if lead or copper detected in the last sample set)	**No. of samples collected**	**90th percentile level detected**	**No. Sites exceeding AL**	**AL**	**MCLG**	**Typical Source of Contaminant**
Lead (ppb)	5	<0.005(ppm)	0	15	2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits.
Copper (ppm)	5	0.285(ppm)	0	1.3	0.17	Internal corrosion of household water plumbing systems; erosion of natural deposits; leaching from wood preservatives.

TABLE 3 – SAMPLING RESULTS FOR SODIUM AND HARDNESS

Chemical or Constituent (and reporting units)	**Sample Date**	**Level Detected**	**Range of Detections**	**MCL**	**PHG (MCLG)**	**Typical Source of Contaminant**
Sodium (ppm)	08/07/19	19.0	N/A	None	None	Salt present in the water and is generally naturally occurring
Hardness (ppm)	08/07/19	59.0	N/A	None	None	Sum of polyvalent cations present in the water, generally magnesium and calcium and are usually naturally occurring

Any violation of an MCL or AL is asterisked. Additional information regarding the violation is provided later in this report.

TABLE 4 – DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source Of Contaminant
Aluminum	08/07/19	71.0 ppb	N/A	1000 ppb	0.6 PHG N/A (MCLG)	Erosion of natural deposits; residual from some surface water treatment processes
Antimony	08/07/19	ND ppb	N/A	6.0 ppb	20 PHG N/A (MCLG)	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
Arsenic	08/07/19	2.0 ppb	N/A	10 ppb	0.004	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes.
Asbestos	08/09/17	<0.20 MFL	N/A	7-MFL	N/A PHG 7 (MCLG)	Internal corrosion of asbestos cement water mains; erosion of natural deposits.
Barium	08/07/19	ND ppb	N/A	1000 ppb	N/A PHG 2.0 (MCLG)	Discharge of oil drilling wastes and from metal refineries; erosion of natural deposits.
Beryllium	08/07/19	ND ppb	N/A	4.0 ppb	N/A PHG 1.0 (MCLG)	Discharge from metal refineries; coal-burning factories, and electrical, aerospace, and defense industries.
Cadmium	08/07/19	ND ppb	N/A	5.0 ppb	.04 PHG N/A (MCLG)	Internal corrosion of galvanized pipes; erosion of natural deposits; discharge from electroplating and industrial chemical factories and metal refineries; runoff from waste batteries and paints.
Chromium	08/0719	ND ppb	N/A	50.0 ppb	N/A PHG 100.0 (MCLG)	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits.
Fluoride	08/07/19	ND ppm	N/A	2.0 ppm	1.0 PHG N/A (MCLG)	Erosion of natural deposits; water additive, which promotes strong teeth; discharge from fertilizer and aluminum factories.

TABLE 4 – DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source Of Contaminant
Mercury	08/07/19	ND ppb	N/A	2.0 ppb	1.2 PHG N/A (MCLG)	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland.
Nickel	08/07/19	ND ppb	N/A	100.0 ppb	12.0 PHG N/A (MCL	Erosion of natural deposits; discharge from metal factories.
Nitrite (as nitrogen,N)	08/07/19	ND ppm	N/A	1000 ppb	1.0 PHG N/A (MCLG)	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Nitrate (as nitrate,NO3)	08/07/19	ND ppm	N/A	45.0 ppm	45.0 PHG N/A (MCLG)	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Selenium	08/07/19	ND ppb	N/A	50.0 ppb	N/A PHG 30.0 (MCLG)	Discharge from petroleum, glass and metal refineries; erosion of natural deposits; discharge from mines and chemical manufacturers; runoff from livestock lots (feed additive).
Thallium	08/07/19	ND ppb	N/A	2.0 ppb	0.1 PHG N/A (MCLG)	Leaching from ore-processing sites' discharge from electronics, glass and drug factories.
Gross Alpha	06/25/09 09/10/09 12/15/09 03/22/10	6.2 pCi/l <3.0 <3.0 3.10	2.25 pCi/l	15.0 pCi/l	N/A PHG 0 (MCLG)	Erosion of natural deposits.

TABLE 5 – DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detection	MCL	PHG (MCLG)	Typical Source of Contaminant
Color	08/07/19	20.0 units	N/A	15 units	N/A	Naturally-occurring organic materials*
Copper	08/07/19	ND ppb	N/A	1000 ppb	N/A	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives.
Foaming Agents (MBAS)	08/07/19	<0.050 ppm	N/A	0.5 ppm	N/A	Municipal and industrial waste discharges.
PH	08/07/19	8.2 (STD.Units)	N/A	6.5 – 8.5	N/A	Leaching from natural deposits.
Silver	08/07/19	ND ppb	N/A	100.0 ppb	N/A	Industrial discharges
Turbidity	08/07/19	2.1 units	N/A	5.0 units	N/A	Soil Runoff
Zinc	08/07/19	ND ppb	N/A	5000 ppb	N/A	Runoff/leaching from natural deposits; industrial wastes.
Total Dissolved Solids (TDS)	08/07/19	130.0 ppm	N/A	1000.0 ppm	N/A	Runoff/leaching from natural deposits.
Specific Conductance	08/07/19	220.0 micromhos	N/A	1600.0 micromhos	N/A	Substances that form ions when in water; seawater influence
Sulfate	08/07/19	12.0 ppm	N/A	500.0 ppm	N/A	Runoff/leaching from natural deposits; industrial wastes.
Chloride	08/07/19	23.0 ppm	N/A	500.0 ppm	N/A	Runoff/leaching from natural deposits; seawater influence
Iron	08/07/19	130.0 ppb	N/A	300.0 ppb	N/A	Leaching from natural deposits; industrial wastes.
Manganese	08/07/19	ND ppb	N/A	50.0 ppb	N/A	Leaching from natural deposits

*The San Luis Hills – San Luis Water District water system exceeded the source water color MCL

of 15 units. Color in water is from naturally - occurring organic materials. After water treatment we had no noticeable color. System had no violations and is in compliance with all Coliform bacteria and filtered water turbidity requirements standards for 2019. Beginning 2020 system will sample for both source and finish water color levels.

Additional General Information on Drinking Water

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

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

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. San Luis Water District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from Safe Drinking Water Hotline (1-800-426-4701) or at http://www.epa.gov/lead.

IMPORTANT – NON-POTABLE WATER IS USED FOR LANDSCAPE IRRIGATION

Residents and Business owners should be reminded that all landscape irrigation is conducted with Non-Potable Water. The Non-Potable Water is delivered using a completely independent plumbing system from the Potable Water System. Therefore, at no time shall any Resident or Business make any plumbing changes that could interconnect the two systems. A cross connection of the two systems can cause serious health effects. Contact the District immediately at (209) 826-4043 if you suspect there has been a cross connection between the potable and non-potable water systems.

For Systems Providing Surface Water as a Source of Drinking Water

TABLE 8 – SAMPLING RESULTS SHOWING TREATMENT OF SURFACE WATER SOURCES	
Treatment Technique[(a)] (Type of approved filtration technology used)	Conventional Filtration and Treatment: A process which includes flash mixing and chemical coagulation, flocculation, sedimentation, filtration and chlorination.
Turbidity Performance Standards[(b)] (that must be met through the water treatment process)	Turbidity of the filtered water must; 1 – Be less than or equal to ≤1.0 NTU in 95% of measurements in a month. 2 – Not exceed 0.3 NTU for more than eight consecutive hours. 3 – Not exceed 2.0 NTU at any time.
Lowest monthly percentage of samples that met Turbidity Performance Standard No. 1.	100%
Highest single turbidity measurement during the year.	0.263 NTU-
The number of violations of any surface water treatment requirements.	1- Disinfection By-Product Rule.

(a) A required process intended to reduce the level of a contaminant in drinking water.
(b) Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements.
* *Any violation of a TT is marked with an asterisk. Additional information regarding the violation is provided below.*

Summary Information for Violation of a Surface Water Treatment Technique (TT)

VIOLATION OF A SURFACE WATER TT				
TT Violation	Explanation	Duration	Actions Taken to Correct the Violation	Health Effects Language
Disinfection ByProduct Precursors Treatment Technique Requirement of Percent TOC Removal Ratio > 1.0	Failure to achieve acceptable levels of TOC removal	1st Quarter of 2019 2nd Quarter of 2019 3rd Quarter of 2019 4th Quarter of 2019	The District is testing different treatment techniques to optimize TOC reduction. And has replaced filter media.	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts.

APPENDIX F: Certification Form (Suggested Format)

Consumer Confidence Report
Certification Form
(to be submitted with a copy of the CCR)

(To certify electronic delivery of the CCR, use the certification form on the State Board's website at http://www.swrcb.ca.gov/drinking_water/certlic/drinkingwater/CCR.shtml)

Water System Name: San Luis Hills- San Luis Water District

Water System Number: 2400209

The water system named above hereby certifies that its Consumer Confidence Report was distributed on 06/30/2020 to customers (and appropriate notices of availability have been given). Further, the system certifies that the information contained in the report is correct and consistent with the compliance monitoring data previously submitted to the State Water Resources Control Board, Division of Drinking Water.

Certified by: Name: Ben Fenters

Signature: Benjamin J Fenters

Title: District Engineer

Phone Number: (209)826-4043 Date: 06/30/2020

To summarize report delivery used and good-faith efforts taken, please complete the below by checking all items that apply and fill-in where appropriate:

☒ CCR was distributed by mail or other direct delivery methods. Specify other direct delivery methods used: **Distributed by mail.**

☐ "Good faith" efforts were used to reach non-bill paying consumers. Those efforts included the following methods:

- ☐ Posting the CCR on the Internet at www._____
- ☐ Mailing the CCR to postal patrons within the service area (attach zip codes used)
- ☐ Advertising the availability of the CCR in news media (attach copy of press release)
- ☐ Publication of the CCR in a local newspaper of general circulation (attach a copy of the published notice, including name of newspaper and date published)
- ☐ Posted the CCR in public places (attach a list of locations)
- ☐ Delivery of multiple copies of CCR to single-billed addresses serving several persons, such as apartments, businesses, and schools
- ☐ Delivery to community organizations (attach a list of organizations)
- ☐ Other (attach a list of other methods used)

☐ *For systems serving at least 100,000 persons*: Posted CCR on a publicly-accessible internet site at the following address: www._____

☐ *For investor-owned utilities*: Delivered the CCR to the California Public Utilities Commission

This form is provided as a convenience for use to meet the certification requirement of the California Code of Regulations, section 64483(c).

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX I

Drought Management Plan

San Luis Water District
Drought Management Plan

This Drought Management Plan (Plan) details how San Luis Water District (SLWD) will prepare for droughts and manage water supplies during drought conditions. This Plan was prepared to comply with Governor Brown's Executive Order B-29-15 on April 1, 2015, directing agricultural water suppliers to include a detailed Drought Management Plan as part of their Agricultural Water Management Plans.

Water Supplies for San Luis Water District

SLWD has a contract for an annual supply of 125,080 acre-feet (AF) of Central Valley Project (CVP) water. This supply is dependent upon the delivery of such water by the U.S. Bureau of Reclamation (Bureau) to the District, and is subject to shortages imposed by the Bureau. The District acquires other water supplies as needed through transfers and exchanges with other water agencies, usually at a significant cost.

The Bureau contract is SLWD's only long-term water supply. SLWD does not own any groundwater wells and has no other long-term contracts for surface- or ground-water supplies. The groundwater supply in the District is generally poor, but an estimated 10,000 AF/year are pumped annually from private wells.

Water Supply Issues

Recent Endangered Species Act impacts have sharply constrained Delta pumping and reduced water supplies from the District's long-term CVP contract, causing a "regulatory drought". Modeling indicates that implementing the biological opinions and restricting Delta pumping have reduced CVP allocations to SLWD from a historic average of around 81,000 AF to about 30,000 AF or less. These water shortage issues are severely exacerbated during climatological droughts. In fact, during the past three years, the District has received 0% of its CVP contract water supply, necessitating that the District operate under extreme drought conditions. Over 70% of the District is planted in high value permanent crops, resulting in a hardened water demand each year, and limited ability to fallow land in dry years. The acquisition of Supplemental water has always been used extensively by SLWD; however the projected decreases in average CVP allocations will likely increase the cost and reduce the availability of waters available for sale.

Water Shortage Allocation Policy

The available water supply is allocated on a pro-rata acreage basis to all eligible parcels whose owners have requested an allocation for that particular year, and are not delinquent on any payments. SLWD's water service contract requires that all agricultural water that is converted to M&I use be treated as an agricultural supply in the event of a water shortage. Consequently, all parcels within SLWD are generally treated equally for allocation purposes. The one exception to this is the Bureau's practice during recent water shortage years of allocating SLWD a quantity of M&I water based on "historical" M&I usage prior to 1990. When this has occurred, SLWD has generally maintained this same distinction when allocating water to property. No preference is given based on the type of crop being grown.

Under severe water shortages, growers are almost entirely dependent upon supplemental water acquired by SLWD. In the event that the volume of supplemental water available won't be able to satisfy the volume requested, the supplemental water is divided up based on the amount of land owned and/or leased by each applicant.

Determination of Drought Severity

The drought severity is measured through a combination of 1) SLWD CVP allocation; 2) local annual rainfall; and 3) general statewide drought conditions. The District's CVP allocation is the best measure of water supply conditions, since it directly impacts how much surface water the District receives. The Bureau notifies the District each year in advance of the irrigation season of the District's contractual supply available. The Bureau may specify a quantity for agricultural use and a quantity for M&I use. This information is typically initially provided in late January and then is adjusted as hydrologic conditions or changes in pumping restrictions occur. The initial water supply allocation made by the Bureau is usually very conservative. This information allows the District to begin planning for water shortages. The allocation can range from 0% to 100%, with long-term averages expected to be less than 50% of the contract amount. A low allocation can also be the result of biological decisions resulting in pumping restrictions in the Delta, and not necessarily reflect dry or drought conditions. Local rainfall is also a general measure of the amount of residual soil moisture and effective precipitation that impacts the amount and timing of required irrigations. General statewide drought conditions (rainfall, snowpack, reservoir levels, etc.) can indicate the availability of water that may be for sale as well as provide an indication of the prices of supplemental water that may be purchased by SLWD.

Policy for Declaring Drought and Implementing Plan

SLWD generally does not determine whether drought conditions exist, as that would be more applicable to a District that manages a reservoir and controls releases. As a CVP contractor, the District's annual water supply allocation is determined by the Bureau, and the District has virtually no ability to change the available water supply for a given year other than to carryover some water from the previous year in accordance with the rescheduling policies of the Bureau. The final water supply allocation available to the District is often not known until July. Each time the water supply allocation is changed by the Bureau, the District will notify all water users so they can plan accordingly.

The District also regularly informs growers of local and statewide hydrologic conditions. At the beginning of each water year, the District holds an annual grower workshop usually around January-February to discuss allocations, supplemental water supply, and any issues that may impact growers. The District also maintains a group email system for all growers and consistently communicates important water supply information. In addition, the District conducts at least 4-5 direct mailings/year alerting growers of water supply opportunities, new rules and regulations, water conservation concepts, etc.

Operational Adjustments to Drought

Due to the District's consistent limited allocation from the Bureau, and the high value of the agricultural water that is acquired beyond the District's allocation, the District must operate the distribution system very tight to minimize losses of the valuable resource. Furthermore, the District's infrastructure includes lined canals, pipelines and spill collection and pumpback systems to eliminate any losses. As a result, the District operates like it is always in drought conditions. Any operational adjustment to drought would include the additional acquisition of supplemental water beyond that which is typically needed were the District to receive a substantial allocation.

Multi-Year Lease Program. The District exercises a Multi-Year Lease Program, whereby landowners transfer their water rights to the District for either three or five years in return for an annual payment of $40 per acre. The result is a guaranteed annual income per acre to participating landowners, regardless of the Bureau allocation, and without the obligation to pay for their water allocation. In turn this water is made available to higher value crops.

Internal Water Transfer Program. Growers are allowed to internally transfer water from one property/grower to another with District approval. This helps to redistribute the water to better match supplies and demands.

Establishment of an Incidental Supplemental Pool. Annually, the General Manger establishes an Incidental Pool of Supplemental Water not to exceed 50 AF at any one time. Such water is used to service small unanticipated demands such as those that might occur for construction water, stock water, accidental excess usage or other unanticipated events. This helps to guarantee a minimum water supply for important, unanticipated uses.

Demand Management Measures

The District is fully developed and already has a mature water conservation program since the District is water short most of the time. A large majority of lands use high efficiency drip or micro-spray systems, and most of the District's conveyance facilities are either pipelines or lined canals. The District continues to look for ways to conserve water, but the potential for improvements is considered fairly limited. The General Manager has the authority to immediately terminate water deliveries to any water user that is wasting water. However, the limited quantity of extremely expensive water available to SLWD water users has virtually eliminated wasteful use and the need to exercise this authority.

Alternative Water Supplies

SLWD could not survive without the importation of supplemental supplies. Historically those supplies augmented the District's CVP allocations. In recent years, that trend has been reversed and the majority of the District's supplies are imported from sources other than its long term CVP contract. Both the District and individual growers must aggressively pursue other water supplies to avoid loss of permanent crops. These

transfers are especially important in droughts. Most of the transfers into SLWD are for a single year only and cannot be relied upon as a long-term supply. As a result, SLWD has established an extensive network of contacts and relationships with other agencies that may be willing to sell water.

Stages of Action

The District has three levels of Drought for agricultural water supplies, which are based on CVP allocation. They include:

Stage 1 – Drought: <50% CVP allocation
Stage II – Severe Drought: <25% CVP allocation
Stage III – Extreme Drought: <10% CVP allocation

These stages help to communicate the anticipated water shortage, and the reliance the District will have on imported water purchases.

Coordination and Collaboration

The District frequently coordinates and communicates with other water agencies on drought conditions, and water supply options. These include neighboring water agencies, and agencies within the San Luis & Delta-Mendota Water Authority. The District has established an extensive network of contacts and relationships with other agencies in their efforts to find water for transfers and exchanges.

Impact of Drought on Revenues

The District collects revenue through both acreage based assessments and volumetric water charges based on the quantity of water delivered, measured in acre-feet. The District's rates are mostly volumetric and are maintained as a pass-through to landowners with the exception of a volumetric administration charge. However, the District maintains healthy reserves which provides for rate stabilization. The volumetric water rate is established each year to cover projected expenditures that exceed the revenue collected through acreage based assessments. The water rate is based on a melded rate of the various water supplies available to the District. As needed the District adjusts rates to cover the cost for water and operations. In below normal and drought years, the District will minimize expenditures as much as possible to reduce operating costs.

Process for Updating Drought Management Plan

This Drought Management Plan will be reviewed and updated at least every five years, in compliance with State deadlines for Agricultural Water Management Plans. If important policies or programs are adopted that should be reflected in the Plan, then they will be added in January of each year.

Future Actions to Improve Drought Preparedness

The District is exploring options to increase their firm water supply and reduce water shortages, including blending drainage water from Charleston Drainage District with

District water supplies. This would provide a reliable supply of recycled water, even in drought years.

SAN LUIS WATER DISTRICT POLICIES

POLICY TITLE: **Allocating Supplemental Water**

POLICY NUMBER: 3002

EFFECTIVE DATE: March 5, 2015

PURPOSE: Clarify procedures for determining the allocation of District acquired Supplemental Water, when requests exceed the available Supplemental Water.

BACKGROUND:

The District routinely acquires Supplemental Water to augment water supplies for some of its Ag and M&I customers. District customers, who wish to participate in the Supplemental Water program, submit applications requesting Supplemental Water.

As prescribed in District Rules and Regulations, "In the event Supplemental Water acquired by the District is less than the total requested, the available Supplemental Water shall be proportionately allocated based on the amount of land owned and/or leased by each applicant."

POLICY:

When the Supplemental Water acquired by the District is less than the total requested, the District shall apply the following procedures to determine each applicant's proration:

1. The total acreage used to allocate Supplemental Water to individual applicants shall be determined by the District in reliance upon any or all the following records:
    a. RRA forms
    b. District Billing Records
    c. A lease executed by the lessor and lessee

2. Only acreage for which the District's standby charge is assessed will be counted for purposes of allocating Supplemental Water. Likewise, acreage on which water and standby charges have been stacked will be counted in proportion to the standby charges assessed those lands.

3. Supplemental Water may be applied only to lands owned and or leased by the applicant.

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX J

Crop Water Needs Analysis

SAN LUIS WATER DISTRICT

CROP WATER NEEDS ANALYSIS

1989 & 1998

Prepared For:

SAN LUIS WATER DISTRICT

P.O. Box 2135
Los Banos, California 93635

Prepared By:

STODDARD & ASSOCIATES
CIVIL ENGINEERS
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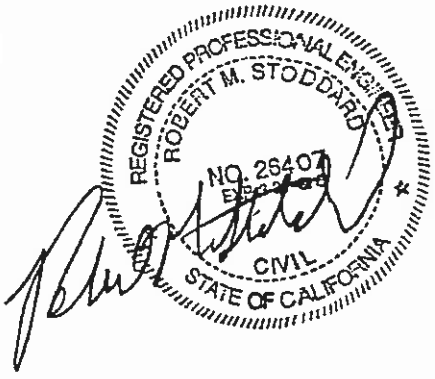

SEPTEMBER 1999

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ADMINISTRATIVE DRAFT

SAN LUIS WATER DISTRICT

CROP WATER NEEDS ANALYSIS

1989 & 1998

I. INTRODUCTION

A. The purpose of this study was to quantify the crop water needs for the San Luis Water District (the District) for the years of 1989 and 1998.

B. This report summarizes the methods used to quantify the components of crop water demand. A summary of the demand for each year, calculated on a crop year (October of the previous year through September of that year), water year (March of that year through February of the following year), and calendar year (January through December), can be found in Appendix A.

C. The study area was divided into two sub-basins, including the Northern and Southern Sub-basins. These sub-basins were selected with consideration given to district location relative to availability of daily evapotranspiration data.

II. WATER DEMAND COMPONENTS

A. CROPPING PATTERNS

1. Crop Categories

In order to standardize the reporting of acreage, the U.S. Bureau of Reclamation's crop reporting methodology was used. A final list of twenty-two crop categories or FDR's (Columns A and B, Appendix A)

was derived from consolidating a larger list of approximately eighty-six categories. Crops included in each final category have similar leaching requirements and consumptive use requirements. A complete list of the crop categories can be found in Appendix B.

2. 1989 and 1998 Irrigated Acreage Data

Irrigated acreage data were gathered directly from the District for each of the subject years (Column D, Appendix A).

B. REFERENCE EVAPOTRANSPIRATION VALUES

1. Reference evapotranspiration (ETo) is used to estimate the evapotranspiration of a reference crop. It supplies information about the water lost from the soil surface (evaporation) and the amount of water used by plants (transpiration) for grass which is well watered, closely clipped, actively growing, and completely shading the soil.

2. In this study, 1989 and 1998 ETo values were obtained from the California Irrigation Management Information System (CIMIS) database in Sacramento. Daily ETo data were downloaded and totaled monthly from October of the previous year through February of the following year. Any missing daily ETo data were estimated by taking the average of the adjacent days.

3. 1989 and 1998 ETo Data

Three representative CIMIS weather stations were chosen in order to gather daily ETo data for each of the two sub-basins.

1989

- Northern Sub-Basin: Station #56 (Los Banos)
- Southern Sub-Basin: Station #40 (Mendota Dam)

1998

- Northern Sub-Basin: Station #56 (Los Banos)
- Southern Sub-Basin: Station #105 (Tranquillity)

The monthly data from the Northern and Southern Sub-Basis were then averaged to obtain representative monthly ETo values for the District, which were the ETo values used for the remainder of the computations. A summary of the ETo data for each year can be found in Appendix C.

C. CROP COEFFICIENTS

The crop coefficient (Kc) is a dimensionless number that is multiplied by the monthly ETo value to arrive at the crop evapotranspiration (ETc) estimate. Average monthly crop coefficients were derived from various sources including California State Water Resources Control Board Report 84-1 (Pettygrove et al., 1984), Jensen, et al. (1990), Cal Poly (1994), and UC Leaflet 21428, (1989). The same monthly Kc values were applied to both sub-basins and both years, assuming that the variability in Kc values due to change in geographical locations has negligible significance on the overall water demand calculation. A table summarizing monthly Kc's used in this study and explanations on the derivation of each can be found in Appendix D.

D. CROP EVAPOTRANSPIRATION

The monthly ETc for each of the twenty-two crop categories was derived by calculating the product of the monthly ETo and Kc values (Appendix E). The annual ETc was then tabulated by summing the monthly ETc values. This data

was compiled on a crop year, water year, and calendar year basis. Summary tables of the estimated yearly ETc values for 1989 and 1998 can be found in Appendix F, and can also be found in Column E, Appendix A.

E. ANNUAL CROP CONSUMPTIVE USE

The annual crop consumptive use (CU) is the volume of water required by the crop during the growing season for full potential under the given growing environment. The annual CU in acre-feet of an individual crop is calculated by multiplying the ETc of the crop by the irrigated acreage and converting from acre-inches to acre-feet (Column F, Appendix A).

F. EFFECTIVE PRECIPITATION

1. Effective precipitation (Ep) is defined as the amount of rainfall that infiltrates into the ground and is used by crops, or aids in the leaching of salts from the crop root zone. There are numerous approaches used in estimating Ep. In this study, the California DWR methodology (DWR, 1989) of estimating Ep at 50% of the total annual rainfall was utilized (Appendix C & Column G, Appendix A). This procedure may slightly over-estimate the amount of rainfall that is effective. The amount of total rainfall that actually infiltrates into the soil will vary widely depending upon geography, soil, and surface conditions.

2. In this study, 1989 and 1998 precipitation values were obtained from the CIMIS database in Sacramento. Daily precipitation data were downloaded and totaled monthly for October of the previous year through February of the following year for both sub-basins. The average of the Northern and Southern Sub-basins was used for the District precipitation values. A summary of the precipitation data by month and by sub-basin for each year

can be found in Appendix C. The CIMIS stations used to gather the ETo data were also used to gather precipitation data.

3. The volume of effective precipitation by crop was calculated for the District by multiplying the Ep by the irrigated acreage and converting from acre-inches to acre-feet (Column H, Appendix A).

G. LEACHING REQUIREMENTS

1. The leaching requirement (LR) is the amount of water applied to maintain viable irrigated agriculture. This water requirement is in excess of crop consumptive use and is necessary to maintain soil salinity at acceptable levels. The LR depends on the salinity of the irrigation water (ECw) and the salt tolerance of the crop. If leaching is inadequate, salt can accumulate within the root zone. The only means of controlling root zone salinity is to ensure a net downward flow of water through the crop root zone.

2. In this study, irrigation water quality most representative of the average water quality of the delivered water (Appendix A) was obtained from the District and the California Data Exchange Center's (CDEC) web site, sponsored by the California Department of Water Resources.

3. Threshold values of soil salinity (ECe) for the various crop categories were obtained from Tanji (1990) and Ayers (1977) (Column C, Appendix A).

4. The additional water required for leaching, (expressed as a portion of the infiltrated water), of individual crops was calculated using the following equation. (Schwab et al, 1993)

$$LR = ECw/[5(ECe) - ECw]$$

where: ECw and ECe are in dS/m

The LR was then multiplied by the ETc to arrive at the depth of water (Column I, Appendix A) required for sufficient leaching for each crop. The LR depth was then multiplied by the irrigated acreage and converted from acre-inches to acre-feet, which resulted in the volume of water required for leaching (Column J, Appendix A).

H. CULTURAL PRACTICES

1. A cultural practice is the amount of additional water required by crops, in excess of crop consumptive use and leaching requirements. Cultural practices are crop specific practices or practices inherent to a location as a result of a pre-existing condition. Such practices may include frost protection for subtropical orchards, pre-harvest irrigation for garlic, seed germination for tomatoes, or control of certain pests.

2. Records of water deliveries for cultural practice needs were requested from the District for 1989 and 1998. In both years, these volumes were reported as zero (Column K and L, Appendix A).

I. CROP WATER NEEDS

1. The total crop water (CW) need in inches for each crop (Column M, Appendix A) was calculated as the summation of the ETc, the LR, and the CP, less the Ep. This depth was multiplied by the irrigated acreage and converted from acre-inches to acre-feet to arrive at the volume of water needed to sustain each crop (Column N, Appendix A).

III. WATER NEEDS SUMMARY

A. The total crop water demand for 1989, with slightly below average rainfall, ranged from 115,484 AF for the crop year versus 119,707 AF for the calendar year. This disparity of 4,223 AF can be accounted for by the slight variation in ETo and Ep data by month.

B. The crop water needs analysis for 1998 (the record wettest year), yielded a larger range of demand, ranging from 66,821 AF in the crop year to 83,700 AF in the water year. This 16,879 AF difference mainly stems from the diversity in monthly precipitation data. Approximately 19 inches of precipitation was recorded for the crop year and only 11 inches for the water year. A significant amount of rainfall was recorded in February of 1998, and thus was not included in the water year precipitation total. Therefore, the water year Ep was notably lower than the crop year, yielding a higher crop water demand.

C. This analysis delineates the importance of the type of year (relative to rainfall) and its impact on the crop water needs. The 42,000 AF decrease in crop water demand from 1989 to 1998 results fairly proportionately from the increased Ep and the decreased ETo data. Also, note this large variability exists despite the substantial increase in irrigated and deciduous acres from 1989.

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CROP WATER NEEDS SUMMARIES

9/24/99

SAN LUIS WATER DISTRICT

CROP YEAR 1969

SUPPLY WATER QUALITY	SOURCE %	SOURCE ECw,dS/m
DMC	21	0.62
SLC	71	0.33
SJR	0	
WELLS	8	0.90
TOTAL	100	
WEIGHTED ECw		0.44

A	B	C	D	E	F	G	H	I	J	K	L	M	N
FDR #	CROP	ECe dS/m	AREA ACRES	CROP CON. USE INCHES	CROP CON. USE AC.FT.	EFF. PRECIPITATION INCHES	EFF. PRECIPITATION AC.FT.	LEACHING REQMT INCHES	LEACHING REQMT AC.FT.	CULTURAL PRACT. INCHES	CULTURAL PRACT. AC.FT.	CROP WATER INCHES	CROP WATER AC.FT.
1	ALFALFA	2.0	6,001	52.36	26,187	3.43	1,717	2.39	1,195	0.00	0	51.32	25,665
2	ALMONDS												
	YEAR 1	1.5	250	11.29	235	3.43	72	0.70	15	0.00	0	8.56	178
	YEAR 2	1.5	80	27.60	184	3.43	23	1.71	11	0.00	0	25.88	173
	YEAR 3	1.5	100	38.48	321	3.43	29	2.38	20	0.00	0	37.42	312
	MATURE	1.5	1,989	41.82	6,932	3.43	569	2.58	428	0.00	0	40.98	6,792
3	BARLEY	8.0	802	17.84	1,192	3.43	229	0.20	13	0.00	0	14.60	976
4	BEANS(DRY)	1.0	2,762	22.97	5,288	3.43	790	2.20	508	0.00	0	21.73	5,002
5	CORN(FIELD)	1.7	713	30.78	1,828	3.43	204	1.67	99	0.00	0	29.01	1,724
6	COTTON	7.7	17,362	33.57	48,619	3.43	4,972	0.38	558	0.00	0	30.52	44,205
7	DECIDUOUS ORCHARDS												
	YEAR 1	1.5	126	11.71	123	3.43	38	0.72	8	0.00	0	9.00	94
	YEAR 2	1.5	158	28.61	377	3.43	45	1.77	23	0.00	0	26.95	355
	YEAR 3	1.5	0	39.69	0	3.43	0	2.46	0	0.00	0	36.92	0
	MATURE	1.5	1,847	43.35	6,673	3.43	528	2.68	412	0.00	0	42.60	6,557
8	GRAIN SORGHUM(MILO)	4.0	0	20.34	0	3.43	0	0.45	0	0.00	0	17.36	0
9	GRAINS	7.0	74	19.63	121	3.43	21	0.25	2	0.00	0	16.44	101
10	MELONS	2.2	6,590	19.23	10,559	3.43	1,885	0.79	436	0.00	0	16.59	9,111
11	MISC. TRUCK FIELD CROPS(HIGH)	2.0	0	37.89	0	3.43	0	1.73	0	0.00	0	36.19	0
12	MISC. TRUCK FIELD CROPS(LOW)	1.7	0	16.00	0	3.43	0	0.87	0	0.00	0	13.44	0
13	MISC. TRUCK FIELD CROPS(MED)	1.5	899	26.95	2,019	3.43	257	1.67	125	0.00	0	25.18	1,886
14	NURSERY/LETTUCE	1.3	0	8.00	0	3.43	0	0.58	0	0.00	0	5.14	0
15	PASTURE(IMPROVED)	2.8	136	52.16	591	3.43	39	1.68	19	0.00	0	50.40	571
16	POTATOES	1.6	0	23.63	0	3.43	0	1.38	0	0.00	0	21.57	0
17	RICE	2.8	0	49.97	0	3.43	0	1.81	0	0.00	0	48.14	0
18	SUBTROPICAL ORCHARDS												
	YEAR 1	1.7	43	10.39	37	3.43	12	0.56	2	0.00	0	7.52	27
	YEAR 2	1.7	0	25.41	0	3.43	0	1.38	0	0.00	0	23.35	0
	YEAR 3	1.7	145	35.41	428	3.43	41	1.92	23	0.00	0	33.90	410
	MATURE	1.7	411	38.49	1,318	3.43	118	2.08	71	0.00	0	37.15	1,272
19	SUGAR BEETS	7.0	654	40.36	2,200	3.43	187	0.51	28	0.00	0	37.44	2,040
20	TOMATOES	2.5	1,927	31.12	4,997	3.43	551	1.13	181	0.00	0	26.81	4,628
21	VINEYARD												
	YEAR 1	1.5	0	8.09	0	3.43	0	0.50	0	0.00	0	5.16	0
	YEAR 2	1.5	0	18.79	0	3.43	0	1.22	0	0.00	0	17.58	0
	YEAR 3	1.5	0	27.58	0	3.43	0	1.70	0	0.00	0	25.85	0
	MATURE	1.5	1,205	29.98	3,011	3.43	345	1.85	186	0.00	0	28.40	2,852
22	WHEAT	6.0	470	17.34	679	3.43	134	0.26	10	0.00	0	14.16	555
	TOTALS		44,764		123,918		12,804		4,371		0		115,484

9/24/89

SAN LUIS WATER DISTRICT

WATER YEAR 1989

SUPPLY WATER QUALITY	SOURCE %	SOURCE ECw,dS/m
DMC	20	0.62
SLC	72	0.33
SJR	0	
WELLS	8	0.90
TOTAL	100	
WEIGHTED ECw		0.43

A	B	C	D	E	F	G	H	I	J	K	L	M	N
FDR #	CROP	ECe dS/m	AREA ACRES	CROP CON. USE INCHES	CROP CON. USE AC.FT.	EFF. PRECIPITATION INCHES	EFF. PRECIPITATION AC.FT.	LEACHING REQM'T INCHES	LEACHING REQM'T AC.FT.	CULTURAL PRACT. INCHES	CULTURAL PRACT. AC.FT.	CROP WATER INCHES	CROP WATER AC.FT.
1	ALFALFA	2.0	6,001	53.05	26,529	3.25	1,627	2.40	1,202	0.00	0	52.20	26,105
2	ALMONDS												
	YEAR 1	1.5	250	11.36	237	3.25	68	0.70	15	0.00	0	8.81	183
	YEAR 2	1.5	80	27.77	185	3.25	22	1.70	11	0.00	0	26.22	175
	YEAR 3	1.5	100	38.71	323	3.25	27	2.38	20	0.00	0	37.83	315
	MATURE	1.5	1,989	42.08	6,974	3.25	539	2.58	428	0.00	0	41.41	6,863
3	BARLEY	8.0	802	17.77	1,188	3.25	217	0.18	13	0.00	0	14.71	983
4	BEANS(DRY)	1.0	2,762	22.97	5,288	3.25	749	2.18	502	0.00	0	21.90	5,040
5	CORN(FIELD)	1.7	713	30.78	1,829	3.25	193	1.65	98	0.00	0	29.18	1,734
6	COTTON	7.7	17,382	33.62	48,701	3.25	4,711	0.38	555	0.00	0	30.75	44,545
7	DECIDUOUS ORCHARDS												
	YEAR 1	1.5	126	11.85	124	3.25	34	0.73	8	0.00	0	9.32	98
	YEAR 2	1.5	158	28.97	381	3.25	43	1.78	23	0.00	0	27.49	362
	YEAR 3	1.5	0	40.38	0	3.25	0	2.48	0	0.00	0	39.60	0
	MATURE	1.5	1,847	43.89	6,755	3.25	501	2.69	415	0.00	0	43.33	8,669
8	GRAIN SORGHUM(MILO)	4.0	0	20.56	0	3.25	0	0.46	0	0.00	0	17.76	0
9	GRAINS	7.0	74	19.56	121	3.25	20	0.25	2	0.00	0	16.55	102
10	MELONS	2.2	6,590	19.23	10,559	3.25	1,788	0.79	433	0.00	0	16.76	9,206
11	MISC. TRUCK FIELD CROPS(HIGH)	2.0	0	36.24	0	3.25	0	1.73	0	0.00	0	36.72	0
12	MISC. TRUCK FIELD CROPS(LOW)	1.7	0	16.01	0	3.25	0	0.86	0	0.00	0	13.62	0
13	MISC. TRUCK FIELD CROPS(MED)	1.5	899	27.13	2,032	3.25	244	1.66	125	0.00	0	25.54	1,913
14	NURSERY/LETTUCE	1.3	0	8.01	0	3.25	0	0.57	0	0.00	0	5.33	0
15	PASTURE(IMPROVED)	2.8	136	52.85	599	3.25	37	1.69	19	0.00	0	51.28	581
16	POTATOES	1.6	0	23.63	0	3.25	0	1.35	0	0.00	0	21.74	0
17	RICE	2.8	0	50.04	0	3.25	0	1.60	0	0.00	0	48.39	0
18	SUBTROPICAL ORCHARDS												
	YEAR 1	1.7	43	10.47	38	3.25	12	0.56	2	0.00	0	7.78	28
	YEAR 2	1.7	0	25.58	0	3.25	0	1.38	0	0.00	0	23.70	0
	YEAR 3	1.7	145	35.66	431	3.25	39	1.92	23	0.00	0	34.32	415
	MATURE	1.7	411	38.76	1,328	3.25	111	2.08	71	0.00	0	37.59	1,288
19	SUGAR BEETS	7.0	654	40.36	2,200	3.25	177	0.51	28	0.00	0	37.61	2,050
20	TOMATOES	2.5	1,927	31.12	4,997	3.25	522	1.12	180	0.00	0	28.88	4,654
21	VINEYARD												
	YEAR 1	1.5	0	8.17	0	3.25	0	0.50	0	0.00	0	5.42	0
	YEAR 2	1.5	0	19.88	0	3.25	0	1.23	0	0.00	0	17.98	0
	YEAR 3	1.5	0	27.85	0	3.25	0	1.71	0	0.00	0	26.31	0
	MATURE	1.5	1,205	30.28	3,040	3.25	327	1.86	187	0.00	0	28.88	2,900
22	WHEAT	6.0	470	17.28	677	3.25	127	0.25	10	0.00	0	14.29	560
	TOTALS		44,764		124,534		12,133		4,368		0		116,769

8/24/99

SAN LUIS WATER DISTRICT

CALENDAR YEAR 1969

SUPPLY WATER QUALITY	SOURCE %	SOURCE ECw,dS/m
DMC	20	0.62
SLC	72	0.33
SJR	0	
WELLS	8	0.90
TOTAL	100	
WEIGHTED ECw		0.43

A	B	C	D	E	F	G	H	I	J	K	L	M	N
FDR #	CROP	ECe dS/m	AREA ACRES	CROP CON. USE INCHES	CROP CON. USE AC.FT.	EFF. PRECIPITATION INCHES	EFF. PRECIPITATION AC.FT.	LEACHING REQM'T INCHES	LEACHING REQM'T AC.FT.	CULTURAL PRACT. INCHES	CULTURAL PRACT. AC.FT.	CROP WATER INCHES	CROP WATER AC.FT.
1	ALFALFA	2.0	6,001	53.20	26,602	2.49	1,245	2.41	1,208	0.00	0	53.12	26,562
2	ALMONDS												
	YEAR 1	1.5	250	11.36	237	2.49	52	0.70	15	0.00	0	9.57	199
	YEAR 2	1.5	80	27.77	185	2.49	17	1.70	11	0.00	0	26.98	180
	YEAR 3	1.5	100	38.71	323	2.49	21	2.38	20	0.00	0	38.60	322
	MATURE	1.5	1,989	42.08	6,974	2.49	413	2.58	428	0.00	0	42.17	6,989
3	BARLEY	6.0	802	17.89	1,196	2.49	166	0.20	13	0.00	0	15.60	1,042
4	BEANS(DRY)	1.0	2,762	22.97	5,286	2.49	573	2.18	502	0.00	0	22.66	5,215
5	CORN(FIELD)	1.7	713	30.78	1,829	2.49	148	1.65	88	0.00	0	29.95	1,779
6	COTTON	7.7	17,382	33.62	48,701	2.49	3,607	0.38	555	0.00	0	31.51	45,849
7	DECIDUOUS ORCHARDS												
	YEAR 1	1.5	126	11.85	124	2.49	26	0.73	8	0.00	0	10.09	106
	YEAR 2	1.5	158	28.97	381	2.49	33	1.78	23	0.00	0	28.25	372
	YEAR 3	1.5	0	40.38	0	2.49	0	2.48	0	0.00	0	40.37	0
	MATURE	1.5	1,847	43.89	6,755	2.49	383	2.69	415	0.00	0	44.09	6,787
8	GRAIN SORGHUM(MILO)	4.0	0	20.56	0	2.49	0	0.46	0	0.00	0	18.52	0
9	GRAINS	7.0	74	19.65	121	2.49	15	0.25	2	0.00	0	17.40	107
10	MELONS	2.2	6,590	19.23	10,559	2.49	1,387	0.79	433	0.00	0	17.53	9,625
11	MISC. TRUCK FIELD CROPS(HIGH)	2.0	0	38.33	0	2.49	0	1.74	0	0.00	0	37.57	0
12	MISC. TRUCK FIELD CROPS(LOW)	1.7	0	16.00	0	2.49	0	0.86	0	0.00	0	14.37	0
13	MISC. TRUCK FIELD CROPS(MED)	1.5	899	27.16	2,035	2.49	187	1.67	125	0.00	0	28.34	1,973
14	NURSERY/LETTUCE	1.3	0	8.00	0	2.49	0	0.57	0	0.00	0	6.08	0
15	PASTURE(IMPROVED)	2.8	136	53.06	601	2.49	28	1.70	19	0.00	0	52.27	592
16	POTATOES	1.6	0	23.63	0	2.49	0	1.35	0	0.00	0	22.50	0
17	RICE	2.8	0	50.04	0	2.49	0	1.60	0	0.00	0	49.15	0
18	SUBTROPICAL ORCHARDS												
	YEAR 1	1.7	43	10.47	38	2.49	9	0.56	2	0.00	0	8.54	31
	YEAR 2	1.7	0	25.58	0	2.49	0	1.38	0	0.00	0	24.47	0
	YEAR 3	1.7	145	35.66	431	2.49	30	1.92	23	0.00	0	35.09	424
	MATURE	1.7	411	38.76	1,328	2.49	85	2.08	71	0.00	0	38.35	1,314
19	SUGAR BEETS	7.0	654	40.36	2,200	2.49	138	0.51	28	0.00	0	38.38	2,091
20	TOMATOES	2.5	1,927	31.12	4,997	2.49	400	1.12	180	0.00	0	29.74	4,776
21	VINEYARD												
	YEAR 1	1.5	0	8.17	0	2.49	0	0.50	0	0.00	0	6.18	0
	YEAR 2	1.5	0	19.98	0	2.49	0	1.23	0	0.00	0	18.72	0
	YEAR 3	1.5	0	27.85	0	2.49	0	1.71	0	0.00	0	27.07	0
	MATURE	1.5	1,205	30.28	3,040	2.49	250	1.86	187	0.00	0	29.64	2,977
22	WHEAT	6.0	470	17.38	681	2.49	98	0.25	10	0.00	0	15.14	593
	TOTALS		44,764		124,624		9,289		4,372		0		119,707

9/24/99

SAN LUIS WATER DISTRICT

CROP YEAR 1998

SUPPLY WATER QUALITY	SOURCE %	SOURCE ECw,dS/m	
DMC	17	0.30	
SLC	83	0.30	* quality assumed
SJR			
WELLS			
TOTAL	100		
WEIGHTED ECw		0.30	

A	B	C	D	E	F	G	H	I	J	K	L	M	N
FDR #	CROP	ECe dS/m	AREA ACRES	CROP CON. USE INCHES	CROP CON. USE AC.FT.	EFF. PRECIPITATION INCHES	EFF. PRECIPITATION AC.FT.	LEACHING REQM'T INCHES	LEACHING REQM'T AC.FT.	CULTURAL PRACT. INCHES	CULTURAL PRACT. AC.FT.	CROP WATER INCHES	CROP WATER AC.FT.
1	ALFALFA	2.0	2,165	46.23	8,341	9.61	1,734	1.43	258	0.00	0	38.05	6,866
2	ALMONDS												
	YEAR 1	1.5	1,761	10.14	1,489	9.61	1,410	0.42	62	0.00	0	0.96	141
	YEAR 2	1.5	2,377	24.80	4,912	9.61	1,904	1.03	205	0.00	0	16.22	3,213
	YEAR 3	1.5	747	34.57	2,152	9.61	598	1.44	90	0.00	0	26.40	1,643
	MATURE	1.5	2,911	37.57	9,115	9.61	2,331	1.57	380	0.00	0	29.53	7,163
3	BARLEY	8.0	721	12.98	780	9.61	577	0.10	6	0.00	0	3.47	209
4	BEANS(DRY)	1.0	2,048	19.73	3,367	9.61	1,640	1.26	215	0.00	0	11.38	1,942
5	CORN(FIELD)	1.7	655	28.05	1,531	9.61	525	1.03	56	0.00	0	19.47	1,063
6	COTTON	7.7	13,508	31.16	35,072	9.61	10,818	0.24	275	0.00	0	21.79	24,529
7	DECIDUOUS ORCHARDS												
	YEAR 1	1.5	156	10.71	139	9.61	125	0.45	6	0.00	0	1.55	20
	YEAR 2	1.5	40	26.18	87	9.61	32	1.09	4	0.00	0	17.66	59
	YEAR 3	1.5	65	36.49	198	9.61	52	1.52	8	0.00	0	28.40	154
	MATURE	1.5	1,472	39.66	4,865	9.61	1,179	1.65	203	0.00	0	31.71	3,889
8	GRAIN SORGHUM(MILO)	4.0	210	20.50	359	9.61	168	0.31	5	0.00	0	11.20	196
9	GRAINS	7.0	1,253	14.39	1,502	9.61	1,003	0.12	13	0.00	0	4.90	512
10	MELONS	2.2	4,923	15.90	6,523	9.61	3,943	0.45	183	0.00	0	6.74	2,763
11	MISC. TRUCK FIELD CROPS(HIGH)	2.0	100	32.78	273	9.61	80	1.01	8	0.00	0	24.18	202
12	MISC. TRUCK FIELD CROPS(LOW)	1.7	805	12.12	813	9.61	645	0.44	30	0.00	0	2.95	198
13	MISC. TRUCK FIELD CROPS(MED)	1.5	1,104	22.45	2,065	9.61	884	0.94	86	0.00	0	13.77	1,267
14	NURSERY/LETTUCE	1.3	126	6.08	64	9.61	101	0.29	3	0.00	0	-3.26	-34
15	PASTURE(IMPROVED)	2.8	39	45.59	148	9.61	31	1.00	3	0.00	0	36.86	120
16	POTATOES	1.6	0	18.46	0	9.61	0	0.72	0	0.00	0	9.57	0
17	RICE	2.8	0	44.24	0	9.61	0	0.97	0	0.00	0	35.59	0
18	SUBTROPICAL ORCHARDS												
	YEAR 1	1.7	0	9.33	0	9.61	0	0.34	0	0.00	0	0.06	0
	YEAR 2	1.7	0	22.80	0	9.61	0	0.83	0	0.00	0	14.02	0
	YEAR 3	1.7	7	31.78	19	9.61	6	1.16	1	0.00	0	23.33	14
	MATURE	1.7	1,157	34.54	3,330	9.61	927	1.26	122	0.00	0	26.19	2,525
19	SUGAR BEETS	7.0	610	36.19	1,840	9.61	489	0.31	16	0.00	0	26.89	1,367
20	TOMATOES	2.5	2,252	28.03	5,260	9.61	1,803	0.69	129	0.00	0	19.11	3,586
21	VINEYARD												
	YEAR 1	1.5	158	7.60	100	9.61	127	0.32	4	0.00	0	0.00	0
	YEAR 2	1.5	0	18.59	0	9.61	0	0.77	0	0.00	0	9.75	0
	YEAR 3	1.5	0	25.91	0	9.61	0	1.08	0	0.00	0	17.38	0
	MATURE	1.5	1,060	28.18	2,488	9.61	849	1.17	104	0.00	0	19.73	1,743
22	WHEAT	8.0	5,494	12.70	5,814	9.61	4,400	0.13	59	0.00	0	3.22	1,473
	TOTALS		47,924		102,845		38,379		2,533		0		68,821

9/24/99

SAN LUIS WATER DISTRICT

WATER YEAR 1998

SUPPLY WATER QUALITY	SOURCE %	SOURCE ECw,dS/m	
DMC	18	0.30	
SLC	82	0.30	* quality assumed
SJR			
WELLS			
TOTAL	100		
WEIGHTED ECw		0.30	

A	B	C	D	E	F	G	H	I	J	K	L	M	N
FDR #	CROP	ECe dS/m	AREA ACRES	CROP CON. USE INCHES	CROP CON. USE AC.FT.	EFF. PRECIPITATION INCHES	EFF. PRECIPITATION AC.FT.	LEACHING REQM'T INCHES	LEACHING REQM'T AC.FT.	CULTURAL PRACT. INCHES	CULTURAL PRACT. AC.FT.	CROP WATER INCHES	CROP WATER AC.FT.
1	ALFALFA	2.0	2,165	46.18	8,331	5.33	962	1.43	258	0.00	0	42.28	7,627
2	ALMONDS												
	YEAR 1	1.5	1,761	10.03	1,472	5.33	782	0.42	61	0.00	0	5.12	751
	YEAR 2	1.5	2,377	24.51	4,856	5.33	1,056	1.02	202	0.00	0	20.20	4,002
	YEAR 3	1.5	747	34.17	2,127	5.33	332	1.42	89	0.00	0	30.26	1,884
	MATURE	1.5	2,911	37.14	9,010	5.33	1,293	1.55	375	0.00	0	33.36	8,092
3	BARLEY	8.0	721	13.49	811	5.33	320	0.10	6	0.00	0	8.26	497
4	BEANS(DRY)	1.0	2,048	19.73	3,367	5.33	910	1.26	215	0.00	0	15.66	2,672
5	CORN(FIELD)	1.7	655	28.05	1,531	5.33	291	1.03	56	0.00	0	23.75	1,298
6	COTTON	7.7	13,508	31.06	34,962	5.33	6,000	0.24	275	0.00	0	25.97	29,236
7	DECIDUOUS ORCHARDS												
	YEAR 1	1.5	156	10.57	137	5.33	69	0.44	6	0.00	0	5.68	74
	YEAR 2	1.5	40	25.83	86	5.33	18	1.08	4	0.00	0	21.58	72
	YEAR 3	1.5	65	36.01	195	5.33	29	1.50	8	0.00	0	32.18	174
	MATURE	1.5	1,472	39.14	4,802	5.33	654	1.63	200	0.00	0	35.44	4,348
8	GRAIN SORGHUM(MILO)	4.0	210	20.13	352	5.33	93	0.31	5	0.00	0	15.11	264
9	GRAINS	7.0	1,253	14.89	1,555	5.33	557	0.13	13	0.00	0	9.69	1,012
10	MELONS	2.2	4,823	15.80	6,523	5.33	2,187	0.45	183	0.00	0	11.02	4,519
11	MISC. TRUCK FIELD CROPS(HIGH)	2.0	100	32.68	272	5.33	44	1.01	8	0.00	0	26.36	236
12	MISC. TRUCK FIELD CROPS(LOW)	1.7	805	12.23	821	5.33	358	0.45	30	0.00	0	7.35	493
13	MISC. TRUCK FIELD CROPS(MED)	1.5	1,104	22.46	2,068	5.33	490	0.94	86	0.00	0	16.06	1,662
14	NURSERY/LETTUCE	1.3	126	6.12	64	5.33	56	0.30	3	0.00	0	1.08	11
15	PASTURE(IMPROVED)	2.8	39	45.72	149	5.33	17	1.00	3	0.00	0	41.39	135
16	POTATOES	1.6	0	18.46	0	5.33	0	0.72	0	0.00	0	13.85	0
17	RICE	2.8	0	44.11	0	5.33	0	0.97	0	0.00	0	39.75	0
18	SUBTROPICAL ORCHARDS												
	YEAR 1	1.7	0	9.20	0	5.33	0	0.34	0	0.00	0	4.21	0
	YEAR 2	1.7	0	22.49	0	5.33	0	0.82	0	0.00	0	17.99	0
	YEAR 3	1.7	7	31.35	18	5.33	3	1.15	1	0.00	0	27.17	18
	MATURE	1.7	1,157	34.08	3,286	5.33	514	1.26	120	0.00	0	30.00	2,892
19	SUGAR BEETS	7.0	610	36.19	1,840	5.33	271	0.31	16	0.00	0	31.17	1,584
20	TOMATOES	2.5	2,252	28.03	5,260	5.33	1,000	0.69	129	0.00	0	23.39	4,389
21	VINEYARD												
	YEAR 1	1.5	158	7.51	99	5.33	70	0.31	4	0.00	0	2.49	33
	YEAR 2	1.5	0	18.35	0	5.33	0	0.76	0	0.00	0	13.78	0
	YEAR 3	1.5	0	25.58	0	5.33	0	1.07	0	0.00	0	21.31	0
	MATURE	1.5	1,060	27.80	2,458	5.33	471	1.16	102	0.00	0	23.63	2,087
22	WHEAT	6.0	5,494	13.15	6,019	5.33	2,440	0.13	61	0.00	0	7.95	3,640
	TOTALS		47,924		102,465		21,286		2,520		0		83,700

9/24/99

SAN LUIS WATER DISTRICT

CALENDAR YEAR 1998

SUPPLY WATER QUALITY	SOURCE %	SOURCE ECw,dS/m	
DMC	17	0.30	
SLC	83	0.30	* quality assumed
SJR			
WELLS			
TOTAL	100		
WEIGHTED ECw		0.30	

A	B	C	D	E	F	G	H	I	J	K	L	M	N
FDR #	CROP	ECe dS/m	AREA ACRES	CROP CON. USE INCHES	CROP CON. USE AC.FT.	EFF. PRECIPITATION INCHES	EFF. PRECIPITATION AC.FT.	LEACHING REQM'T INCHES	LEACHING REQM'T AC.FT.	CULTURAL PRACT. INCHES	CULTURAL PRACT. AC.FT.	CROP WATER INCHES	CROP WATER AC.FT.
1	ALFALFA	2.0	2,165	45.89	8,280	8.29	1,496	1.42	256	0.00	0	39.02	7,040
2	ALMONDS												
	YEAR 1	1.5	1,761	10.03	1,472	8.29	1,217	0.42	61	0.00	0	2.16	316
	YEAR 2	1.5	2,377	24.51	4,856	8.29	1,642	1.02	202	0.00	0	17.24	3,416
	YEAR 3	1.5	747	34.17	2,127	8.29	516	1.42	89	0.00	0	27.30	1,700
	MATURE	1.5	2,911	37.14	8,010	8.29	2,011	1.55	375	0.00	0	30.40	7,374
3	BARLEY	8.0	721	13.05	784	8.29	498	0.10	6	0.00	0	4.85	292
4	BEANS(DRY)	1.0	2,048	19.73	3,367	8.29	1,415	1.26	215	0.00	0	12.70	2,167
5	CORN(FIELD)	1.7	655	28.05	1,531	8.29	452	1.03	56	0.00	0	20.79	1,135
6	COTTON	7.7	13,508	31.06	34,962	8.29	9,332	0.24	275	0.00	0	23.01	25,904
7	DECIDUOUS ORCHARDS												
	YEAR 1	1.5	156	10.57	137	8.29	108	0.44	6	0.00	0	2.72	35
	YEAR 2	1.5	40	25.83	88	8.29	28	1.08	4	0.00	0	18.62	62
	YEAR 3	1.5	65	36.01	195	8.29	45	1.50	8	0.00	0	29.22	158
	MATURE	1.5	1,472	39.14	4,802	8.29	1,017	1.63	200	0.00	0	32.48	3,985
8	GRAIN SORGHUM(MILO)	4.0	210	20.13	352	8.29	145	0.31	5	0.00	0	12.15	213
9	GRAINS	7.0	1,253	14.47	1,511	8.29	866	0.13	13	0.00	0	6.31	659
10	MELONS	2.2	4,923	15.90	6,523	8.29	3,401	0.45	183	0.00	0	8.08	3,305
11	MISC. TRUCK FIELD CROPS(HIGH)	2.0	100	32.48	271	8.29	69	1.00	8	0.00	0	25.20	210
12	MISC. TRUCK FIELD CROPS(LOW)	1.7	805	12.12	813	8.29	556	0.44	30	0.00	0	4.27	287
13	MISC. TRUCK FIELD CROPS(MED)	1.5	1,104	22.30	2,052	8.29	763	0.93	85	0.00	0	14.94	1,374
14	NURSERY/LETTUCE	1.3	126	6.06	64	8.29	87	0.28	3	0.00	0	0.00	0
15	PASTURE(IMPROVED)	2.8	39	45.32	147	8.29	27	0.99	3	0.00	0	38.03	124
16	POTATOES	1.8	0	18.46	0	8.29	0	0.72	0	0.00	0	10.89	0
17	RICE	2.8	0	44.11	0	8.29	0	0.97	0	0.00	0	36.79	0
18	SUBTROPICAL ORCHARDS												
	YEAR 1	1.7	0	9.20	0	8.29	0	0.34	0	0.00	0	1.25	0
	YEAR 2	1.7	0	22.49	0	8.29	0	0.82	0	0.00	0	15.03	0
	YEAR 3	1.7	7	31.35	18	8.29	5	1.15	1	0.00	0	24.21	14
	MATURE	1.7	1,157	34.08	3,286	8.29	789	1.25	120	0.00	0	27.04	2,607
19	SUGAR BEETS	7.0	810	36.19	1,840	8.29	421	0.31	16	0.00	0	28.21	1,434
20	TOMATOES	2.5	2,252	28.03	5,260	8.29	1,556	0.69	129	0.00	0	20.43	3,834
21	VINEYARD												
	YEAR 1	1.5	158	7.51	99	8.29	109	0.31	4	0.00	0	0.00	0
	YEAR 2	1.5	0	18.35	0	8.29	0	0.76	0	0.00	0	10.82	0
	YEAR 3	1.5	0	25.58	0	8.29	0	1.07	0	0.00	0	18.35	0
	MATURE	1.5	1,060	27.80	2,456	8.29	732	1.16	102	0.00	0	20.67	1,826
22	WHEAT	6.0	5,494	12.76	5,844	8.29	3,795	0.13	59	0.00	0	4.60	2,108
	TOTALS		47,924		102,143		33,107		2,516		0		71,577

LIST OF CROP CATEGORIES

CATEGORY

ID	Name	Group Name	FDR Number
61	Alfalfa Hay	Alfalfa	1
87	Peppermint	Alfalfa	1
88	Spearmint	Alfalfa	1
181	Almonds	Almonds	2
51	Barley	Barley	3
81	Beans, dry and edible	Beans (Dry)	4
90	Soybeans	Beans (Dry)	4
52	Corn	Corn (Field)	5
65	Silage or Ensilage	Corn (Field)	5
70	Other Forage	Corn (Field)	5
82	Cotton, lint (Upland)	Cotton	6
83	Cotton, seed (Upland)	Cotton	6
84	Cotton, lint (American-Pima)	Cotton	6
85	Cotton, seed (American-Pima)	Cotton	6
161	Apples	Deciduous Orchard	7
162	Apricots	Deciduous Orchard	7
164	Cherries	Deciduous Orchard	7
178	Other fruits	Deciduous Orchard	7
182	Pecans	Deciduous Orchard	7
183	Walnuts	Deciduous Orchard	7
184	Pistachios	Deciduous Orchard	7
185	Other nuts	Deciduous Orchard	7
56	Sorghum	Grain Sorghum (Milo)	8
53	Oats	Grains	9
58	Other Cereals	Grains	9
62	Other Hay	Grains	9
111	Cucumbers	Melons	10
114	Cantalope, etc.	Melons	10
115	Honey Ball, Honeydew, etc.	Melons	10
116	Watermelon	Melons	10
124	Squash	Melons	10
101	Asparagus	Misc. Truck/Field Crops (High)	11
141	Alfalfa seed	Misc. Truck/Field Crops (High)	11
142	Clover seed (all kinds)	Misc. Truck/Field Crops (High)	11
144	Grass seed (all kinds)	Misc. Truck/Field Crops (High)	11
104	Broccoli	Misc. Truck/Field Crops (Low)	12
105	Cabbage	Misc. Truck/Field Crops (Low)	12
107	Cauliflower	Misc. Truck/Field Crops (Low)	12
112	Greens (kala, etc.)	Misc. Truck/Field Crops (Low)	12
118	Onions, green	Misc. Truck/Field Crops (Low)	12
119	Peas, green (processing)	Misc. Truck/Field Crops (Low)	12
120	Peas, green (fresh market)	Misc. Truck/Field Crops (Low)	12
126	Tomatoes (fresh market)	Misc. Truck/Field Crops (Low)	12
127	Other vegetables	Misc. Truck/Field Crops (Low)	12
145	Lettuce seed	Misc. Truck/Field Crops (Low)	12
146	Onion seed	Misc. Truck/Field Crops (Low)	12
147	Pea seed	Misc. Truck/Field Crops (Low)	12
150	Other seed	Misc. Truck/Field Crops (Low)	12

CATEGORY

ID	NAME	GROUP NAME	FDR #
88	Hops	Misc. Truck/Field Crops (Med)	13
91	Other field crops	Misc. Truck/Field Crops (Med)	13
02	Beans (processing)	Misc. Truck/Field Crops (Med)	13
03	Beans (fresh market)	Misc. Truck/Field Crops (Med)	13
106	Carrots	Misc. Truck/Field Crops (Med)	13
108	Celery	Misc. Truck/Field Crops (Med)	13
109	Corn, sweet (processing)	Misc. Truck/Field Crops (Med)	13
110	Corn, sweet (fresh market)	Misc. Truck/Field Crops (Med)	13
117	Onions, dry	Misc. Truck/Field Crops (Med)	13
121	Peppers (all kinds)	Misc. Truck/Field Crops (Med)	13
143	Corn seed	Misc. Truck/Field Crops (Med)	13
177	Strawberries	Misc. Truck/Field Crops (Med)	13
113	Lettuce	Nursery/Lettuce	14
137	Nursery	Nursery/Lettuce	14
63	Irrigated Pasture	Pasture (Improved)	15
122	Potatoes, early	Potatoes	16
123	Potatoes, late	Potatoes	16
148	Potatoe seed (all kinds)	Potatoes	16
54	Rice	Rice	17
165	Grapefruit	Subtropical Orchard	18
168	Lemons and Limes	Subtropical Orchard	18
167	Oranges and Tangerines	Subtropical Orchard	18
168	Dates	Subtropical Orchard	18
173	Olives	Subtropical Orchard	18
174	Peaches	Subtropical Orchard	18
175	Pears	Subtropical Orchard	18
176	Prunes and Plums	Subtropical Orchard	18
89	Sugar Beets	Sugar Beets	19
149	Sugar beet seed	Sugar Beets	19
126	Tomatoes (canning)	Tomatoes	20
163	Berries (all kinds)	Vineyard	21
169	Grapes, table	Vineyard	21
170	Grapes, wine	Vineyard	21
171	Grapes, raisin	Vineyard	21
172	Grapes, other	Vineyard	21
57	Wheat	Wheat	22
11	Harvested cropland and pasture	N/A	
12	Cropland not harvested	N/A	
13	Acres irrigated	N/A	
14	Fallow or idle	N/A	
15	Total area in irrig. rotation	N/A	
16	Dry cropped, idle, fallow or grazed	N/A	
17	Farmsteads, roads, ditches, drains	N/A	
18	Total area not in irrig. rotation	N/A	
19	Urban and suburban area	N/A	
20	Total irrigable area for service	N/A	
21	Total irrigable area not for service	N/A	
22	Total irrigable area	N/A	
23	Class 6 - Temporarily irrigated	N/A	

REFERENCE EVAPOTRANSPIRATION AND PRECIPITATION DATA

9/24/99

SAN LUIS WATER DISTRICT - NORTHERN SUB-BASIN

		LOS BANOS 1989		LOS BANOS 1998	
MONTH		ETo (IN)	PRECIP (IN)	ETo (IN)	PRECIP (IN)
OCTOBER		3.83	0.24	3.94	0.00
NOVEMBER		1.41	1.10	1.41	2.74
DECEMBER		1.04	1.62	0.86	2.13
JANUARY		1.64	0.55	0.65	0.44
FEBRUARY		2.33	1.18	1.25	11.42
MARCH		4.33	0.83	2.92	2.58
APRIL		5.54	0.32	4.61	0.72
MAY		7.66	0.00	5.75	3.07
JUNE		8.71	0.00	7.36	0.35
JULY		9.36	0.00	8.47	0.00
AUGUST		8.14	0.08	7.66	0.00
SEPTEMBER		5.40	1.10	5.22	0.00
OCTOBER		3.74	0.63	3.39	0.87
NOVEMBER		2.01	0.28	1.38	0.88
DECEMBER		0.96	0.08	1.04	0.68
JANUARY		1.09	1.86	0.68	2.27
FEBRUARY		2.12	1.23	1.52	1.83
Crop Year	Total	59.39	7.02	50.10	23.45
	50%		3.51		11.73
Water Year	Total	59.06	6.41	50.00	13.25
	50%		3.21		6.63
Calendar Year	Total	59.82	5.05	49.70	21.01
	50%		2.53		10.51

9/24/99

SAN LUIS WATER DISTRICT - SOUTHERN SUB-BASIN

		MENDOTA DAM		TRANQUILITY	
		1989		1998	
	MONTH	ETo (IN)	PRECIP (IN)	ETo (IN)	PRECIP (IN)
	OCTOBER	3.30	0.00	4.53	0.05
	NOVEMBER	1.59	0.67	1.62	2.65
	DECEMBER	0.94	2.13	0.86	1.43
	JANUARY	1.49	0.29	0.67	1.61
	FEBRUARY	1.70	1.15	1.17	4.04
	MARCH	3.83	0.89	2.80	1.85
	APRIL	5.75	0.13	4.89	0.95
	MAY	7.86	0.09	5.52	2.19
	JUNE	8.58	0.00	7.27	0.10
	JULY	8.95	0.00	8.57	0.00
	AUGUST	7.40	0.00	7.96	0.00
	SEPTEMBER	5.12	1.36	5.36	0.12
	OCTOBER	4.10	0.68	3.86	0.26
	NOVEMBER	2.18	0.32	1.71	0.66
	DECEMBER	1.13	0.00	1.24	0.37
	JANUARY	1.38	2.37	0.79	1.05
	FEBRUARY	2.10	0.76	1.62	0.51
Crop Year	Total	56.51	6.71	51.22	14.99
	50%		3.36		7.50
Water Year	Total	58.38	6.60	51.59	8.06
	50%		3.30		4.03
Calendar Year	Total	58.09	4.91	51.02	12.15
	50%		2.46		6.08

9/23/99

SAN LUIS WATER DISTRICT

		LB/MENDOTA 1989		LB/TRANQUILITY 1998	
	MONTH	ETo (IN)	PRECIP (IN)	ETo (IN)	PRECIP (IN)
	OCTOBER	3.57	0.12	4.24	0.03
	NOVEMBER	1.50	0.89	1.52	2.70
	DECEMBER	0.99	1.88	0.86	1.78
	JANUARY	1.57	0.42	0.66	1.03
	FEBRUARY	2.02	1.17	1.21	7.73
	MARCH	4.08	0.86	2.86	2.22
	APRIL	5.65	0.23	4.75	0.84
	MAY	7.76	0.05	5.64	2.63
	JUNE	8.65	0.00	7.32	0.23
	JULY	9.16	0.00	8.52	0.00
	AUGUST	7.77	0.04	7.81	0.00
	SEPTEMBER	5.26	1.23	5.29	0.06
	OCTOBER	3.92	0.66	3.63	0.57
	NOVEMBER	2.10	0.30	1.55	0.77
	DECEMBER	1.05	0.04	1.14	0.53
	JANUARY	1.24	2.12	0.74	1.66
	FEBRUARY	2.11	1.00	1.57	1.17
Crop Year	Total	57.95	6.87	50.66	19.22
	50%		3.43		9.61
Water Year	Total	58.72	6.51	50.80	10.66
	50%		3.25		5.33
Calendar Year	Total	58.96	4.98	50.36	16.58
	50%		2.49		8.29

CROP COEFFICIENTS AND SUPPORTING DOCUMENTATION

9/23/99

MONTHLY CROP Kc VALUES

FDR #	CROP	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT
1	ALFALFA	0.91	0.79	0.68	0.63	0.66	0.87	0.91	0.91	0.92	0.94	0.97	0.97
2	ALMONDS												
	1 YEAR	0.19	0.00	0.00	0.00	0.00	0.16	0.19	0.22	0.23	0.23	0.23	0.22
	2 YEAR	0.47	0.00	0.00	0.00	0.00	0.38	0.46	0.54	0.57	0.57	0.57	0.55
	3 YEAR	0.65	0.00	0.00	0.00	0.00	0.53	0.64	0.75	0.80	0.80	0.80	0.76
	MATURE	0.71	0.00	0.00	0.00	0.00	0.58	0.70	0.82	0.87	0.87	0.87	0.83
3	BARLEY	0.00	0.07	0.21	0.68	1.10	1.17	0.86	0.45	0.13	0.00	0.00	0.00
4	BEANS(DRY)	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.53	1.13	0.83	0.13	0.00
5	CORN(FIELD)	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.35	0.91	1.14	0.98	0.29
6	COTTON	0.16	0.00	0.00	0.00	0.00	0.00	0.10	0.37	0.74	1.14	1.13	0.75
7	DECIDUOUS ORCHARDS												
	1 YEAR	0.23	0.10	0.00	0.00	0.00	0.08	0.18	0.21	0.23	0.26	0.26	0.26
	2 YEAR	0.57	0.25	0.00	0.00	0.00	0.18	0.43	0.51	0.57	0.63	0.63	0.63
	3 YEAR	0.80	0.35	0.00	0.00	0.00	0.26	0.60	0.72	0.80	0.88	0.88	0.88
	MATURE	0.87	0.38	0.00	0.00	0.00	0.28	0.65	0.78	0.87	0.96	0.96	0.96
8	GRAIN SORGHUM(MILO)	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.36	1.13	1.05
9	GRAINS	0.00	0.00	0.31	0.57	1.05	1.19	1.15	0.64	0.00	0.00	0.00	0.00
10	MELONS	0.00	0.00	0.00	0.00	0.00	0.07	0.24	0.67	1.02	0.39	0.00	0.00
11	MISC. TRUCK FIELD CROPS(HIGH)	0.66	0.30	0.35	0.40	0.47	0.74	0.97	0.97	0.66	0.19	0.66	0.87
12	MISC. TRUCK FIELD CROPS(LOW)	0.00	0.00	0.00	0.06	0.30	0.59	1.02	0.92	0.00	0.00	0.00	0.00
13	MISC. TRUCK FIELD CROPS(MED)	0.33	0.15	0.18	0.23	0.39	0.67	1.00	0.95	0.33	0.10	0.33	0.44
14	NURSERY/LETTUCE	0.00	0.00	0.00	0.03	0.15	0.30	0.51	0.46	0.00	0.00	0.00	0.00
15	PASTURE(IMPROVED)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
16	POTATOES	0.00	0.00	0.00	0.00	0.00	0.66	1.08	1.20	0.64	0.00	0.00	0.00
17	RICE	0.20	0.00	0.00	0.00	0.00	0.10	1.00	1.15	1.27	1.23	1.15	0.59
18	SUBTROPICAL ORCHARDS												
	1 YEAR	0.20	0.00	0.00	0.00	0.00	0.15	0.18	0.21	0.22	0.22	0.22	0.16
	2 YEAR	0.50	0.00	0.00	0.00	0.00	0.36	0.45	0.51	0.53	0.53	0.53	0.38
	3 YEAR	0.69	0.00	0.00	0.00	0.00	0.51	0.63	0.71	0.75	0.75	0.75	0.53
	MATURE	0.75	0.00	0.00	0.00	0.00	0.55	0.68	0.77	0.81	0.81	0.81	0.58
19	SUGAR BEETS	0.00	0.00	0.00	0.00	0.00	0.08	0.28	0.75	1.16	1.18	1.16	0.53
20	TOMATOES	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.42	0.94	1.18	0.96	0.00
21	VINEYARD												
	1 YEAR	0.16	0.04	0.00	0.00	0.00	0.00	0.02	0.10	0.19	0.23	0.23	0.22
	2 YEAR	0.40	0.09	0.00	0.00	0.00	0.00	0.05	0.24	0.46	0.55	0.55	0.53
	3 YEAR	0.55	0.13	0.00	0.00	0.00	0.00	0.06	0.33	0.63	0.77	0.77	0.75
	MATURE	0.60	0.14	0.00	0.00	0.00	0.00	0.07	0.36	0.69	0.84	0.84	0.81
22	WHEAT	0.00	0.04	0.23	0.54	0.95	1.17	1.04	0.47	0.00	0.00	0.00	0.00

9/24/99

EXPLANATION OF THE DERIVATION OF CROP COEFFICIENT (Kc) VALUES

FRD	CROP GROUP NAME	EXPLANATION OF DERIVATION
1	ALFALFA	Average of A and C
2	ALMONDS	
	YEAR 1	27% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	YEAR 2	66% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	YEAR 3	92% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	MATURE	D (assumed initial growth date of 3/1)
3	BARLEY	C (average of fall and winter)
4	BEANS(DRY)	Average of A and B
5	CORN(FIELD)	Average of A and B
6	COTTON	Average of A and B
7	DECIDUOUS ORCHARDS	
	YEAR 1	27% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	YEAR 2	66% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	YEAR 3	92% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	MATURE	B (assumed clean cultivated)
8	GRAIN SORGHUM(MILO)	B
9	GRAINS	B
10	MELONS	Average of A and B
11	MISC. TRUCK FIELD CROPS(HIGH)	A (Assumed an established crop for the previous year and following year, estimated values for August through January)
12	MISC. TRUCK FIELD CROPS(LOW)	A (vegetables)
13	MISC. TRUCK FIELD CROPS(MED)	A (average of FDR 11 and 12)
14	NURSERY/LETTUCE	A (Assumed 0.5 * Kc's(vegetables))
15	PASTURE(IMPROVED)	A
16	POTATOES	C
17	RICE	Average of A and C
18	SUBTROPICAL ORCHARDS	
	YEAR 1	27% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	YEAR 2	66% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	YEAR 3	92% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	MATURE	Average of A and C
19	SUGAR BEETS	B
20	TOMATOES	B
21	VINEYARD	
	YEAR 1	27% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	YEAR 2	66% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	YEAR 3	92% OF THE MATURE Kc VALUE (AS PER FIGURE 3, REFERENCE D)
	MATURE	B
22	WHEAT	A

LEGEND OF REFERENCES USED

A= Cal Poly, 1994, 100% Kc values
B= Jensen, et al., 1990, Table 6.10
C= California State Water Resources Control Board, Report 84-1, Table 5-12
D= University of California, Leaflet 21428

Table 5-12. Recommended monthly crop coefficients, k_c for principal crops grown in California, as adapted from Table 5 of DWR Bull. 113-3 [7][a]. Values of k_c for relating to ET_o were derived by dividing DWR's monthly k_p data for the month and crop of interest, by the k_p for pasture for the same month. Example: Cantaloupes in June; k_c = 0.86/0.78 = 1.10.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Field Crops												
Alfalfa (hay)	1.00	1.00	0.92	0.91	0.91	0.94	0.97	1.03	1.04	1.03	1.00	1.00
Barley (fall)	0.94	1.28	1.08	0.65	0.26	-	-	-	-	-	0.14	0.43
Barley (winter)	0.42	0.91	1.25	1.06	0.64	0.26	-	-	-	-	-	-
Beans (dry)	-	-	-	-	-	-	0.54	1.09	0.56	-	-	-
Cantaloupes	-	-	-	0.19	0.41	1.10	0.17	-	-	-	-	-
Corn (field)	-	-	-	-	0.15	0.62	1.20	1.08	0.65	-	-	-
Cotton (solid)	-	-	-	-	0.13	0.69	1.31	1.29	1.13	0.65	-	-
Cotton (2 x 1)	-	-	-	-	0.13	0.63	1.17	1.36	1.13	1.01	-	-
Cotton (2 x 2)	-	-	-	-	0.13	0.47	1.13	1.18	1.08	0.55	-	-
Cotton (2 x 2)[b]	-	-	-	-	0.13	0.19	0.87	1.13	0.81	0.35	-	-
Grain sorghum	-	-	-	-	0.13	0.32	1.15	1.05	0.52	-	-	-
Pasture (improved)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Rice	-	-	-	1.04[c]	1.15	1.28	1.28	1.28	1.17	0.40	-	-
Sugar beets (annual)	-	-	-	0.20[d]	0.50	1.00	1.18	1.03	1.04	0.79	0.55	-
Sugar beets (overwintered)	1.00	1.00	1.00	0.49	0.20[d]	0.50	1.00	1.18	1.04	1.07	1.00	1.00
Tomatoes (Machine harvested)	-	-	-	0.29	0.77	1.13	1.06	0.79	-	-	-	-
Trees and Vines												
Deciduous orchard[e]	-	-	0.59	0.71	0.83	0.90	0.96	0.96	0.91	0.80	-	-
Subtropical orchard[f]	-	-	0.59	0.58	0.64	0.64	0.64	0.64	0.58	0.60	-	-
Vineyard (table grapes)	-	-	-	0.16	0.58	0.77	0.85	0.83	0.71	0.40	-	-
Vineyard (wine grapes)[f]	-	-	-	0.16	0.58	0.71	0.64	0.45	0.26	0.07	-	-
Truck Crops												
Potatoes (Spring crop)	-	-	0.66	1.08	1.20	0.64	-	-	-	-	-	-
Tomatoes (hand-picked)	-	-	0.29	0.78	1.13	1.13	0.96	0.64	0.39	-	-	-

a. Relate mainly to Central Valley (California) growing seasons. Modifications may be needed for use in areas or situations with different planting dates.

b. For extremely fine textured (clay) soils.

c. Planted or harvested at mid-month. ET_o for partial month should be used with ratio.

d. Adjusted upward from original values which appeared to be unreasonable.

e. Deciduous trees except almonds (Presumably clean cultivated orchards). Coefficients should likely be 10-25% lower for almonds during the last one-third of the season if cultural practices involve no post-harvest irrigations.

f. No ET data available (in 1974). Original k_p ratios reported were estimated from PET data modified to reflect prevalent irrigation and cultural practices.

ASCE Manuals and Reports on Engineering Practice No. 70

Evapotranspiration and Irrigation Water Requirements

Edited by
M.E. Jensen, R.D. Burman, and R.G. Allen

A manual prepared by the
Committee on Irrigation Water Requirements of the
Irrigation and Drainage Division of the
American Society of Civil Engineers

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TABLE 6.10. Example Mean Crop Coefficients Related to E_o[1] Suggested for Crops Grown in the San Joaquin Valley (adapted from Pruitt et al., 1987a)

Date	Citrus (clean cultivate)	Table grapes	Deciduous orchard (clean cultivate)	Deciduous orchard with cover crop	Beans (dry)	Corn (grain)	Milo	Small grains	Cotton	Sugar beets	Tomato	Onions	Onions	Melons
Jan 1–15	0.83							0.46					0.70	
16–31	0.82							0.67					0.90	
Feb 1–14	0.81							0.95					1.05	
15–28	0.80							1.15					1.10	
Mar 1–15	0.74							1.18				0.32	1.12	
16–31	0.73		0.56	0.96				1.20		0.16		0.34	1.15	0.18
Apr 1–15	0.72		0.62	1.01				1.20		0.22	0.26	0.40	1.15	0.23
16–30	0.72	0.14	0.68	1.06		0.19		1.10	0.17	0.33	0.26	0.55	1.15	0.36
May 1–15	0.72	0.21	0.74	1.10	0.14	0.24		0.81	0.21	0.53	0.31	0.85	1.15	0.72
16–31	0.72	0.50	0.81	1.14	0.40	0.44		0.47	0.29	0.97	0.47	1.06	1.15	1.10
Jun 1–15	0.67	0.64	0.86	1.17	1.10	0.72			0.59	1.14	0.78	1.13	1.14	1.10
16–30	0.67	0.74	0.88	1.19	1.14	1.15	0.14		0.94	1.17	1.10	1.15	1.06	1.10
Jul 1–15	0.67	0.82	0.95	1.21	1.14	1.18	0.21		1.23	1.18	1.19	1.13	0.92	0.96
16–31	0.67	0.85	0.96	1.21	1.01	1.18	0.50		1.25	1.17	1.17	1.04	0.74	0.21
Aug 1–15	0.67	0.85	0.96	1.22	0.52	1.13	1.12		1.25	1.17	1.04	0.91		
16–31	0.67	0.83	0.96	1.21		0.91	1.14		1.22	1.14	0.87	0.74		
Sept 1–15	0.67	0.83	0.96	1.19		0.59	1.10		1.08	1.06				
16–30	0.68	0.78	0.95	1.18			1.00		0.81					
Oct 1–15	0.74	0.67	0.89	1.16			0.80		0.54					
16–31	0.75	0.52	0.84	1.15			0.40							
Nov 1–15	0.76	0.27	0.76	1.11										
16–30	0.77							0.28						
Dec 1–15	0.79							0.34						
16–31	0.80													

[1]Crop coefficients are related to E_{to} defined as cool-season grass E_t. A constant of $K_c = 1.0$ can be assumed for a well-managed pasture with rotation grazing. A $K_c = 0.95$ to 1.0 is recommended as an average between-cutting value for alfalfa for all but winter months.

PROCEDURE

A single spreadsheet was developed for the entire study area using the ETc approach. The spreadsheet is available in PC-Compatible format or Macintosh format. The entire spreadsheet in its original format is included in Appendix D.

STEP 1: Crop Coefficients

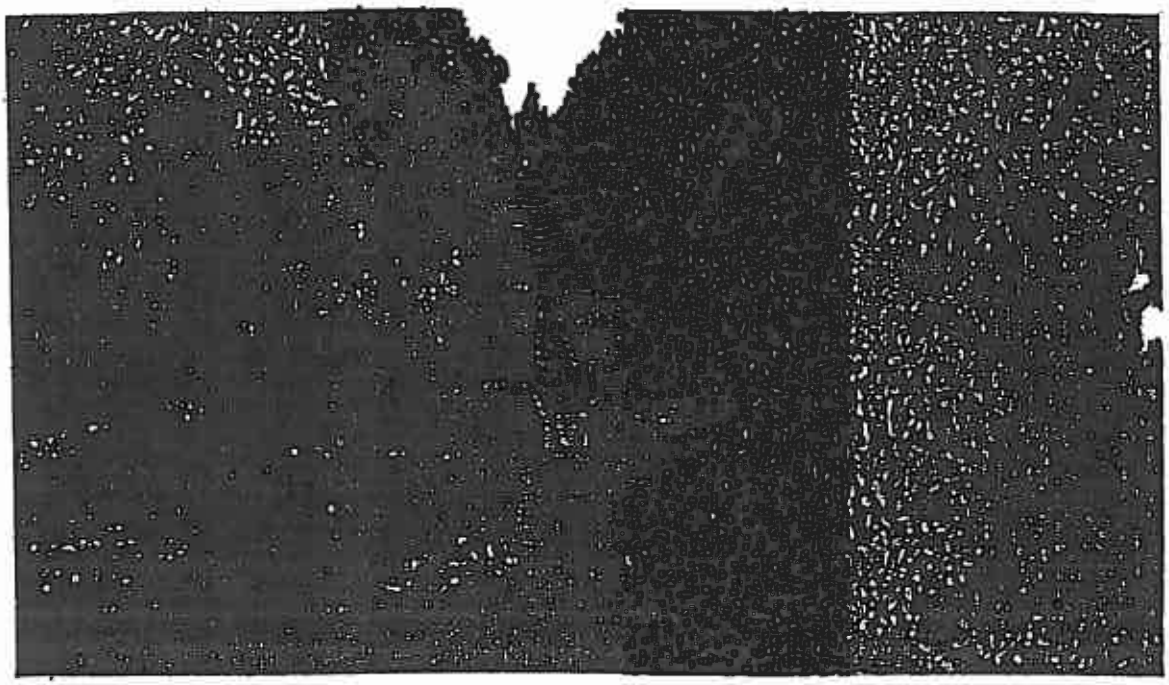
Determination of the crop coefficients.

The crop coefficient is a dimensionless number (usually between 0.0 and 1.2) that is multiplied by the reference evapotranspiration (ETo) value to arrive at a crop evapotranspiration (ETc) estimate. Average crop coefficients were determined from various sources including DWR published values, the University of California Cooperative Extension, locally developed Kc's and Kc's reported from Westlands Water District. The daily values used for each of the crops in this report are included in Appendix B. The following table are the monthly Kc's used in this report.

Table 10
Monthly Crop Kc Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Fallow	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Misc.	0.00	0.00	0.00	0.06	0.30	0.59	1.02	0.92	0.00	0.00	0.00	0.00
Cotton	0.05	0.00	0.00	0.00	0.00	0.00	0.10	0.23	0.70	1.03	1.02	0.56
Alfalfa	0.79	0.57	0.36	0.25	0.32	0.82	0.90	0.90	0.90	0.90	0.90	0.90
Wheat	0.00	0.04	0.23	0.54	0.95	1.17	1.04	0.47	0.00	0.00	0.00	0.00
Melons	0.00	0.00	0.00	0.00	0.00	0.04	0.18	0.43	0.94	0.18	0.00	0.00
Process Tom.	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.40	0.90	1.10	0.85	0.00
Sugar Beets	1.10	1.10	1.10	1.10	1.04	0.44	0.00	0.13	0.38	0.96	1.10	1.10
Barley	0.00	0.03	0.23	0.53	0.93	1.15	0.98	0.30	0.00	0.00	0.00	0.00
Beans	0.00	0.00	0.00	0.00	0.00	0.03	0.14	0.78	1.14	0.56	0.00	0.00
Seed Alf.	0.00	0.03	0.20	0.24	0.47	0.74	0.97	0.97	0.66	0.19	0.00	0.00
Rice	0.00	0.00	0.00	0.00	0.00	0.19	0.95	1.14	1.25	1.17	1.02	0.00
Corn	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.36	0.88	1.10	0.93	0.27
Vegetable	0.00	0.00	0.00	0.06	0.30	0.59	1.02	0.92	0.00	0.00	0.00	0.00
Pasture	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Stonefruit	0.89	0.00	0.00	0.00	0.00	0.50	0.78	0.89	0.98	0.98	0.98	0.97
Walnut/Apple	0.42	0.06	0.00	0.00	0.00	0.54	0.84	0.95	1.06	1.14	1.09	0.77
Sorghum	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.16	0.51	1.04	0.93	0.59

Using Reference Evapotranspiration (ETo) and Crop Coefficients to Estimate Crop Evapotranspiration (ETc) for Trees and Vines



Introduction

Reference evapotranspiration (ETo) information is now available in many agricultural areas of California through the California Irrigation Management Information System (CIMIS). Direct access to real-time (daily) weather and ETo information through a computer dialup service can be obtained by writing:

California Department of Water Resources
Office of Water Conservation
P.O. Box 942836
Sacramento, CA 94236-0001

These daily real-time ETo estimates are used by growers to determine a refined irrigation schedule that can optimize profits relative to the use of water.

Historical average or "normal" ETo values are useful in determining an average or normal irrigation schedule for your crop that will give good results in most years. Daily normal ETo for many locations within California can be determined using the method and average monthly ETo accumulations given in Determining Daily Reference Evapotranspiration, UC Leaflet 21426.

Cooperative Extension University of California
Division of Agriculture and Natural Resources
Leaflet 21428

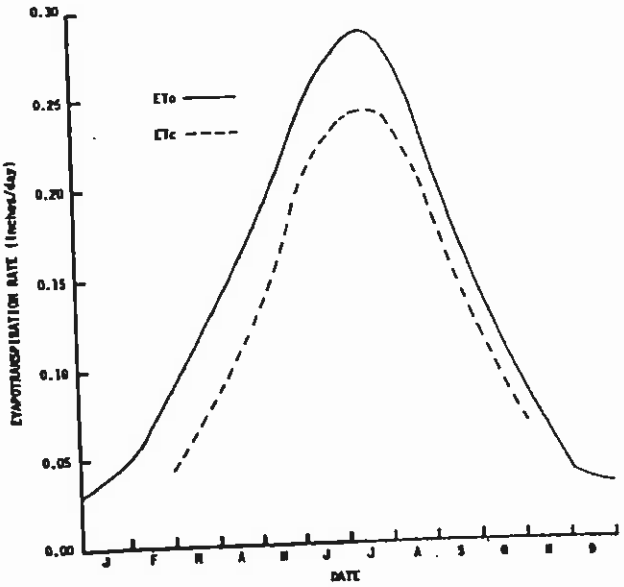


Fig. 1. Normal reference evapotranspiration (ETo) and crop evapotranspiration (ETc) for almonds with no cover crop grown near Bakersfield, California.

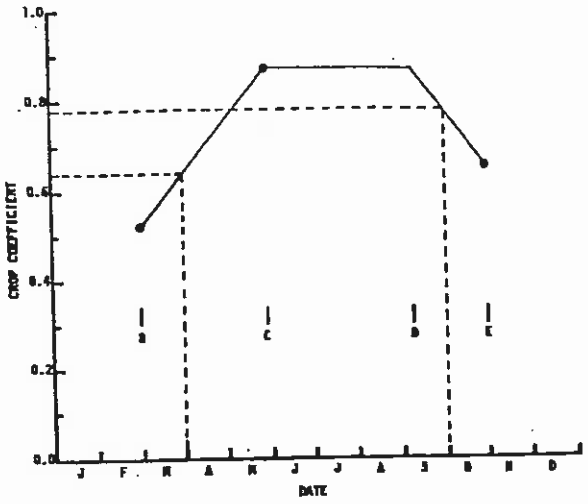


Fig. 2. Crop coefficient (Kc) curve for almonds grown with no cover crop in the San Joaquin Valley with leafout (date B) on March 1, 60 percent ground shading (date C) on May 28, and leafdrop (date E) on October 31.

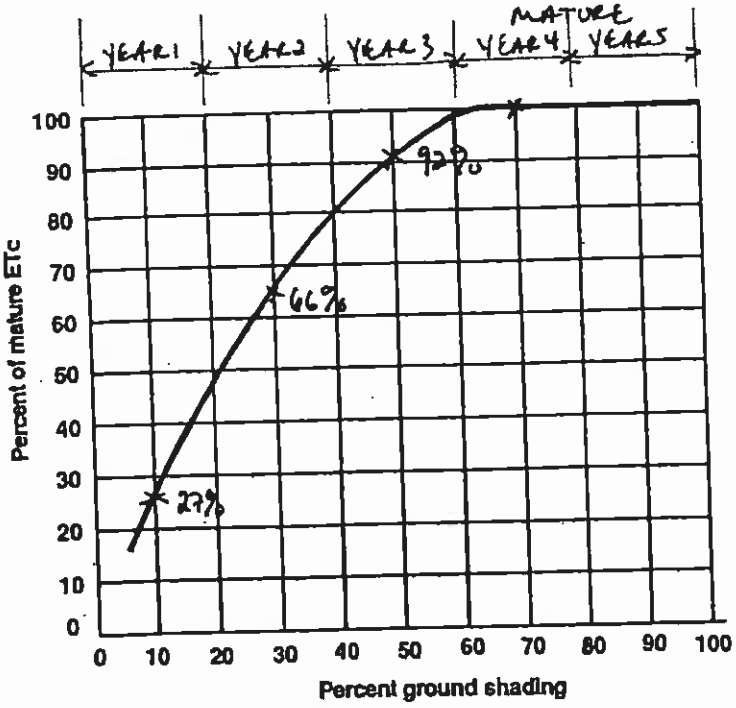


Fig. 3. Relationship between the percent ground area shaded by tree canopy in midsummer and ETc of drip-irrigated young trees as a percent of ETc of mature orchards (estimated from figure 8 in UC Leaflet 21259).

Table 1. Tree and vine coefficients[a] for date B (Kc1), date C (Kc2), and date E (Kc3) with approximate growth dates. Crop coefficients given for deciduous trees are for no cover crop. See the footnotes to correct Kc values for cover crops. Choose the crop coefficients and growth dates corresponding most closely to leafout date (B) for your crop to obtain a first estimate of the Kc values and dates to use for calculating ETc.

Region	Crop	Crop Coefficient			Growth dates			Code[b]
		Kc1	Kc2	Kc3	B	C	E	
Imperial Valley	Citrus	0.56	0.56	0.56	01/01	05/01	12/31	375
	Deciduous orchard	0.55	0.95	0.70	02/28	06/24	10/31	186
	Guayule	0.28	0.72	0.50	01/01	07/24	12/31	166
Central Valley	Deciduous[c] orchard	0.50	0.91	0.48	02/12	05/30	11/03	175
		0.55	0.92	0.52	02/26	06/24	11/10	174
		0.52	0.87	0.65	03/01	05/28	10/31	178
		0.50	0.86	0.75	03/16	06/09	11/15	180
	Deciduous[d] orchard	0.50	1.01	0.53	02/12	05/30	11/03	175
		0.55	1.02	0.57	02/26	06/24	11/10	174
		0.52	0.93	0.88	04/15	06/10	11/10	190
		0.52	0.97	0.85	03/01	05/28	10/31	178
		0.50	0.96	0.80	03/16	06/09	11/15	180
		0.50	0.85	0.80	04/01	06/02	11/30	190
	Grapes	0.35	0.81	0.27	03/12	05/30	09/22	172
		0.25	0.80	0.27	03/26	05/25	10/06	171
		0.27	0.82	0.32	04/30	07/06	11/10	169
		0.06	0.78	0.20	03/01	05/10	09/30	173
		0.07	0.80	0.30	03/16	05/30	10/15	164
		0.07	0.76	0.12	04/16	06/24	11/15	175
	Kiwifruit	0.31	1.05	1.05	04/15	06/01	10/31	175
	Citrus	0.65	0.65	0.65	01/01	05/01	12/31	375
	Olives	0.58	0.80	0.80	03/31	06/19	10/31	175
	Pistachio	0.04	1.12	0.33	03/31	06/04	08/07	161
Statewide	Evergreen shrubbery trees	1.15	1.15	1.15	01/01	05/01	12/31	375
		1.20	1.20	1.20	01/01	05/01	12/31	375

[a]Crop coefficients were estimated from Fereres, et al. (1981), Doorenbos and Pruitt (1977), Letey and Vaux (1984), CDWR (1986), Goldhamer, et al. (1985), Pruitt and Snyder (1984), and Buchner, Shaw and Schulbach (1985).

[b]The first digit of the code identifies the crop type (1 = deciduous; 3 = constant year-round Kc). For deciduous crops, the last two digits are the percentage of the season from leafout (date B) to date D when the Kc begins to decline due to aging. When the crop type is equal to 3, the Kc values do not decline and the last two digits of the code set equal to 99.

[c]Includes peaches, apricots, pears, plums, almonds and pecans without a cover crop. Add 0.30 to Kc1, 0.25 to Kc2, and 0.20 to Kc3 for orchards with an active cover crop.

[d]Includes apples, cherries, and walnuts without a cover crop. Add 0.40 to Kc1, 0.30 to Kc2, and 0.30 to Kc3 for orchards with an active cover crop.

4/99

DS

PIVOT DATE D= 191

B1(SLOPE FROM B TO C) 0.0040
B2(SLOPE FROM D TO E) -0.0041

TAL DAYS	B TO C	CTO D	D TO E	DATE	PIVOT KC	KC	MONTHLY WEIGHTED KC
1	1			1-Mar	0.52	0.5200	
2	2			2-Mar		0.5240	
3	3			3-Mar		0.5280	
4	4			4-Mar		0.5319	
5	5			5-Mar		0.5359	
6	6			6-Mar		0.5399	
7	7			7-Mar		0.5439	
8	8			8-Mar		0.5478	
9	9			9-Mar		0.5518	
10	10			10-Mar		0.5558	
11	11			11-Mar		0.5598	
12	12			12-Mar		0.5638	
13	13			13-Mar		0.5677	
14	14			14-Mar		0.5717	
15	15			15-Mar		0.5757	
16	16			16-Mar		0.5797	
17	17			17-Mar		0.5836	
18	18			18-Mar		0.5876	
19	19			19-Mar		0.5916	
20	20			20-Mar		0.5956	
21	21			21-Mar		0.5995	
22	22			22-Mar		0.6035	
23	23			23-Mar		0.6075	
24	24			24-Mar		0.6115	
25	25			25-Mar		0.6155	
26	26			26-Mar		0.6194	
27	27			27-Mar		0.6234	
28	28			28-Mar		0.6274	
29	29			29-Mar		0.6314	
30	30			30-Mar		0.6353	
31	31			31-Mar		0.6393	0.58
32	32			1-Apr		0.6433	
33	33			2-Apr		0.6473	
34	34			3-Apr		0.6513	
35	35			4-Apr		0.6552	
36	36			5-Apr		0.6592	
37	37			6-Apr		0.6632	
38	38			7-Apr		0.6672	
39	39			8-Apr		0.6711	
40	40			9-Apr		0.6751	
41	41			10-Apr		0.6791	
42	42			11-Apr		0.6831	
43	43			12-Apr		0.6870	
44	44			13-Apr		0.6910	
45	45			14-Apr		0.6950	
46	46			15-Apr		0.6990	
47	47			16-Apr		0.7030	
48	48			17-Apr		0.7069	
49	49			18-Apr		0.7109	
50	50			19-Apr		0.7149	
51	51			20-Apr		0.7189	
52	52			21-Apr		0.7228	
53	53			22-Apr		0.7268	
54	54			23-Apr		0.7308	
55	55			24-Apr		0.7348	
56	56			25-Apr		0.7388	

57	57		26-Apr	0.7427	
58	58		27-Apr	0.7467	
	59		28-Apr	0.7507	
	60		29-Apr	0.7547	
61	61		30-Apr	0.7586	0.70
62	62		1-May	0.7626	
63	63		2-May	0.7666	
64	64		3-May	0.7706	
65	65		4-May	0.7745	
66	66		5-May	0.7785	
67	67		6-May	0.7825	
68	68		7-May	0.7865	
69	69		8-May	0.7905	
70	70		9-May	0.7944	
71	71		10-May	0.7984	
72	72		11-May	0.8024	
73	73		12-May	0.8064	
74	74		13-May	0.8103	
75	75		14-May	0.8143	
76	76		15-May	0.8183	
77	77		16-May	0.8223	
78	78		17-May	0.8263	
79	79		18-May	0.8302	
80	80		19-May	0.8342	
81	81		20-May	0.8382	
82	82		21-May	0.8422	
83	83		22-May	0.8461	
84	84		23-May	0.8501	
85	85		24-May	0.8541	
86	86		25-May	0.8581	
87	87		26-May	0.8620	
88	88		27-May	0.8660	
89	89	1	28-May	0.87	0.8700
90		2	29-May		0.8700
91		3	30-May		0.8700
92		4	31-May		0.8700 0.82
93		5	1-Jun		0.8700
94		6	2-Jun		0.8700
95		7	3-Jun		0.8700
96		8	4-Jun		0.8700
97		9	5-Jun		0.8700
98		10	6-Jun		0.8700
99		11	7-Jun		0.8700
100		12	8-Jun		0.8700
101		13	9-Jun		0.8700
102		14	10-Jun		0.8700
103		15	11-Jun		0.8700
104		16	12-Jun		0.8700
105		17	13-Jun		0.8700
106		18	14-Jun		0.8700
107		19	15-Jun		0.8700
108		20	16-Jun		0.8700
109		21	17-Jun		0.8700
110		22	18-Jun		0.8700
111		23	19-Jun		0.8700
112		24	20-Jun		0.8700
113		25	21-Jun		0.8700
114		26	22-Jun		0.8700
115		27	23-Jun		0.8700
116		28	24-Jun		0.8700
117		29	25-Jun		0.8700
118		30	26-Jun		0.8700
119		31	27-Jun		0.8700

120	32	28-Jun	0.8700	
121	33	29-Jun	0.8700	
122	34	30-Jun	0.8700	0.87
123	35	1-Jul	0.8700	
124	36	2-Jul	0.8700	
125	37	3-Jul	0.8700	
126	38	4-Jul	0.8700	
127	39	5-Jul	0.8700	
128	40	6-Jul	0.8700	
129	41	7-Jul	0.8700	
130	42	8-Jul	0.8700	
131	43	9-Jul	0.8700	
132	44	10-Jul	0.8700	
133	45	11-Jul	0.8700	
134	46	12-Jul	0.8700	
135	47	13-Jul	0.8700	
136	48	14-Jul	0.8700	
137	49	15-Jul	0.8700	
138	50	16-Jul	0.8700	
139	51	17-Jul	0.8700	
140	52	18-Jul	0.8700	
141	53	19-Jul	0.8700	
142	54	20-Jul	0.8700	
143	55	21-Jul	0.8700	
144	56	22-Jul	0.8700	
145	57	23-Jul	0.8700	
146	58	24-Jul	0.8700	
147	59	25-Jul	0.8700	
148	60	26-Jul	0.8700	
149	61	27-Jul	0.8700	
150	62	28-Jul	0.8700	
151	63	29-Jul	0.8700	
152	64	30-Jul	0.8700	
153	65	31-Jul	0.8700	0.87
154	66	1-Aug	0.8700	
155	67	2-Aug	0.8700	
156	68	3-Aug	0.8700	
157	69	4-Aug	0.8700	
158	70	5-Aug	0.8700	
159	71	6-Aug	0.8700	
160	72	7-Aug	0.8700	
161	73	8-Aug	0.8700	
162	74	9-Aug	0.8700	
163	75	10-Aug	0.8700	
164	76	11-Aug	0.8700	
165	77	12-Aug	0.8700	
166	78	13-Aug	0.8700	
167	79	14-Aug	0.8700	
168	80	15-Aug	0.8700	
169	81	16-Aug	0.8700	
170	82	17-Aug	0.8700	
171	83	18-Aug	0.8700	
172	84	19-Aug	0.8700	
173	85	20-Aug	0.8700	
174	86	21-Aug	0.8700	
175	87	22-Aug	0.8700	
176	88	23-Aug	0.8700	
177	89	24-Aug	0.8700	
178	90	25-Aug	0.8700	
179	91	26-Aug	0.8700	
180	92	27-Aug	0.8700	
181	93	28-Aug	0.8700	
182	94	29-Aug	0.8700	

183	95		30-Aug		0.8700	
184	96		31-Aug		0.8700	0.87
185	97		1-Sep		0.8700	
186	98		2-Sep		0.8700	
187	99		3-Sep		0.8700	
188	100		4-Sep		0.8700	
189	101		5-Sep		0.8700	
190	102		6-Sep		0.8700	
191	103	1	7-Sep	0.87	0.8700	
192		2	8-Sep		0.8659	
193		3	9-Sep		0.8619	
194		4	10-Sep		0.8578	
195		5	11-Sep		0.8537	
196		6	12-Sep		0.8496	
197		7	13-Sep		0.8456	
198		8	14-Sep		0.8415	
199		9	15-Sep		0.8374	
200		10	16-Sep		0.8333	
201		11	17-Sep		0.8293	
202		12	18-Sep		0.8252	
203		13	19-Sep		0.8211	
204		14	20-Sep		0.8170	
205		15	21-Sep		0.8130	
206		16	22-Sep		0.8089	
207		17	23-Sep		0.8048	
208		18	24-Sep		0.8007	
209		19	25-Sep		0.7967	
210		20	26-Sep		0.7926	
211		21	27-Sep		0.7885	
212		22	28-Sep		0.7844	
213		23	29-Sep		0.7804	
214		24	30-Sep		0.7763	0.83
215		25	1-Oct		0.7722	
216		26	2-Oct		0.7681	
217		27	3-Oct		0.7641	
218		28	4-Oct		0.7600	
219		29	5-Oct		0.7559	
220		30	6-Oct		0.7519	
221		31	7-Oct		0.7478	
222		32	8-Oct		0.7437	
223		33	9-Oct		0.7396	
224		34	10-Oct		0.7356	
225		35	11-Oct		0.7315	
226		36	12-Oct		0.7274	
227		37	13-Oct		0.7233	
228		38	14-Oct		0.7193	
229		39	15-Oct		0.7152	
230		40	16-Oct		0.7111	
231		41	17-Oct		0.7070	
232		42	18-Oct		0.7030	
233		43	19-Oct		0.6989	
234		44	20-Oct		0.6948	
235		45	21-Oct		0.6907	
236		46	22-Oct		0.6867	
237		47	23-Oct		0.6826	
238		48	24-Oct		0.6785	
239		49	25-Oct		0.6744	
240		50	26-Oct		0.6704	
241		51	27-Oct		0.6663	
242		52	28-Oct		0.6622	
243		53	29-Oct		0.6581	
244		54	30-Oct		0.6541	
245		55	31-Oct	0.65	0.6500	0.71

MONTHLY CROP EVAPOTRANSIRATION DATA

9/23/99

San Luis Water District
Crop Consumptive Use - Alfalfa (FDR #1)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.91	3.57	3.24	4.24	3.85
November	0.79	1.50	1.19	1.52	1.20
December	0.68	0.99	0.67	0.86	0.58
January	0.63	1.57	0.99	0.66	0.42
February	0.66	2.02	1.33	1.21	0.80
March	0.87	4.08	3.55	2.86	2.49
April	0.91	5.65	5.14	4.75	4.32
May	0.91	7.76	7.06	5.64	5.13
June	0.92	8.65	7.95	7.32	6.73
July	0.94	9.16	8.61	8.52	8.01
August	0.97	7.77	7.54	7.81	7.58
September	0.97	5.26	5.10	5.29	5.13
October	0.91	3.92	3.57	3.63	3.30
November	0.79	2.10	1.66	1.55	1.22
December	0.68	1.05	0.71	1.14	0.78
January	0.63	1.24	0.78	0.74	0.46
February	0.66	2.11	1.39	1.57	1.04
Crop Year Total		57.95	52.36	50.68	46.23
Water Year Total		58.72	53.05	50.80	46.18
Calendar Year Total		58.96	53.20	50.36	45.89

9/23/99

San Luis Water District
Crop Consumptive Use - Almonds (FDR #2)

Month	Kc				1989 ETo (in)	1989 ETc (in)				1988 ETo (in)	1988 ETc (in)			
	Year 1	Year 2	Year 3	Mature		Year 1	Year 2	Year 3	Mature		Year 1	Year 2	Year 3	Mature
October	0.19	0.47	0.65	0.71	3.57	0.68	1.67	2.33	2 53	4.24	0.81	1.98	2.77	3.01
November	0.00	0.00	0 00	0.00	1.50	0.00	0.00	0.00	0.00	1.52	0.00	0.00	0.00	0.00
December	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.86	0.00	0.00	0.00	0.00
January	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00		0.66	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	2.02	0.00	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.00
March	0.16	0.38	0.53	0.58	4.08	0.64	1.56	2.18	2.37	2.86	0.45	1.09	1.53	1.66
April	0.19	0.46	0.64	0.70	5.65	1.07	2.61	3.64	3.95	4.75	0.90	2.19	3.06	3.33
May	0.22	0.54	0.75	0.82	7.76	1.72	4.20	5.85	6.36	5.64	1.25	3.05	4.25	4.62
June	0.23	0.57	0.80	0.87	8.65	2.03	4.96	6.92	7.52	7.32	1.72	4.20	5.85	6.36
July	0.23	0.57	0.80	0.87	9.16	2.15	5.26	7.33	7.96	8.52	2.00	4.89	6.82	7.41
August	0.23	0.57	0.80	0.87	7.77	1.83	4 46	6.22	6 76	7.81	1.83	4.48	6.25	6.79
September	0 22	0.55	0.76	0.83	5.26	1.16	2.88	4 02	4 37	5.29	1.19	2.90	4.04	4 39
October	0.19	0.47	0.65	0.71	3.92	0.75	1.84	2.56	2.78	3.63	0.69	1.70	2.37	2.57
November	0.00	0.00	0.00	0.00	2 10	0 00	0.00	0.00	0 00	1.55	0 00	0 00	0.00	0.00
December	0.00	0.00	0.00	0.00	1 05	0.00	0.00	0.00	0 00	1.14	0.00	0.00	0.00	0.00
January	0.00	0.00	0 00	0 00	1.24	0.00	0.00	0 00	0.00	0.74	0.00	0.00	0.00	0.00
February	0 00	0.00	0.00	0.00	2 11	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00
Crop Year Total					57.95	11.29	27.60	38.48	41.82	50.66	10.14	24.80	34.57	37.57
Water Year Total					58.72	11.38	27.77	38.71	42 08	50.80	10 03	24.51	34.17	37.14
Calendar Year Total					58.96	11.36	27.77	38.71	42.08	50.36	10.03	24.51	34.17	37.14

9/23/99

San Luis Water District
Crop Consumptive Use - Barley (FDR #3)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.07	1.50	0.11	1.52	0.11
December	0.21	0.99	0.21	0.86	0.18
January	0.68	1.57	1.06	0.66	0.45
February	1.10	2.02	2.22	1.21	1.33
March	1.17	4.08	4.77	2.86	3.35
April	0.86	5.65	4.85	4.75	4.09
May	0.45	7.76	3.49	5.64	2.54
June	0.13	8.65	1.12	7.32	0.95
July	0.00	9.16	0.00	8.52	0.00
August	0.00	7.77	0.00	7.81	0.00
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.07	2.10	0.15	1.55	0.11
December	0.21	1.05	0.22	1.14	0.24
January	0.68	1.24	0.84	0.74	0.50
February	1.10	2.11	2.32	1.57	1.73
Crop Year Total		57.95	17.84	50.66	12.98
Water Year Total		58.72	17.77	50.80	13.49
Calendar Year Total		58.96	17.89	50.36	13.05

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San Luis Water District
Crop Consumptive Use - Beans (dry) (FDR #4)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.02	4.08	0.08	2.86	0.06
April	0.07	5.65	0.40	4.75	0.33
May	0.53	7.76	4.11	5.64	2.99
June	1.13	8.65	9.77	7.32	8.27
July	0.83	9.16	7.60	8.52	7.07
August	0.13	7.77	1.01	7.81	1.02
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	22.97	50.66	19.73
Water Year Total		58.72	22.97	50.80	19.73
Calendar Year Total		58.96	22.97	50.36	19.73

9/23/99

San Luis Water District
Crop Consumptive Use - Corn (field) (FDR #5)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.00	4.08	0.00	2.86	0.00
April	0.11	5.65	0.62	4.75	0.52
May	0.35	7.76	2.72	5.64	1.97
June	0.91	8.65	7.87	7.32	6.66
July	1.14	9.16	10.44	8.52	9.71
August	0.98	7.77	7.61	7.81	7.65
September	0.29	5.26	1.53	5.29	1.53
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	30.78	50.66	28.05
Water Year Total		58.72	30.78	50.80	28.05
Calendar Year Total		58.96	30.78	50.36	28.05

9/23/99

San Luis Water District
Crop Consumptive Use - Cotton (FDR #6)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.16	3.57	0.57	4.24	0.68
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.00	4.08	0.00	2.86	0.00
April	0.10	5.65	0.56	4.75	0.48
May	0.37	7.76	2.87	5.64	2.08
June	0.74	8.65	6.40	7.32	5.41
July	1.14	9.16	10.44	8.52	9.71
August	1.13	7.77	8.78	7.81	8.83
September	0.75	5.26	3.95	5.29	3.97
October	0.16	3.92	0.63	3.63	0.58
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	33.57	50.66	31.16
Water Year Total		58.72	33.62	50.60	31.06
Calendar Year Total		58.96	33.62	50.36	31.06

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San Luis Water District
Crop Consumptive Use - Deciduous Orchard (FDR #7)

Month	Kc				1989 ETo (in)	1989 ETc (in)				1998 ETo (in)	1998 ETc (in)			
	Year 1	Year 2	Year 3	Mature		Year 1	Year 2	Year 3	Mature		Year 1	Year 2	Year 3	Mature
October	0.23	0.57	0.80	0.87	3.57	0.84	2.05	2.85	3.10	4.24	0.99	2.43	3.39	3.68
November	0.10	0.25	0.35	0.38	1.50	0.15	0.38	0.52	0.57	1.52	0.16	0.38	0.53	0.58
December	0.00	0.00	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.86	0.00	0.00	0.00	0.00
January	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	2.02	0.00	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.00
March	0.08	0.18	0.26	0.28	4.08	0.31	0.75	1.05	1.14	2.86	0.22	0.53	0.74	0.80
April	0.18	0.43	0.60	0.65	5.65	0.99	2.42	3.38	3.67	4.75	0.83	2.04	2.84	3.09
May	0.21	0.51	0.72	0.78	7.76	1.63	3.99	5.57	6.05	5.64	1.19	2.90	4.04	4.40
June	0.23	0.57	0.80	0.87	8.65	2.03	4.96	6.92	7.52	7.32	1.72	4.20	5.85	6.36
July	0.28	0.63	0.88	0.96	9.16	2.37	5.80	8.09	8.79	8.52	2.21	5.40	7.52	8.18
August	0.26	0.63	0.88	0.96	7.77	2.01	4.92	6.86	7.46	7 81	2.02	4.95	6.90	7.50
September	0.26	0.63	0.88	0.96	5.26	1.36	3.33	4.65	5.05	5.29	1.37	3.35	4.67	5.08
October	0.23	0.57	0.80	0.87	3.92	0.92	2.25	3.14	3.41	3.63	0.85	2.08	2.90	3.15
November	0.10	0.25	0.35	0.38	2.10	0.21	0.53	0.73	0.80	1.55	0.16	0.39	0 54	0.59
December	0.00	0.00	0.00	0.00	1.05	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0 00
January	0.00	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0 00	0.00
February	0.00	0.00	0.00	0.00	2.11	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00
Crop Year Total					57.95	11.71	28.61	39.89	43.35	50.66	10.71	26.18	36.49	39.66
Water Year Total					58.72	11.85	28.97	40.38	43.89	50.80	10.57	25.83	36.01	39.14
Calendar Year Total					58.96	11.85	28.97	40.38	43.89	50.38	10.57	25 83	36.01	39.14

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San Luis Water District
Crop Consumptive Use - Grain Sorghum (Milo) (FDR #8)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.60	3.57	2.14	4.24	2.54
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.00	4.08	0.00	2.86	0.00
April	0.00	5.65	0.00	4.75	0.00
May	0.00	7.76	0.00	5.64	0.00
June	0.07	8.65	0.61	7.32	0.51
July	0.36	9.16	3.30	8.52	3.07
August	1.13	7.77	8.78	7.81	8.83
September	1.05	5.26	5.52	5.29	5.55
October	0.60	3.92	2.35	3.63	2.18
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	20.34	50.66	20.50
Water Year Total		58.72	20.56	50.80	20.13
Calendar Year Total		58.96	20.56	50.36	20.13

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San Luis Water District
Crop Consumptive Use - Grains (FDR #9)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.31	0.99	0.31	0.86	0.27
January	0.57	1.57	0.89	0.66	0.38
February	1.05	2.02	2.12	1.21	1.27
March	1.19	4.08	4.86	2.86	3.40
April	1.15	5.65	6.49	4.75	5.46
May	0.64	7.76	4.97	5.64	3.61
June	0.00	8.65	0.00	7.32	0.00
July	0.00	9.16	0.00	8.52	0.00
August	0.00	7.77	0.00	7.81	0.00
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.31	1.05	0.32	1.14	0.35
January	0.57	1.24	0.70	0.74	0.42
February	1.05	2.11	2.22	1.57	1.65
Crop Year Total		57.95	19.63	50.66	14.39
Water Year Total		58.72	19.56	50.80	14.89
Calendar Year Total		58.96	19.65	50.36	14.47

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San Luis Water District
Crop Consumptive Use - Melons (FDR#10)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.07	4.08	0.29	2.86	0.20
April	0.24	5.65	1.35	4.75	1.14
May	0.67	7.76	5.20	5.64	3.78
June	1.02	8.65	8.82	7.32	7.46
July	0.39	9.16	3.57	8.52	3.32
August	0.00	7.77	0.00	7.81	0.00
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	19.23	50.66	15.90
Water Year Total		58.72	19.23	50.80	15.90
Calendar Year Total		58.96	19.23	50.36	15.90

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San Luis Water District
Crop Consumptive Use - Misc. Truck/Field Crops (High) (FDR#11)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.66	3.57	2.35	4.24	2.80
November	0.30	1.50	0.45	1.52	0.45
December	0.35	0.99	0.35	0.86	0.30
January	0.40	1.57	0.63	0.66	0.26
February	0.47	2.02	0.95	1.21	0.57
March	0.74	4.08	3.02	2.86	2.12
April	0.97	5.65	5.48	4.75	4.61
May	0.97	7.76	7.53	5.64	5.47
June	0.66	8.65	5.71	7.32	4.83
July	0.19	9.16	1.74	8.52	1.62
August	0.66	7.77	5.13	7.81	5.15
September	0.87	5.26	4.58	5.29	4.60
October	0.66	3.92	2.59	3.63	2.39
November	0.30	2.10	0.63	1.55	0.46
December	0.35	1.05	0.37	1.14	0.40
January	0.40	1.24	0.49	0.74	0.29
February	0.47	2.11	0.99	1.57	0.74
Crop Year Total		57.95	37.89	50.66	32.78
Water Year Total		58.72	38.24	50.80	32.68
Calendar Year Total		58.96	38.33	50.36	32.48

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San Luis Water District
Crop Consumptive Use - Misc. Truck/Field Crops (Low) (FDR#12)

Month	Kc	1989 ETo (In)	1989 ETc (In)	1998 ETo (In)	1998 ETc (In)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.06	1.57	0.09	0.66	0.04
February	0.30	2.02	0.60	1.21	0.36
March	0.59	4.08	2.41	2.86	1.69
April	1.02	5.65	5.76	4.75	4.85
May	0.92	7.76	7.14	5.64	5.18
June	0.00	8.65	0.00	7.32	0.00
July	0.00	9.16	0.00	8.52	0.00
August	0.00	7.77	0.00	7.81	0.00
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.06	1.24	0.07	0.74	0.04
February	0.30	2.11	0.63	1.57	0.47
Crop Year Total		57.95	16.00	50.66	12.12
Water Year Total		58.72	16.01	50.80	12.23
Calendar Year Total		58.96	16.00	50.36	12.12

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San Luis Water District
Crop Consumptive Use - Misc. Truck/Field Crops (Med) (FDR#13)

Month	Kc	1989 ETo (In)	1989 ETc (In)	1998 ETo (In)	1998 ETc (In)
October	0.33	3.57	1.18	4.24	1.40
November	0.15	1.50	0.23	1.52	0.23
December	0.18	0.99	0.17	0.86	0.15
January	0.23	1.57	0.36	0.66	0.15
February	0.39	2.02	0.78	1.21	0.47
March	0.67	4.08	2.71	2.86	1.90
April	1.00	5.65	5.62	4.75	4.73
May	0.95	7.76	7.33	5.64	5.33
June	0.33	8.65	2.85	7.32	2.41
July	0.10	9.16	0.87	8.52	0.81
August	0.33	7.77	2.56	7.81	2.58
September	0.44	5.26	2.29	5.29	2.30
October	0.33	3.92	1.29	3.63	1.20
November	0.15	2.10	0.31	1.55	0.23
December	0.18	1.05	0.18	1.14	0.20
January	0.23	1.24	0.28	0.74	0.17
February	0.39	2.11	0.81	1.57	0.60
Crop Year Total		57.95	26.95	50.66	22.45
Water Year Total		58.72	27.13	50.80	22.46
Calendar Year Total		58.96	27.16	50.36	22.30

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San Luis Water District
Crop Consumptive Use - Nursery/Lettuce (FDR#14)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.03	1.57	0.05	0.66	0.02
February	0.15	2.02	0.30	1.21	0.18
March	0.30	4.08	1.20	2.86	0.84
April	0.51	5.65	2.88	4.75	2.42
May	0.46	7.76	3.57	5.64	2.59
June	0.00	8.65	0.00	7.32	0.00
July	0.00	9.16	0.00	8.52	0.00
August	0.00	7.77	0.00	7.81	0.00
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.03	1.24	0.04	0.74	0.02
February	0.15	2.11	0.32	1.57	0.24
Crop Year Total		57.95	8.00	50.66	6.06
Water Year Total		58.72	8.01	50.80	6.12
Calendar Year Total		58.96	8.00	50.36	6.06

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San Luis Water District
Crop Consumptive Use - Pasture (Improved) (FDR #15)

Month	Kc	1989 ETo (In)	1989 ETc (In)	1998 ETo (In)	1998 ETc (In)
October	0.90	3.57	3.21	4.24	3.81
November	0.90	1.50	1.35	1.52	1.36
December	0.90	0.99	0.89	0.86	0.77
January	0.90	1.57	1.41	0.66	0.59
February	0.90	2.02	1.81	1.21	1.09
March	0.90	4.08	3.67	2.86	2.57
April	0.90	5.65	5.08	4.75	4.28
May	0.90	7.76	6.98	5.64	5.07
June	0.90	8.65	7.78	7.32	6.58
July	0.90	9.16	8.24	8.52	7.67
August	0.90	7.77	6.99	7.81	7.03
September	0.90	5.26	4.73	5.29	4.76
October	0.90	3.92	3.53	3.63	3.26
November	0.90	2.10	1.89	1.55	1.39
December	0.90	1.05	0.94	1.14	1.03
January	0.90	1.24	1.11	0.74	0.66
February	0.90	2.11	1.90	1.57	1.41
Crop Year Total		57.95	52.16	50.66	45.59
Water Year Total		58.72	52.85	50.80	45.72
Calendar Year Total		58.96	53.06	50.36	45.32

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San Luis Water District
Crop Consumptive Use - Potatoes (FDR #16)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.66	4.08	2.69	2.86	1.89
April	1.08	5.65	6.10	4.75	5.13
May	1.20	7.76	9.31	5.64	6.76
June	0.64	8.65	5.53	7.32	4.68
July	0.00	9.16	0.00	8.52	0.00
August	0.00	7.77	0.00	7.81	0.00
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	23.63	50.66	18.46
Water Year Total		58.72	23.63	50.80	18.46
Calendar Year Total		58.96	23.63	50.36	18.46

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San Luis Water District
Crop Consumptive Use - Rice (FDR #17)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.20	3.57	0.71	4.24	0.85
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.10	4.08	0.41	2.86	0.29
April	1.00	5.65	5.65	4.75	4.75
May	1.15	7.76	8.92	5.64	6.48
June	1.27	8.65	10.98	7.32	9.29
July	1.23	9.16	11.26	8.52	10.48
August	1.15	7.77	8.94	7.81	8.98
September	0.59	5.26	3.10	5.29	3.12
October	0.20	3.92	0.78	3.63	0.73
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	49.97	50.66	44.24
Water Year Total		58.72	50.04	50.80	44.11
Calendar Year Total		58.96	50.04	50.36	44.11

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San Luis Water District
Crop Consumptive Use - Subtropical Orchard (FDR #18)

Month	Kc				1969					1998				
					ETo	ETc (in)				ETo	ETc (in)			
	Year 1	Year 2	Year 3	Mature	(in)	Year 1	Year 2	Year 3	Mature	(in)	Year 1	Year 2	Year 3	Mature
October	0.20	0.50	0.69	0.75	3.57	0.72	1.76	2.46	2.67	4.24	0.86	2.10	2.92	3.18
November	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	1.52	0.00	0.00	0.00	0.00
December	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.86	0.00	0.00	0.00	0.00
January	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	2.02	0.00	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.00
March	0.15	0.36	0.51	0.55	4.08	0.61	1.48	2.08	2.24	2.86	0.42	1.04	1.45	1.57
April	0.18	0.45	0.63	0.68	5.65	1.04	2.53	3.53	3.84	4.75	0.87	2.13	2.97	3.23
May	0.21	0.51	0.71	0.77	7.76	1.61	3.94	5.50	5.98	5.64	1.17	2.86	3.99	4.34
June	0.22	0.53	0.75	0.81	8.65	1.89	4.62	6.44	7.00	7.32	1.60	3.91	5.45	5.93
July	0.22	0.53	0.75	0.81	9.16	2.00	4.89	6.82	7.42	6.52	1.86	4.55	6.35	6.90
August	0.22	0.53	0.75	0.81	7.77	1.70	4.15	5.79	6.29	7.81	1.71	4.18	5.82	6.33
September	0.16	0.38	0.53	0.58	5.26	0.82	2.01	2.81	3.05	5.29	0.83	2.03	2.82	3.07
October	0.20	0.50	0.69	0.75	3.82	0.79	1.94	2.70	2.94	3.63	0.73	1.79	2.50	2.72
November	0.00	0.00	0.00	0.00	2.10	0.00	0.00	0.00	0.00	1.55	0.00	0.00	0.00	0.00
December	0.00	0.00	0.00	0.00	1.05	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00
January	0.00	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	2.11	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00
Crop Year Total					57.95	10.39	25.41	35.41	38.49	50.66	9.33	22.80	31.78	34.54
Water Year Total					58.72	10.47	25.58	35.66	38.76	50.80	9.20	22.49	31.35	34.08
Calendar Year Total					58.96	10.47	25.58	35.66	38.76	50.36	9.20	22.49	31.35	34.08

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San Luis Water District
Crop Consumptive Use - Sugar Beets (FDR #19)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.08	4.08	0.33	2.86	0.23
April	0.28	5.65	1.58	4.75	1.33
May	0.75	7.76	5.82	5.64	4.23
June	1.16	8.65	10.03	7.32	8.49
July	1.18	9.16	10.80	8.52	10.05
August	1.16	7.77	9.01	7.81	9.06
September	0.53	5.26	2.79	5.29	2.80
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	40.36	50.66	36.19
Water Year Total		58.72	40.36	50.80	36.19
Calendar Year Total		58.96	40.36	50.36	36.19

9/23/99

San Luis Water District
Crop Consumptive Use - Tomatoes (FDR #20)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.00	1.50	0.00	1.52	0.00
December	0.00	0.99	0.00	0.86	0.00
January	0.00	1.57	0.00	0.66	0.00
February	0.00	2.02	0.00	1.21	0.00
March	0.00	4.08	0.00	2.86	0.00
April	0.26	5.65	1.47	4.75	1.24
May	0.42	7.76	3.26	5.64	2.37
June	0.94	8.65	8.13	7.32	6.88
July	1.18	9.16	10.80	8.52	10.05
August	0.96	7.77	7.46	7.81	7.50
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.00	2.10	0.00	1.55	0.00
December	0.00	1.05	0.00	1.14	0.00
January	0.00	1.24	0.00	0.74	0.00
February	0.00	2.11	0.00	1.57	0.00
Crop Year Total		57.95	31.12	50.66	28.03
Water Year Total		58.72	31.12	50.80	28.03
Calendar Year Total		58.96	31.12	50.36	28.03

9/24/99

San Luis Water District
Crop Consumptive Use - Vineyard (FDR# 21)

Month	Kc				1989					1998				
					ETo	ETc (in)				ETo	ETc (in)			
	Year 1	Year 2	Year 3	Mature	(in)	Year 1	Year 2	Year 3	Mature [1]	(in)	Year 1	Year 2	Year 3	Mature
October	0.16	0.40	0.55	0.60	3.57	0.58	1.41	1.97	2.14	4.24	0.69	1.68	2.34	2.54
November	0.04	0.09	0.13	0.14	1.50	0.06	0.14	0.19	0.21	1.52	0.06	0.14	0.20	0.21
December	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
January	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	2.02	0.00	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.00
March	0.00	0.00	0.00	0.00	4.08	0.00	0.00	0.00	0.00	2.86	0.00	0.00	0.00	0.00
April	0.02	0.05	0.06	0.07	5.65	0.11	0.28	0.36	0.40	4.75	0.09	0.22	0.31	0.33
May	0.10	0.24	0.33	0.36	7.76	0.75	1.84	2.57	2.79	5.64	0.55	1.34	1.87	2.03
June	0.19	0.46	0.63	0.69	8.65	1.61	3.94	5.49	5.97	7.32	1.36	3.33	4.64	5.05
July	0.23	0.55	0.77	0.84	9.16	2.08	5.08	7.07	7.69	8.52	1.93	4.72	6.58	7.16
August	0.23	0.55	0.77	0.84	7.77	1.76	4.31	6.00	6.53	7.81	1.77	4.33	6.04	6.58
September	0.22	0.53	0.75	0.81	5.26	1.15	2.81	3.92	4.26	5.29	1.16	2.83	3.94	4.28
October	0.16	0.40	0.55	0.60	3.92	0.84	1.55	2.16	2.35	3.63	0.59	1.44	2.00	2.18
November	0.04	0.09	0.13	0.14	2.10	0.08	0.19	0.27	0.29	1.55	0.06	0.14	0.20	0.22
December	0.00	0.00	0.00	0.00	1.05	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00
January	0.00	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	2.11	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00
Crop Year Total					57.95	8.09	19.79	27.58	29.98	50.66	7.60	18.59	25.91	28.16
Water Year Total					58.72	8.17	19.98	27.85	30.28	50.80	7.51	18.35	25.58	27.80
Calendar Year Total					58.96	8.17	19.98	27.85	30.28	50.36	7.51	18.35	25.58	27.80

9/23/99

San Luis Water District
Crop Consumptive Use - Wheat (FDR# 22)

Month	Kc	1989 ETo (in)	1989 ETc (in)	1998 ETo (in)	1998 ETc (in)
October	0.00	3.57	0.00	4.24	0.00
November	0.04	1.50	0.06	1.52	0.06
December	0.23	0.99	0.23	0.86	0.20
January	0.54	1.57	0.85	0.66	0.36
February	0.95	2.02	1.91	1.21	1.15
March	1.17	4.08	4.77	2.86	3.35
April	1.04	5.65	5.87	4.75	4.94
May	0.47	7.76	3.65	5.64	2.65
June	0.00	8.65	0.00	7.32	0.00
July	0.00	9.16	0.00	8.52	0.00
August	0.00	7.77	0.00	7.81	0.00
September	0.00	5.26	0.00	5.29	0.00
October	0.00	3.92	0.00	3.63	0.00
November	0.04	2.10	0.08	1.55	0.06
December	0.23	1.05	0.24	1.14	0.26
January	0.54	1.24	0.67	0.74	0.40
February	0.95	2.11	2.00	1.57	1.49
Crop Year Total		57.95	17.34	50.66	12.70
Water Year Total		58.72	17.29	50.80	13.15
Calendar Year Total		58.96	17.38	50.36	12.76

YEARLY CROP EVAPOTRANSPIRATION DATA

9/23/99 **SAN LUIS WATER DISTRICT**
1989 - CROP CONSUMPTIVE USE, ETc (IN)

FDR #	CROP	CROP YEAR	WATER YEAR	CALENDAR YEAR
1	ALFALFA	52.36	53.05	53.20
2	ALMONDS			
	YEAR 1	11.29	11.36	11.36
	YEAR 2	27.60	27.77	27.77
	YEAR 3	38.48	38.71	38.71
	MATURE	41.82	42.08	42.08
3	BARLEY	17.84	17.77	17.89
4	BEANS(DRY)	22.97	22.97	22.97
5	CORN(FIELD)	30.78	30.78	30.78
6	COTTON	33.57	33.62	33.62
7	DECIDUOUS ORCHARDS			
	YEAR 1	11.71	11.85	11.85
	YEAR 2	28.61	28.97	28.97
	YEAR 3	39.89	40.38	40.38
	MATURE	43.35	43.89	43.89
8	GRAIN SORGHUM(MILO)	20.34	20.56	20.56
9	GRAINS	19.63	19.56	19.65
10	MELONS	19.23	19.23	19.23
11	MISC. TRUCK FIELD CROPS(HIGH)	37.89	38.24	38.33
12	MISC. TRUCK FIELD CROPS(LOW)	16.00	16.01	16.00
13	MISC. TRUCK FIELD CROPS(MED)	26.95	27.13	27.16
14	NURSERY/LETTUCE	8.00	8.01	8.00
15	PASTURE(IMPROVED)	52.16	52.85	53.06
16	POTATOES	23.63	23.63	23.63
17	RICE	49.97	50.04	50.04
18	SUBTROPICAL ORCHARDS			
	YEAR 1	10.39	10.47	10.47
	YEAR 2	25.41	25.58	25.58
	YEAR 3	35.41	35.66	35.66
	MATURE	38.49	38.76	38.76
19	SUGAR BEETS	40.36	40.36	40.36
20	TOMATOES	31.12	31.12	31.12
21	VINEYARD			
	YEAR 1	8.09	8.17	8.17
	YEAR 2	19.79	19.98	19.98
	YEAR 3	27.58	27.85	27.85
	MATURE	29.98	30.28	30.28
22	WHEAT	17.34	17.29	17.38
	TOTAL	958.04	963.95	964.72

9/24/99 **SAN LUIS WATER DISTRICT**
1998 - CROP CONSUMPTIVE USE , ETc (IN)

FDR #	CROP	CROP YEAR	WATER YEAR	CALENDAR YEAR
1	ALFALFA	46.23	46.18	45.89
2	ALMONDS			
	YEAR 1	10.14	10.03	10.03
	YEAR 2	24.80	24.51	24.51
	YEAR 3	34.57	34.17	34.17
	MATURE	37.57	37.14	37.14
3	BARLEY	12.98	13.49	13.05
4	BEANS(DRY)	19.73	19.73	19.73
5	CORN(FIELD)	28.05	28.05	28.05
6	COTTON	31.16	31.06	31.06
7	DECIDUOUS ORCHARDS			
	YEAR 1	10.71	10.57	10.57
	YEAR 2	26.18	25.83	25.83
	YEAR 3	36.49	36.01	36.01
	MATURE	39.66	39.14	39.14
8	GRAIN SORGHUM(MILO)	20.50	20.13	20.13
9	GRAINS	14.39	14.89	14.47
10	MELONS	15.90	15.90	15.90
11	MISC. TRUCK FIELD CROPS(HIGH)	32.78	32.68	32.48
12	MISC. TRUCK FIELD CROPS(LOW)	12.12	12.23	12.12
13	MISC. TRUCK FIELD CROPS(MED)	22.45	22.46	22.30
14	NURSERY/LETTUCE	6.06	6.12	6.06
15	PASTURE(IMPROVED)	45.59	45.72	45.32
16	POTATOES	18.46	18.46	18.46
17	RICE	44.24	44.11	44.11
18	SUBTROPICAL ORCHARDS			
	YEAR 1	9.33	9.20	9.20
	YEAR 2	22.80	22.49	22.49
	YEAR 3	31.78	31.35	31.35
	MATURE	34.54	34.08	34.08
19	SUGAR BEETS	36.19	36.19	36.19
20	TOMATOES	28.03	28.03	28.03
21	VINEYARD			
	YEAR 1	7.60	7.51	7.51
	YEAR 2	18.59	18.35	18.35
	YEAR 3	25.91	25.58	25.58
	MATURE	28.16	27.80	27.80
22	WHEAT	12.70	13.15	12.76
	TOTAL	846.38	842.35	839.90

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX K

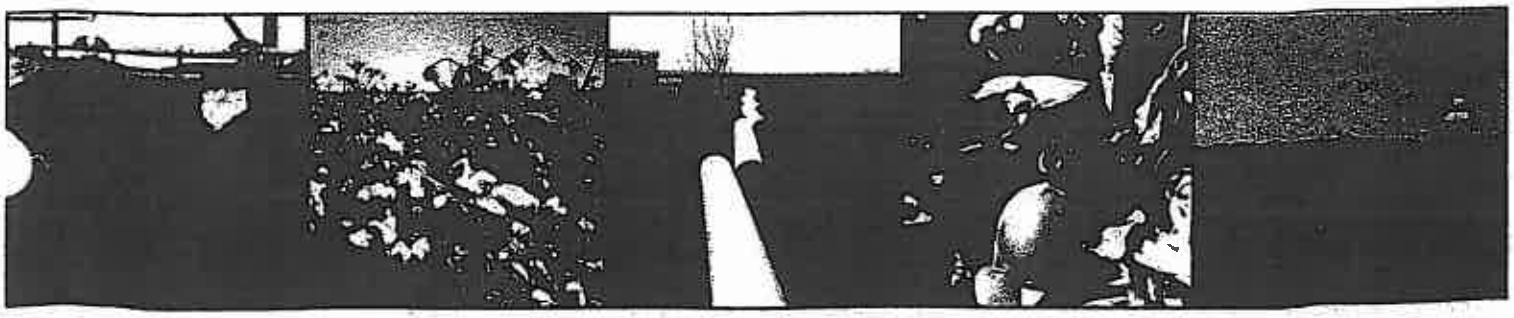
Westside Regional Drainage Plan

Westside Regional Drainage Plan

May 2003

Prepared By:

San Joaquin River Exchange Contractors Water Authority
Broadview Water District
Panoche Water District
Westlands Water District



Westside Regional Drainage Plan — AN OVERVIEW

Background:

The U. S. Bureau of Reclamation recently completed a San Luis Drain Feature Re-Evaluation Plan Formulation Report for the area located in the western San Joaquin Valley. The area consists of Westlands, Broadview, Panoche, Firebaugh, and Pacheco water districts and portions of San Luis Water District and Central California Irrigation District.

Long-established drainage practices for farmers in the north portion of the drainage service area are at immediate risk. Impending discharge standards will cut off vital drainage to the San Joaquin River by 2009. The Westside Regional Drainage Plan (Plan) is developed by the stakeholders and is designed primarily to quick-start identified drainage elements in time to meet standards. The initial projects in the Plan are the first steps needed for implementation of the USBR's San Luis Drain Feature Re-Evaluation Plan Formulation Report.

Plan Elements:

- The Plan identifies scientifically sound projects, develops an aggressive implementation plan, curtails discharge to the San Joaquin River in accordance with regulatory constraints.
- Accelerates Plan schedule by using existing adopted environmental documentation. The schedule provides for immediate drainage service implementation.
- Is fully supported by the local stakeholders including Westlands, Panoche and Broadview water districts, Central California Irrigation District, Firebaugh Canal Water District, and the San Joaquin River Exchange Contractors Water Authority.
- The local stakeholders are dedicated to working cooperatively with the USBR to achieve immediate implementation.
- Is consistent with the USBR's San Luis Drain Feature Re-Evaluation Plan Formulation Report. The main difference is the accelerated schedule for the provision of drainage.
- A key element is adaptive management combining investigation, construction of proven drainage components, and operational experience to perfect the final drainage strategy.
- The chief components include land retirement, groundwater management, source control, regional re-use, treatment, and salt disposal.

Table of Contents

Executive Summary

Drainage on the westside of the San Joaquin Valley has been studied for decades. Enormous investments of time and money have been spent developing theoretical drainage reduction strategies. Although many strategies are known to be effective, few projects have been implemented. For over 50 years, both State and Federal planners have recognized the need for a special drainage plan for the region. However, little has been done to actually implement such a plan.

Drainage for farmers in and adjacent to the Central Valley Project's San Luis Unit service area is at a crisis point. Present regulatory requirements for discharge from these lands to the San Joaquin River are nearly impossible to meet. Impending discharge standards will cut off current vital drainage to the San Joaquin River by 2009.

The Westside Regional Drainage Plan (Plan) is intended to: 1) identify scientifically sound projects proven to be effective by the government, local agencies and private consultants; 2) develop an aggressive implementation plan initially utilizing existing projects documented to be environmentally sound; and 3) curtail discharges to the San Joaquin River in accordance with impending regulatory constraints while maintaining the ability to farm.

Local stakeholders have formulated this Plan by integrating all consistent elements developed by government, local agencies, and private partnerships. Local stakeholders are dedicated to working cooperatively with the U.S. Bureau of Reclamation (USBR) to achieve immediate implementation.

The Plan focuses on regional drainage projects implemented on a short timeline. The initial projects of this Plan are the first steps needed for any of the Drainage Service Alternatives identified by USBR in their San Luis Drain Feature Re-Evaluation (Re-Evaluation) Plan Formulation Report, December 2002. Once these regional projects are in place, final disposal projects will be implemented. We concur with USBR that in-valley disposal appears to be the preferred alternative when considering cost, time to implement, implementation complexity, and environmental concerns. The Drainage Service Area is presented on Exhibit A. Identically to the Re-Evaluation, components include drain water reduction measures, irrigation drainage management, drainage collection, and drainage reuse. The Plan coordinates all strategies to meet regulatory requirements on time, to protect the environment and to sustain agriculture.

Adaptive management and implementation of drainage projects are essential. An educated landowners' group, working cooperatively with Federal, State and local agencies, and environmental interests, is the key for successful management. Local knowledge and cooperation, together with the resources of the State and Federal governments will ensure viable projects.

Drainage on the westside must be addressed on a regional basis. However, local districts and entities within each sub-area have specific needs and resources. The Plan for each sub-area must allow for implementation of the most efficient and effective specific drainage management while integrating these practices into one comprehensive program. Drainage cannot be effectively managed without equitably addressing each sub-area.

The Plan's key management components are: (1) Land Retirement, (2) Groundwater Management, (3) Source Control, (4) Regional Reuse Projects, (5) Drain Water Treatment, and (6) Salt Disposal. Each sub-area will implement a different suite of management practices that will be coordinated to alleviate drainage impacts throughout the region. By implementing management practices in the most effective areas, past, present and future drainage impacts will be mitigated.

Executive Summary Continued

As this coordinated drainage program is implemented, stakeholders will evaluate the long-term sustainability of the complete solution. The first phase of the Plan will be to implement the projects consistent with any ultimate disposal option. We concur with USBR that the preferred alternative is in-Valley treatment and disposal.

The implementation schedule for Phase I projects provides the time needed to perfect and implement the in-Valley option. If treatment proves ineffective, then the Plan provides the necessary immediate drainage relief and time to implement other disposal alternatives.

USBR has analyzed the proposed plan to retire up to 200,000 acres of land within the Westlands Water District. The San Luis Drain Feature Re-Evaluation identifies the remaining quality and quantity of drain water disposal required. The Re-Evaluation recalculates the costs of collection, conveyance, reuse, treatment and disposal. The cost savings to provide drainage by retiring 200,000 acres is on average 33% less expensive than without land retirement.

Background

The United States understood the need for drainage service for the San Luis Unit even before its initial authorization. The San Luis Drain was originally designed to transport drainage flows to the Sacramento-San Joaquin Delta for disposal to the ocean. The upper reaches of the San Luis Drain and Kesterson Regulating Reservoir were constructed, but due to political and environmental concerns, construction was never completed to the Delta. The drain was ordered closed during the mid-1980s creating the drainage dilemma we face today. In order to develop a long-term plan to provide drainage service to the westside, the State and Federal governments initiated the interagency San Joaquin Valley Drainage Program.

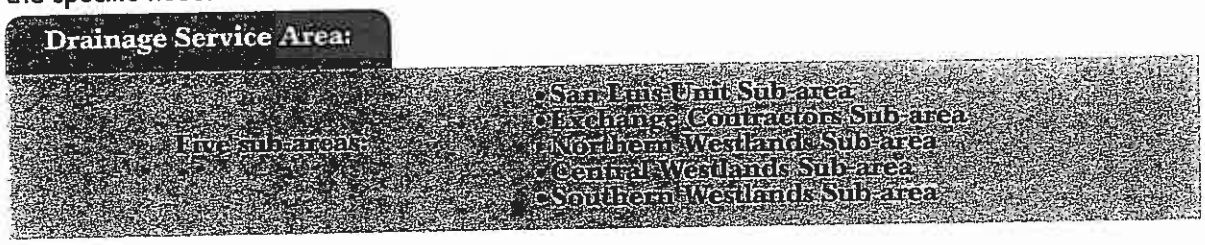
In 1990, the San Joaquin Valley Drainage Program published A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley, Final Report of the San Joaquin Valley Drainage Program (The "Rainbow Report"). The Rainbow Report outlined a management plan that included all of the key management practices contained in this Plan. In January 2000, the San Joaquin Valley Drainage Implementation Program issued a report titled Final Report, Evaluation of the 1990 Drainage Management Plan for the Westside San Joaquin Valley, California (2000 SJVDIP Report). The 2000 SJVDIP Report also identified the key management practices included in this Regional Drainage Plan. Currently, USBR has just completed the San Luis Drainage Feature Re-Evaluation to once again identify alternatives to provide drainage service to the Westside of the San Joaquin Valley. The key components of the USBR's current Re-evaluation effort are included in this Plan. The main difference between the USBR's efforts and this Plan are the inclusion of an adaptive management approach, shorter implementation timeline, and reduced cost of design, construction, and operation.

The adaptive management component of this Plan will allow the local interests to work with the USBR and other State and Federal agencies to adapt to practical experience gained through the continued implementation of on-the-ground projects. The local interests understand from experience with operating drainage projects that a successful effort must adapt to new information gained through constant evaluation of in-progress projects. The short implementation timeline of this Plan is essential in order to provide meaningful drainage service to the region. The regulatory constraints being imposed by various State and Federal agencies do not allow the region to wait while the USBR completes its study and begins design of a drainage alternative; drainage service is needed immediately. The Grassland Drainage Area must reduce its selenium discharges by 42% within the next three years and 55% percent within the next six years to meet regulatory requirements. Additional water quality regulations are being imposed on the region that further necessitates immediate action.

These regulatory constraints on drainage discharges further exacerbate the impacts to local growers. Shallow groundwater levels continue to rise causing serious impacts to crop production. Groundwater levels must be managed in order to prevent further hardships to family farmers and crop productivity. Large-scale drainage projects are needed immediately to provide meaningful relief from drainage-related impacts.

Current Drainage Management Activities

Significant drainage control efforts are ongoing within the Drainage Service Area. (See Exhibit B.) The efforts have been implemented to respond to the specific needs of the different sub-areas. The Drainage Service Area has been subdivided into five sub-areas; 1) the San Luis Unit Sub-area; 2) the Exchange Contractors Sub-area 3) the Northern Westlands Sub-area, 4) the Central Westlands Sub-area, and; 5) the Southern Westlands Sub-area.



Grassland Drainage Area

The Grassland Drainage Area is comprised of the San Luis Unit and Exchange Contractors sub-areas. The Grassland Drainage Area formed a regional drainage entity in March 1996 under the umbrella of the San Luis and Delta-Mendota Water Authority to implement the Grassland Bypass Project. Participants include the Broadview Water District, Charleston Drainage District, Firebaugh Canal Water District, Pacheco Water District, Panoche Drainage District, Widren Water District, and the Camp 13 Drainage District, located in part of Central California Irrigation District. The area comprises approximately 97,000 gross acres of irrigated farmland on the westside of the San Joaquin Valley. The area is highly productive, producing an estimated $113 million annually in agricultural crop market value, with an additional estimated $126 million generated for the local and regional economies, for a total estimated annual economic value of $239 million.

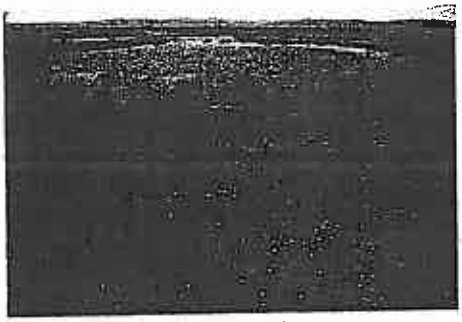
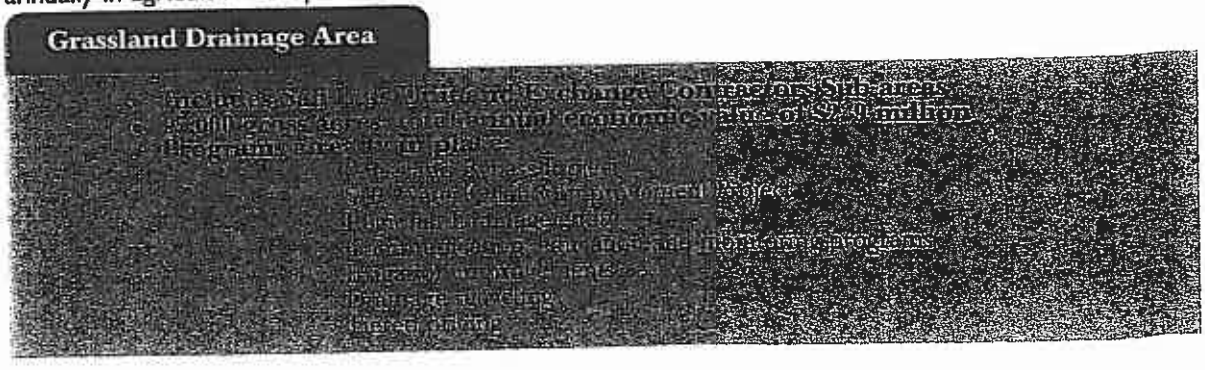


Photo Credit: Gary Zahm, USFWS

The Grassland Drainage Area farmers have implemented several activities aimed at reducing discharge of subsurface drainage waters to the San Joaquin River. These activities include the Grassland Bypass Project, the San Joaquin River Water Quality Improvement Project, formation of a regional drainage entity, distribution of newsletters and other farmer-oriented education series, development of a monitoring program, use of State Revolving Fund loans for improved irrigation systems, development and implementation of drainage recycling systems to mix subsurface drainage water with irrigation supplies under strict limits, tiered water pricing and tradable loads programs.



Current Drainage Management Activities Continued

Grassland Bypass Project

The entities within the Grassland Drainage Area have implemented the Grassland Bypass Project, an innovative program designed to improve water quality in drainage channels now used to deliver water to wetland areas. Prior to the project, subsurface drainage water was conveyed through these channels to the San Joaquin River and limited their availability to deliver habitat supplies. The Project consolidates subsurface drainage flows regionally and utilizes a portion of the federal San Luis Drain to convey the flows around the habitat areas to the San Joaquin River downstream of the Merced River confluence.

Negotiations between the San Luis and Delta-Mendota Water Authority and the USBR to utilize a portion of the San Luis Drain for the Project commenced in 1988. Stakeholders included in the process were the U.S. Environmental Protection Agency, U.S. Fish & Wildlife Service, California Department of Fish and Game, the Central Valley Regional Water Quality Control Board, Environmental Defense, Contra Costa County, and Contra Costa Water District.

In late 1995, environmental documentation for the first five years of the project was completed and an agreement was signed. Discharge through the project began in September 1996. In September 2001, the agreement was extended for another 8 years and 3 months through December 2009. An Environmental Impact Report/Environmental Impact Statement (EIR/EIS) was completed. On September 7, 2001, the Central Valley Regional Water Quality Control Board issued new Waste Discharge Requirements for the project. In addition, a Biological Assessment/Biological Opinion was completed as well as Total Maximum Monthly Load (TMML) reports submitted to the Regional Board and EPA. The agreement requires continued reductions in selenium discharge until ultimately TMML limits are achieved in 2005 for above-normal and wet years, and continued progress is made to meet water quality objectives in 2010 for below-normal, dry and critically dry years.

The benefits of the Grassland Bypass Project are well documented. In water year (WY) 2001, drainage volume was reduced by 47%, selenium load was reduced 56%, salt load reduced 28% and boron load reduced 41% compared to the pre-project conditions in WY 1996. In WY 1996, prior to the Grassland Bypass Project, the mean selenium concentration in Salt Slough at Lander Avenue was 16 parts per billion (ppb). Since October 1996, the 2 ppb water quality objective for Salt Slough has been met in all months except in February 1998 when uncontrollable flood flows were mixed with subsurface drainage water and could not be contained within the Grassland Bypass Project (that month the selenium concentration in Salt Slough was 4 ppb). In WY 1996, the mean selenium concentration at Camp 13 Ditch was 55.9 parts per billion (ppb). In WY 1997, the first year of operation of the Grassland Bypass Project, the mean selenium concentration at Camp 13 Ditch was 2.6 ppb. This value was slightly above the wetland selenium objective of 2 ppb. In April 1998, specific actions were taken to eliminate any possible subsurface drainage discharges from the Grassland Drainage Area into the Camp 13 Slough and other discharge points. Since that time, there have been no discharges from the Grassland Drainage Area into wetland channels.

Current Drainage Management Activities Continued

San Joaquin River Water Quality Improvement Project

The San Joaquin River Water Quality Improvement Project (SJRIP) is a major project undertaken by Grassland Drainage Area entities. The project, covered under the 2001 EIR/EIS, used Proposition 13 funds to purchase and improve 4,000 acres of land within the Grassland Drainage Area for the purpose of drainage water treatment and disposal. The initial Phase 1 projects of the SJRIP were implemented in the winter of 2001 with the planting of salt tolerant crops and construction of distribution facilities, which allowed for 1,821 acres to be irrigated with drainage water and/or blended water.

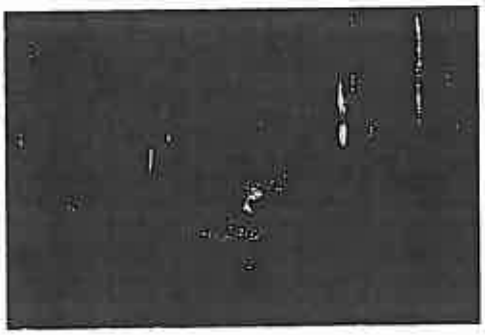


Photo Credit: Gary Zahm, USFWS

As a result, 1,025 pounds of selenium, 14,500 tons of salt, and 62,000 pounds of boron were retained and not discharged to the Grassland Bypass Project and to the San Joaquin River. The SJRIP project is the key component for the Grassland Drainage Area as a whole to meet future selenium load limits. This project will ultimately allow for planting and irrigation of the entire 4,000 acres with drainage water. Future phases call for acquisition of additional acreage, installation of subsurface drainage systems and implementation of treatment and salt disposal components.

A component of this future phase, the Grassland Integrated Drainage Management Project, is being implemented with Proposition 13 funds. Subsurface drains are being installed in 550 acres within the SJRIP area and irrigation systems improvements are underway so drainage water can be applied to this land and associated crops.

San Joaquin River Water Quality Improvement Project

SJR Water Quality Improvement Project:

- Salt tolerant crops irrigated with drainage water
- Project is key component to help meet any discharge load limit
- Improve acres in Grassland Drainage Area
- Drainage water treatment and disposal

Groundwater Management Pilot Project

In 2002, the San Joaquin River Exchange Contractors Water Authority (Exchange Contractors) in cooperation with the USBR implemented a pilot project to study the feasibility of using groundwater pumping to mitigate drainage impacts. The project involves pumping two wells above the Corcoran Clay but below the shallow groundwater. Although this water supply does contain elevated levels of salt, it contains no selenium.

This water supply is diverted into a surface supply canal and put to beneficial use on surrounding lands and refuges. In addition to the water supply being made available, the project also included monitoring of the shallow groundwater levels and discharges of nearby tile sumps. The 2002 project has demonstrated significant lowering of the crop root zone water levels by pumping groundwater from within the sierran sands located above the Corcoran Clay but below shallow selenium laden groundwater. It has long been identified that the sierran sands reduce selenium and can eliminate the constituent from groundwater discharges. This pilot project also showed reductions in nearby tile sump outputs.

The pilot project indicates that expansion of the groundwater management program is a viable component of the long-term drainage plan. Additionally, extensive modeling has demonstrated significant drain water source reduction benefits

Current Drainage Management Activities Continued

from groundwater pumping. Figure 1 (See Page 21) presents the modeled estimations of drainage discharge from the Exchange Contractors sub-area assuming several land retirement and pumping combination alternatives. The modeling results show that a carefully crafted and implemented groundwater management program alone can result in significant source reduction.

Groundwater Management Pilot Project:

- Using groundwater pumping to mitigate impacts
- Reduced crop root zone water levels
- Pumped zones are above Corcoran Clay, below shallow groundwater

Westlands Drainage Area

Westlands Water District (Westlands) includes more than 560,000 irrigated acres of diversified crops on some of the most productive soil in the world. Large portions of the westside of the San Joaquin Valley are affected by salinity and drainage problems. This affected area includes approximately 200,000 acres of farmland within Westlands. The U.S. government has long been aware of these problems, and congressional authorization of the facilities to deliver Central Valley Project (CVP) water to Westlands mandated drainage service as part of this project. Accordingly, provisions for drainage service were expressly included in Westlands water service contract with the USBR.

Construction of drainage facilities began in 1968. By 1975, concerns over costs and possible environmental issues led to a suspension in construction. Increased environmental concerns led to the closure of existing drainage facilities in 1986, and Westlands and other districts served by the San Luis Unit of the CVP have been without drainage service since that time.

In 1999, Westlands initiated a process to purchase approximately 14,000 acres of land with shallow groundwater problems and within the area identified by the USBR as needing drainage service.

In addition, 1,443 acres have been retired under the USBR's Land Retirement Demonstration Project. As the land was purchased, the water supply that was historically applied to that land was reallocated to the remaining lands in the District. The District developed an agricultural lease program for these lands, which allows lessees to dry land farm and maintain it according to District specifications. The USBR has been using its land for habitat restoration.

In 2002, Westlands approved an agreement to settle that portion of *Sagouspe, et al., v. Westlands Water District*, et al., concerning how the District will allocate Central Valley Project water to the Area I Lands and Area II Lands after December 31, 2007, or after a long-term renewal contract, which is currently being negotiated with the USBR, is executed and becomes effective. The agreement is the product of lengthy negotiations between Area I and Area II representatives. Under the settlement agreement, the District will acquire additional lands and the water appurtenant to those lands will be allocated as provided in the settlement agreement.

The proposed plan shows acquisition of 100,175 irrigable acres through the issuance of debt. This total includes the 13,978 acres previously taken out of agricultural production and lands to be acquired through the settlement of other litigation. These lands will be temporarily fallowed and managed by the District.

Westlands Drainage Area:

- No natural drainage
- No drainage service since 1986
- District land buy-out program
- Proposed plan shows acquisition of 100,175

Key Management Practices

This Regional Drainage Plan proposes the expansion of the current drainage management practices into a comprehensive sustainable drainage program. In order to implement a sustainable drainage program, all management practices must be integrated to provide long-term salt balance in the region. While the goal of salt balance is the same for each sub-area, the most efficient suite of management practices designed to achieve salt balance may vary among sub-areas. Therefore, each sub-area will emphasize different management practices in their drainage program.

With the goal of maintaining a salt balance in the region, the management plan will implement on-the-ground management practices on an increasingly larger scale. As practices are shown to be effective they will be expanded. The process will build upon past research and evolve into a fully developed integrated in-Valley drainage control effort. The districts will implement drainage control efforts appropriate for their specific needs. The implementation of the district efforts will be coordinated with input from USBR and will be integrated into one comprehensive program.

The key management practices are: (1) Land Retirement (2) Groundwater Management (3) Source Control (4) Regional Reuse Projects (5) Drain Water Treatment (6) Salt Disposal. These components are described in more detail below.

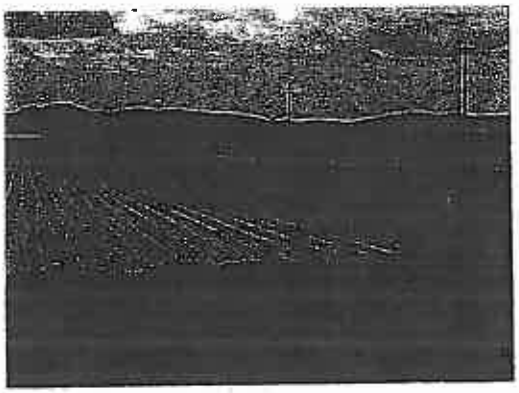


Photo Credit: Central California Irrigation District

Key Management Practices for a Sustainable Drainage Program:

1. Land Retirement
2. Groundwater Management
3. Source Control
4. Regional Reuse Projects
5. Drainage Water Treatment
6. Salt Disposal

Land Retirement

Land retirement is a key component of the Plan. By retiring drainage impacted land on a voluntary basis the need for future drainage service on these lands will be reduced. The retired lands will no longer be irrigated with surface supplies, which will reduce the impacts of deep percolation from these lands. To the extent possible, groundwater pumping will continue throughout the areas where land retirement occurs. Modeling shows a significant drain water source reduction from such a combination.

The land will become available for other uses such as regional drainage reuse projects, commercial and industrial use, flood control, surface water storage where appropriate, and wildlife habitat. Each project will be strategically located to maximize the benefits to the region. For example, drainage reuse projects will be located to maximize their ability to mitigate past drainage impacts and eliminate future regional impacts from land that remains in production. Each land use choice will be coordinated into an overall program designed to maintain a viable environment and economy.

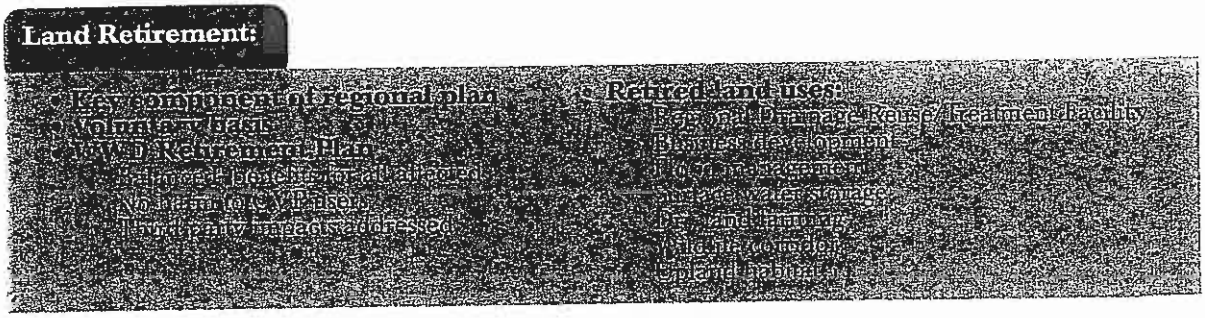
The land retirement component of the Plan will be to buy land from willing sellers in areas currently impacted by shallow groundwater. The water supply from this land will remain with the region so long as appropriate drainage mitigation programs are effectively implemented consistent with this Plan. Specific measurable criteria will be developed to document that the drainage management measures are effective at mitigating past, present, and future drainage impacts resulting from irrigation within the region.

Key Management Practices Continued

Westlands Water District Land Retirement Plan

As previously indicated, each area will place different emphasis on each management practice. Westlands Water District plans significant land retirement within their area. At the present time, the general outline of the Westlands Water District land retirement plan is as follows:

- Up to 200,000 acres of drainage-impacted land will be purchased from individual landowners, permanently removing the land from irrigated agricultural production. Title to these lands would be retained by Westlands and/or a nonprofit entity, and put to beneficial uses such as wildlife habitat, dry land farming, or related economic development activities. Westlands would manage the retired lands in ways compatible with continuing agriculture on the remaining farmlands.
- The plan must provide balanced benefits for all affected parties.
- The plan must provide farmers a fair and reasonable price for their land, with values determined as if those lands had drainage services provided.
- The program must be voluntary, involving only willing sellers.
- No harm or loss of water should occur to any other CVP water user.
- Third-party impacts must be identified and addressed.



Potential Uses of Retired Land within Westlands

Westlands has begun a preliminary investigation into the potential alternative uses of the retired land, with the objective of administering those lands to achieve broader benefits for the District and region. This land will become available for other uses such as regional drainage reuse projects, commercial and industrial use, flood control, surface water storage where appropriate, and wildlife habitat. Each project will be strategically located to maximize the benefits to the region.

For example, drainage reuse projects will be located to maximize their ability to mitigate past drainage impacts and eliminate future regional impacts from land that remains in production. Each land use choice will be coordinated into an overall program designed to maintain a viable environment and economy. Title to these lands would be retained by Westlands and/or a nonprofit entity.

Key Management Practices Continued

To date, the following potential uses for the land have been considered:

- Regional Drainage Reuse and Treatment / Disposal
- Highway 180 Business Corridor
- Panoche/Silver Creek Detention Basin
- Arroyo Pasajero Flood Control Project
- Surface Water Storage (where appropriate)
- Dry Land Farming, Hunting Opportunities
- Wildlife Corridor
- Upland Habitat Development

Regional Drainage Reuse and Treatment

Westlands anticipates that lands adjacent to the retired area will still need drainage service with a focus on treatment and reuse. Retired lands can be used as regional reuse projects to provide drainage for lands remaining in production and to mitigate for past drainage impacts. The facilities would be designed and operated similar to the project identified in the USBR's Plan Formulation Report of the San Luis Drainage. The beneficiaries of this project would include: Westlands, landowners who need drainage service, and the USBR since it will be relieved from providing drainage service at a significant cost to the US.

Highway 180 Business Corridor

This project allows land along the proposed Highway 180 alignment to be used for commercial and industrial activities. Land could be made available to local communities impacted by land retirement and land fallowed as a result of decreased water supplies resulting from the implementation of CVP Improvement Act. Beneficiaries from this project would include the City of Mendota, County of Fresno, and Westlands.

Panoche/Silver Creek Detention Basin

This project consists of constructing a detention basin to collect and attenuate flood flows from Panoche/Silver Creek and discharge a constant flow to the Fresno Slough. Historically, flows from Panoche Silver Creek have flowed out from the channel and down to the City of Mendota flooding parts of the city, depositing silt on county and state roadways, and damaging adjacent crop land. Westlands expects this activity will also be administered by the Panoche Silver Creek Coordinated Resource Management and Planning Program. The beneficiaries would include the City of Mendota, County of Fresno, CALTRANS, landowners, and the U.S. Army Corps of Engineers.

Key Management Practices Continued

Arroyo Pasajero Flood Control Project

Retired lands could be used to construct a detention basin to collect and attenuate flood flows from the Arroyo Pasajero. The Corp of Engineers completed a report to construct a 50,000 acre-foot reservoir to attenuate the flows from the creek; however, the cost-benefit ratio did not support construction of the project. As an alternative, DWR is investigating a proposal to divert Arroyo Pasajero flows into the California Aqueduct, transport them downstream, and then divert the waters into the Tulare Lake Bed. As an alternative, which is less expensive and easier to implement, Westlands is proposing to divert the Arroyo Pasajero flows onto land retired in the District. The beneficiaries of this project would be the City of Huron, County of Fresno, CALTRANS, U.S. Army Corps of Engineers, California Department of Water Resources, State Water Contractors, and the CVP contractors.

Surface Water Storage

The project consists of constructing a series of storage basins on eight sections (5,120 acres) adjacent to Westlands Laterals 6 and 7 within Township 15 South and Range 15 East. The Project will have an estimated 40,000 to 50,000 acre-feet of storage for rescheduled water, surplus water, and water from other sources including refuges, San Joaquin River flood flows, and other CVP contractors. In addition to the storage benefit, the project will be near the Mendota Wildlife Area and will provide habitat for migratory birds, and with this benefit, other partners could be willing to contribute to the project. This project will be designed to prevent impacts to shallow groundwater due to seepage.

Dry Land Farming, Hunting Opportunities

Currently, Westlands is leasing out land acquired by the District for lessees to farm. Since these lands do not have a CVP allocation, dry land farming is the best alternative. Typically, lessees will plant a winter or spring grain on the land, which will be harvested or used for livestock grazing. Retired lands can be dry land farmed with grains and other crops to provide food and habitat for wildlife. Beneficiaries include Westlands, wildlife, and the local economy.

Key Management Practices Continued

Wildlife Corridor

Westlands has been meeting with the USBR, California Department of Fish and Game, and U.S. Fish and Wildlife Service to discuss restoring acquired and retired land for wildlife purposes. Both wildlife agencies are interested in restoring an east-west and north-south corridor to allow species to migrate to different lands and different areas of the District.

In addition to using dedicated retired lands for a wildlife corridor, Westlands would also work with landowners with permanent crops, which could also be used for a corridor. Beneficiaries of this project include the California Department of Fish and Game, U.S. Fish and Wildlife Service, and Valley species.

Upland Habitat Development

Similar to the Wildlife Corridor Project, Westlands has been meeting with the USBR, California Department of Fish and Game, and U.S. Fish and Wildlife Service to discuss restoring acquired and retired land for upland habitat purposes. Retired lands can be restored to upland habitat similar to the USBR demonstration project for animal and plant species. Beneficiaries include the USBR, the California Department of Fish and Game, U.S. Fish and Wildlife Service, and Valley species.

Photo Credit:
Gary Zahm, USFWS

Groundwater Management

Groundwater management will be used to meet several goals of the drainage management program. These goals include: 1) limiting the advance of sub-surface drainage; 2) maintaining groundwater below the crop root levels; 3) mitigating the impacts from the lack of historical drainage service; 4) providing necessary interim drainage management until disposal options are developed; and 5) developing an additional water supply for beneficial uses, such as Level 2 refuge supplies during the life of the project.

Studies conducted by the Federal government and others have identified that groundwater management is a suitable strategy to provide drainage within the region. The studies conclude that extraction of groundwater above the Corcoran Clay will lower groundwater levels and reduce drainage water production. Also using a groundwater flow model, specifically designed for the region (Belitz) the U.S. Geological Survey estimated the beneficial effects from pumping on levels and flows.

Key Management Practices Continued

The Belitz model demonstrates significant drain water source reduction benefits from groundwater pumping. Figure 1 (see page 21) presents the modeled estimations of drainage discharge reduction from the Exchange Contractors sub-area. The modeling indicates that groundwater management is a key component of any drainage program.

Groundwater pumping also is needed to manage the advance of poor quality groundwater northeasterly towards the City of Firebaugh and the San Joaquin River. The San Joaquin River Exchange Contractors Water Authority AB3030 groundwater monitoring effort has documented this advance and concluded that groundwater pumping is needed to manage the advance.

In addition, groundwater pumping is needed in order to extract the accumulated drainage water from the shallow groundwater. The accumulation is from the many years of irrigation of crop lands without the ability to drain. The resulting imbalance in the water budget within the region has caused the shallow water table to rise. Surface water has been applied at rates that exceed the carrying capacity of the groundwater system resulting in increase groundwater storage in shallow zones. A groundwater pumping program would be designed to extract the accumulation to pre-CVP levels.

The Groundwater Management Plan will develop a usable water supply during the life of the project. It has been shown that water from well below the root zone and above the Corcoran Clay, while generally high in salinity, does not contain selenium. This selenium-free water can be used to augment water supplies for regional re-use projects, wildlife habitat and traditional farming without creating potential problems associated with selenium-laden water.

A Groundwater Management Program is currently in the early stages of deployment through a set of studies and pilot projects focused on immediate drainage relief. Program progress is managed through a monitoring analysis and refinement system designed to maximize benefits and direct project component development. It is expected that the program will include the following steps:

1. Identify the acceptable water quality standards for the various water supply needs in the area. As an example, the Grassland Drainage Area (GDA) 4,000-acre experimental salt removal project has an additional need for water supply in the 2,500 parts per million (ppm) total dissolved solids (tds) range. Additionally, an investigation is being conducted to determine whether a portion of the well water could be blended with better quality Delta-Mendota Canal water and used within the Grassland Water District. On the basis of the required standards, identify potential production areas with acceptable groundwater quality through evaluation of existing data, pilot project data, and additional samples to be collected for this purpose. The results will provide preliminary groundwater volumes and production area estimates for the future pumping strategy.

2. Modify, update and develop analytical tools. The U.S. Geological Survey groundwater-flow model is the primary tool to analyze the proposed pumping strategy. Necessary updates include: a) extension of model boundaries to include all of the area; b) reevaluation of boundary conditions for potential impacts on the pumping assessment and modification as necessary; c) representation of drainage systems in greater detail; d) revise model time-steps to provide seasonal information, review and revise hydraulic conductivity data; and e) revise sub-area boundaries. Portions of these work tasks are currently being accomplished and are in various stages of completion.

3. Utilize analytical tools to identify preferred production areas and develop a preliminary pumping strategy. The groundwater-flow model and an optimization program will be used to estimate the mixture of pumping volumes to optimize water quality. The groundwater-flow model will be utilized to determine pumping amounts and locations to minimize drainage water production, possible subsidence effects, and maximize management of poor groundwater migration. Solute transport modeling updated using recent pilot project data will be used to calculate the expected operation life of the pumping strategy.

Key Management Practices Continued

4. Design and implementation of further field-scale pilot projects to evaluate the pumping in areas most likely to result in successful drainage and/or water level reductions and yield good quality water. Collect water level, drainage and pumping data. Measurement of pumping volumes will be critical for effective evaluation of the project. Implementation of initial field-scale pilot projects is currently under way with results from the monitoring indicating good results towards successful drainage management.

5. Incorporate pilot projects results into the model and reevaluate pumping using the new information. Integrate pumping into the overall drainage management strategy.

6. Conduct necessary environmental and additional legal analysis.

7. Fully integrate pumping into the overall drainage management strategy; install necessary wells and integrate these existing wells into the water supply system.

Groundwater Management:

- Develop new water supply
- Maintain groundwater below crop root zone
- Mitigate lack of drainage service
- Necessary interim management
- Limit advance of subsurface drainage

Source Control

Source control is the first line of defense in the battle to control subsurface drainage. Farmers in the region have implemented various irrigation improvements by taking advantage of funding through the State Revolving Fund (SRF) and other sources to improve irrigation practices. These practices include conversion to ¼-mile furrows, sprinkler systems and drip irrigation systems. Experimentation has also proceeded with timing of pre-irrigation and shallow drainage management to reduce deep percolation. These practices and new improvements will continue to be implemented to further reduce the production of subsurface drainage water that has to be managed by other means. It is assumed funding will be utilized through various sources including SRF loans or other loan/grant sources.

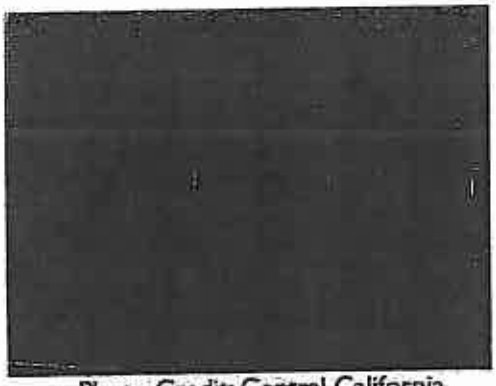


Photo Credit: Central California Irrigation District

In addition to on-farm measures, such as improved irrigation practices, there are regional source control measures that likely would be implemented on a regional level by districts or other regional entities. These would include lining of surface water delivery canals to reduce seepage losses that contribute to subsurface drainage and implementation of uses of drainage water for displacement projects, such as replacing fresh water dust control with permanent systems or water trucks using drainage water.

Source Control (drainage volume reduction):

- Reduce drainage volume through improved irrigation on-farm
- Regional efforts to reduce drainage:
- Reduce seepage loss in canals
- Use drainage water for dust management

Key Management Practices Continued

Regional Drainage Reuse

Reuse is the application of subsurface drainage water (either directly or slightly diluted) to salt tolerant crops. The purpose is to reduce the volume of the subsurface drainage water for ease in treatment.

Reuse is different from recycling in that recycled water is minimized for maximum yield on salt sensitive crops. Reuse is maximized for drainage quantity reduction. Crops used for reuse would include salt tolerant alfalfa, pasture or halophytes.

These crops would not necessarily be grown for returns on yield but for drainage volume reduction.

Lands used for reuse would have to be managed to maintain adequate salt levels in the fields for the crops grown. This would likely entail installing of subsurface drains under the reuse fields so an adequate leaching fraction can be maintained. It is assumed that approximately 4 acre-feet per acre could be applied on the reuse crops with leaching fraction of about 27% or 1 acre-foot per acre. So there is a 73% reduction in volume through the reuse projects. The reuse projects are essential to any long-term drainage plan.

These projects will be modeled after the San Joaquin River Water Quality Improvement Project (SJRIP) that has already been partially implemented within the Grassland Drainage Area. Within Westlands Water District, portions of the land purchased under the land retirement program that are best suited to mitigate past and future drainage impacts will be used to implement these regional reuse projects. The land will be used to grow salt tolerant crops as a means to utilize water collected by shallow agricultural tile sumps as well as water generated by shallow well pumping described above in the groundwater management section. These projects will reuse drainage water in order to reduce the volume of and increase the efficiency of treatment. These types of projects have been proven effective and will be integrated into the entire regional approach to maximize drainage water use and minimize drainage impacts.

Specific locations will be selected to implement large-scale reuse projects to mitigate regional drainage impacts. These sites will be selected based upon the ease of delivering drainage flows to the area, the regional benefits from intercepting drainage flows on the property, and the availability of the property. Preliminary investigations indicate that, in addition to retired lands within Westlands, portions of Broadview Water District and areas on the northern edge of the Grassland Drainage Area are potential candidates for regional reuse projects.

These projects will reuse drainage water in order to minimize flows for more efficient treatment. Drainage water will be applied to salt tolerant crops such as pasture and alfalfa. These crops will be marketed when possible to reduce costs of the project. While the crops will be marketed the primary factor in planting decisions will be drainage reduction not crop production. The agricultural activity will also provide jobs in the region and help maintain retired ground to avoid impacts to surrounding farmland. Subsurface tile lines will be installed on the reuse projects to collect water that percolates from the irrigation. This water will be reused, treated or placed in evaporation ponds.

Regional Drainage Reuse:

- Reuse subsurface water on salt tolerant crops
- Maximized for drainage volume reduction
- Crops grown mostly for drainage, not commercial purposes

Key Management Practices Continued

Drainage Water Treatment

Drainage water treatment is another essential component of a regional drainage solution. Drainage water collected from the regional drainage projects described above will require treatment to further reduce its volume, remove salt and allow for more cost-effective disposal of the residue.

This treatment will consist of reverse osmosis and other membrane systems, chemical reduction systems as well as flow-through wetland systems. Pilot projects exist for all of these treatment systems. The region will expand these pilot programs to find the most effective system to treat the drainage water.

It is anticipated that irrigation efficiency, source control, groundwater management and regional reuse projects can reduce the amount of drainage water by 82%. However, to eliminate discharge to the San Joaquin River the remaining water needs to be managed. Pilot treatment plants are being implemented within the Grassland Drainage Area. These investigations include membrane treatment for removal of salt, selenium, and boron as well as flow-through selenium removal systems. The membrane systems for pretreatment and salt removal are showing water recovery of up to 92% and salt removal of up to 98%. The system also is showing promise on accomplishing this with reduced power requirements. These pilot projects will continue for the next five years. Selenium treatment systems are showing a high percentage of selenium removal. Investigations are continuing on the removal of selenium through cropping in reuse areas.

The products of these treatment systems will be improved quality water and concentrated brine. The water will be made available to augment regional water supplies. Some of this water may be of such high quality to be used for municipal and industrial supplies. This water will be marketed to help offset the costs of the treatment process. After treatment the resulting brine solution must be disposed of or utilized.

Drainage Water Treatment:

- Treatment to reduce volume, remove salts, allow for cost-effective disposal.
- Reverse osmosis membrane systems
- Pretreatment and salt removal shows water recovery at 92%, salt removal at 98%

Salt Disposal

Salt disposal is the final stage of the drainage solution. Initially, the brine solution could be stored in waste containment facilities, including evaporation ponds, built on retired land. Ultimately, it may be possible to market some of this product for uses ranging from construction materials to dying textiles. An aggressive investigation into potential markets for reclaimed salts should be implemented. If successful, this investigation could result in the most economical and environmentally favored alternative for salt disposal. If a viable market for reclaimed salt is not developed then, as an alternative, salts could be collected in waste containment facilities and stored indefinitely. Evaporation ponds and solar evaporators will be used to concentrate the

Key Management Practices Continued

brine into sludge or dry crystals for ultimate utilization and disposal. Final disposal also could be into permitted disposal sites. Recent legislation has acknowledged the need for on-site disposal of salt.

While the need for ultimate salt disposal is obvious, the best method for this disposal is unclear. Any final salt disposal option must be economically viable and environmentally sound. In an effort to find the best disposal option, the parties will explore a wide variety of disposal methods. The ultimate disposal option will be selected based upon economic, environmental and practical considerations. Determination of the best disposal method will require significant efforts by all parties, but these efforts will result in a comprehensive drainage program.

Salt Disposal:

- Preferred alternative in current analysis
- Final stage of drainage solution
- Possible market for salt product
- Permitted disposal sites

Adaptive Management Approach

This Plan will utilize adaptive management to find the most effective and efficient drainage solutions. Districts in the region will coordinate their activities with input from USBR. Each of the districts will participate in a group to manage the regional activities and document the program's progress. The members will work with the USBR, and other State and Federal agencies to ensure the most effective program possible. This Plan establishes a three-phased approach to establishing drainage service. The phased approach will allow the districts to modify their activities according to the most recent developments in drainage control.

The group will analyze specific management efforts and refine them as needed to meet the goal of sustaining agriculture while addressing regulatory issues. When particular practices are shown to be viable they will be expanded. When the analysis indicates that other practices are deficient they will be refined or abandoned. This process will serve as a practical test of the drainage reduction concepts developed over the last several decades.

Each of the districts supporting this approach has specific resources and expertise that can be used to find long-term in-Valley solutions. If after the region has made a focused effort to reduce drainage impacts through in-Valley solutions and these practices do not prove to be the total drainage solution, then an out-of-Valley solution can be more thoroughly explored. The projects, expertise and knowledge the region develops through this process will greatly benefit regional drainage control in both the short- and long-term.

Phase I Drainage Plan from 2003 to 2009

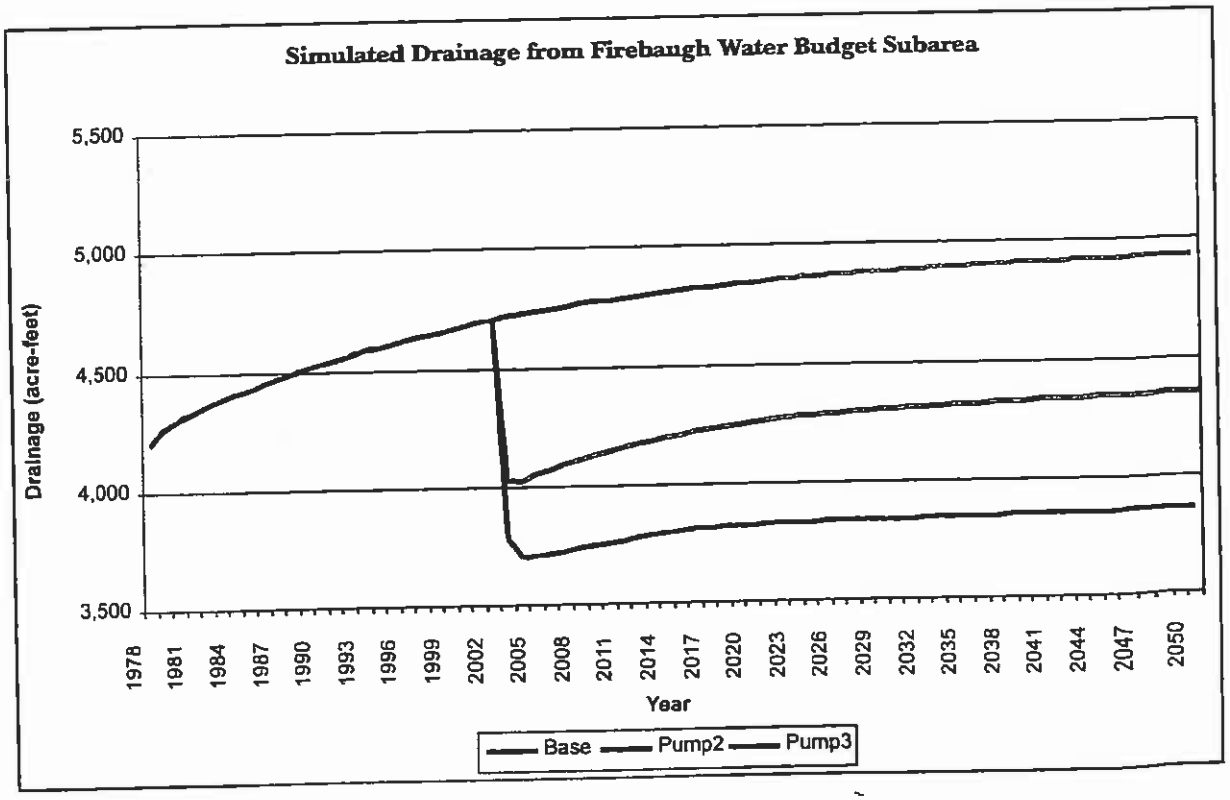
The region will implement the drainage management projects, which are generally located on Exhibit C.

Figure 2 presents the proposed timeline and cost estimates for implementation for Phase I.

All Sub-areas

- Adaptive management of SJRIP and Groundwater Management Programs.
- Expand and develop reuse areas.
- Continue implementation of proven treatment programs,
- Implement other viable land use options evaluated in Phase I,
- Finalize in-Valley treatment and disposal, or select and implement other disposal alternative,
- Implement salt disposal program,
- Evaluate success of the Drainage Management Program,

Figure 1



Base Continue existing conditions.
Pump 2 Retire , 25,000 AF/yr pumpage from beneath Firebaugh Subarea (95% above corcoran).
Pump 3 Retire , 50,000 AF/yr pumpage from beneath Firebaugh, Broadview, Panoche, and WWD.

Firebaugh subarea includes CCID and FCWD.

Phase II
Drainage Plan

Figure 2

Westside Regional Drainage Plan
Project Funding and Implementation for Phase I

Year	Item	Estimated Cost	Sub-Area	Comment
2003	Land Retirement Monitoring	$200,000	3	Calfed & Local
	Groundwater Management	$900,000	1,2,3	5 wells Total - 4500af Water Supply & Calfed
	SJRIP Phase I Completion	$2,000,000	1,2	SJRIP, USBR Plan, Prop 50, Prop13 and Local
		$3,100,000		
2004	Land Retirement	$100,000,000	3,4,5	"Up to" amount based on Implementation
	Groundwater Management	$600,000	1,2,3	8 Wells Total - 6500 af Water Supply & Calfed
	GW Conveyance Legal & Engineering	$3,000,000	1,2,3	Long Term Water Supply
	SJRIP Phase I Completion	$3,000,000	1,2	SJRIP, USBR Plan, Prop 50, Prop13 and Local
	Treatment Legal & Engineering	$2,000,000	1,2,3	USBR Plan
		$108,600,000		
2005	Land Retirement	$100,000,000	3	"Up to" amount based on Implementation
	Groundwater Management	700,000	1,2,3	11 Wells Total - 9500af Water Supply
	GW Conveyance Construction	$10,000,000	1,2,3	Long Term Water Supply
	SJRIP Plumbing	$950,000	1,2	SJRIP & USBR Plan
	SJRIP Phase 2 Expansion	$8,100,000	1,2	SJRIP & USBR Plan
	SJRIP Phase 2 Development	$2,300,000	1,2	SJRIP & USBR Plan
	Treatment Legal & Engineering	$2,000,000	1,2,3	SJRIP & USBR Plan
		$124,050,000		
2006	Land Retirement	$100,000,000	3,4,5	"Up to" amount based on Implementation
	Groundwater Management	$800,000	1,2,3	14 Total Wells - 12500af Water Supply
	GW Conveyance Construction	$10,000,000	1,2,3	Long Term Water Supply
	SJRIP Phase 2 Development	$5,000,000	1,2	SJRIP & USBR Plan
	SJRIP Phase 3 Expansion	$5,000,000	1,2	SJRIP & USBR Plan
	Treatment Legal & Engineering	$4,000,000	1,2,3	SJRIP & USBR Plan
		$124,800,000		
2007	Land Retirement	$100,000,000	3,4,5	"Up to" amount based on Implementation
	Groundwater Management	$850,000	1,2,3	17 Total Wells - 15500af Water Supply
	SJRIP Phase 3 Expansion	$7,100,000	1,2	SJRIP & USBR Plan
	SJRIP Phase 3 Development	$7,300,000	1,2	SJRIP & USBR Plan
	Treatment Construction	$21,000,000	1,2	SJRIP & USBR Plan
		$136,250,000		
2008	Land Retirement	$100,000,000	3,4,5	"Up to" amount based on Implementation
	Groundwater Management	$1,000,000	1,2,3	20 Total Wells - 19500af Water Supply
	Treatment Construction	$21,000,000	1,2	USBR Plan
		$122,000,000		

NOTE: The Land Retirement includes development of the key management practices such as regional reuse and treatment, dry land farming, etc.

Sub Area
1 San Luis Unit Sub-Area
2 Exchange Contractors Sub-Area
3 Northern Westlands Sub-Area
4 Central Westlands Sub-Area
5 Southern Westlands Sub-Area

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- San Luis Unit – Central Valley Project – California – Special Report on Drainage and Water Service Draft Supplement to Final Environmental Statement – USBR – September 1984

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- Detailed Options Descriptions – San Luis Unit Drainage Program, U.S. Department of the Interior, Bureau of Reclamation Mid-Pacific Region – Prepared by Davids Engineering – August 17, 1990

- Plan Formulation Appendix – San Luis Unit Drainage Program – Prepared for U.S. Department of the Interior, Bureau of Reclamation Mid-Pacific Region – Prepared by CH2MHILL Sacramento, California in association with U.S. Department of the Interior, Bureau of Reclamation Denver office – December 1991

- Westlands Sub-area Report – Prepared for the San Joaquin Valley Drainage Implementation Program – Westlands Water District – October 1998

- Task 1 – Drainage Reuse – Final Report February 1999 – Drainage Reuse Technical Committee – The San Joaquin Valley Drainage Implementation Program and The University of California Salinity/Drainage Program

- Task 3 – Land Retirement – Final Report February 1999 – Land Retirement Technical Committee – The San Joaquin Valley Drainage Implementation Program and The University of California Salinity/Drainage Program

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- Task 6 – Groundwater Management – Final Report – April 1999 – Groundwater Management Technical Committee – The San Joaquin Valley Drainage Implementation Program and The University of California Salinity/Drainage Program

- Final Report – Evaluation of the 1990 Drainage Management Plan For the Westside San Joaquin Valley, California – Submitted to the Management Group of the San Joaquin Valley Drainage Implementation Program – January 2000 – Prepared by SJVDIP and The University of California Ad Hoc Coordination Committee

- The San Joaquin Valley Implementation Program reports can be found at the following web site: http://wwwdpla.water.ca.gov/agriculture/drainage/implementation/hq/sjvlib.htm

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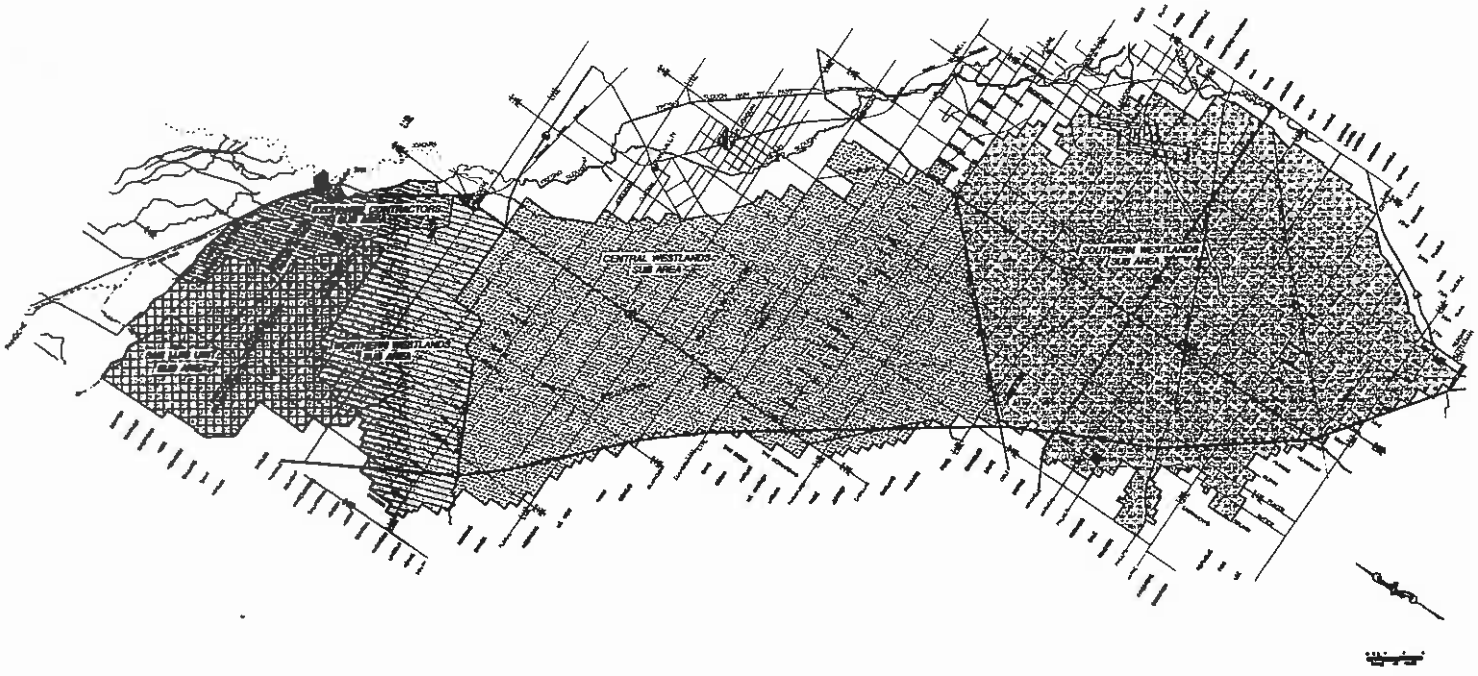
- The Rainbow Report - A Management Plan for Agricultural Subsurface Drainage And Related Problems on the Westside San Joaquin Valley, September, 1990

- San Luis Drainage Feature Re-Evaluation Plan Formulation Report. Prepared by the U. S. Department of the Interior Bureau of Reclamation, Sacramento California, December 2002

DRAINAGE SERVICE AREA



- GRASSLAND DRAINAGE AREA
- EXCHANGE CONTRACTORS SUB AREA
- SAN LUIS UNIT SUB AREA
- WESTLANDS DRAINAGE AREA
- NORTHERN WESTLANDS DRAINAGE AREA
- CENTRAL WESTLANDS DRAINAGE AREA
- SOUTHERN WESTLANDS DRAINAGE AREA

EXHIBIT "A"

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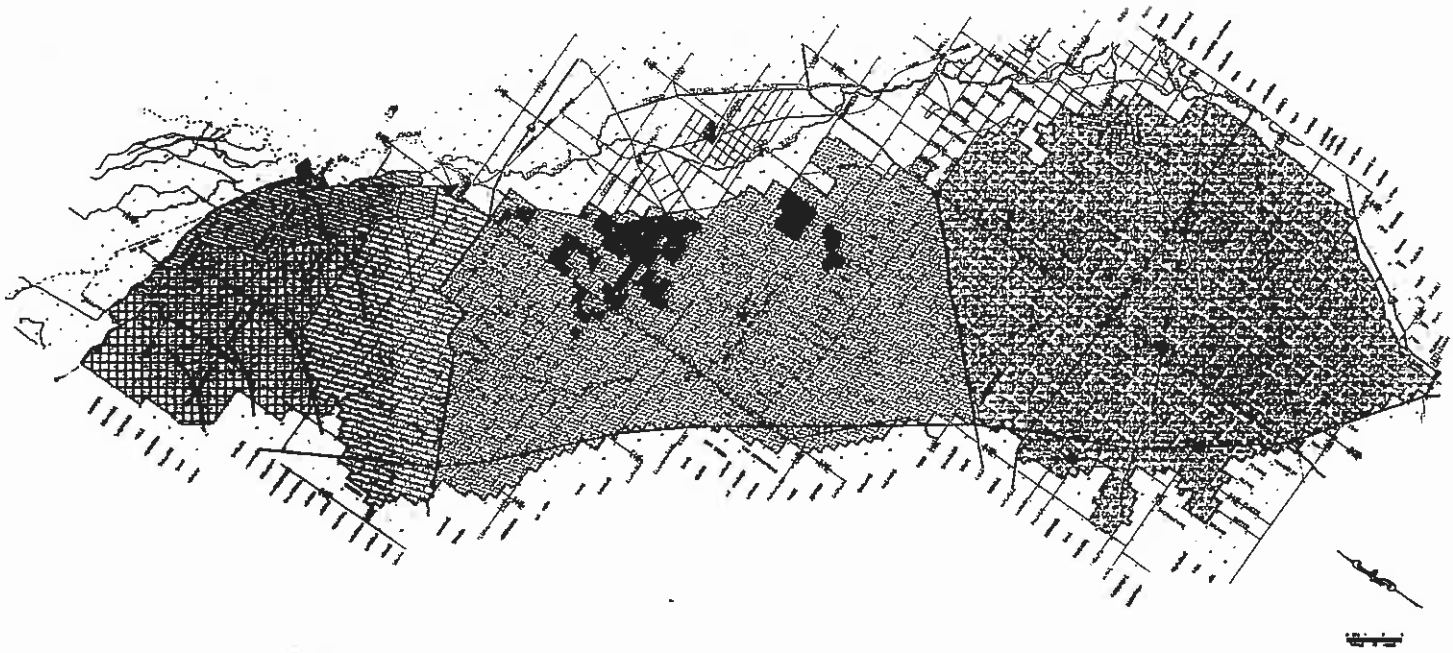
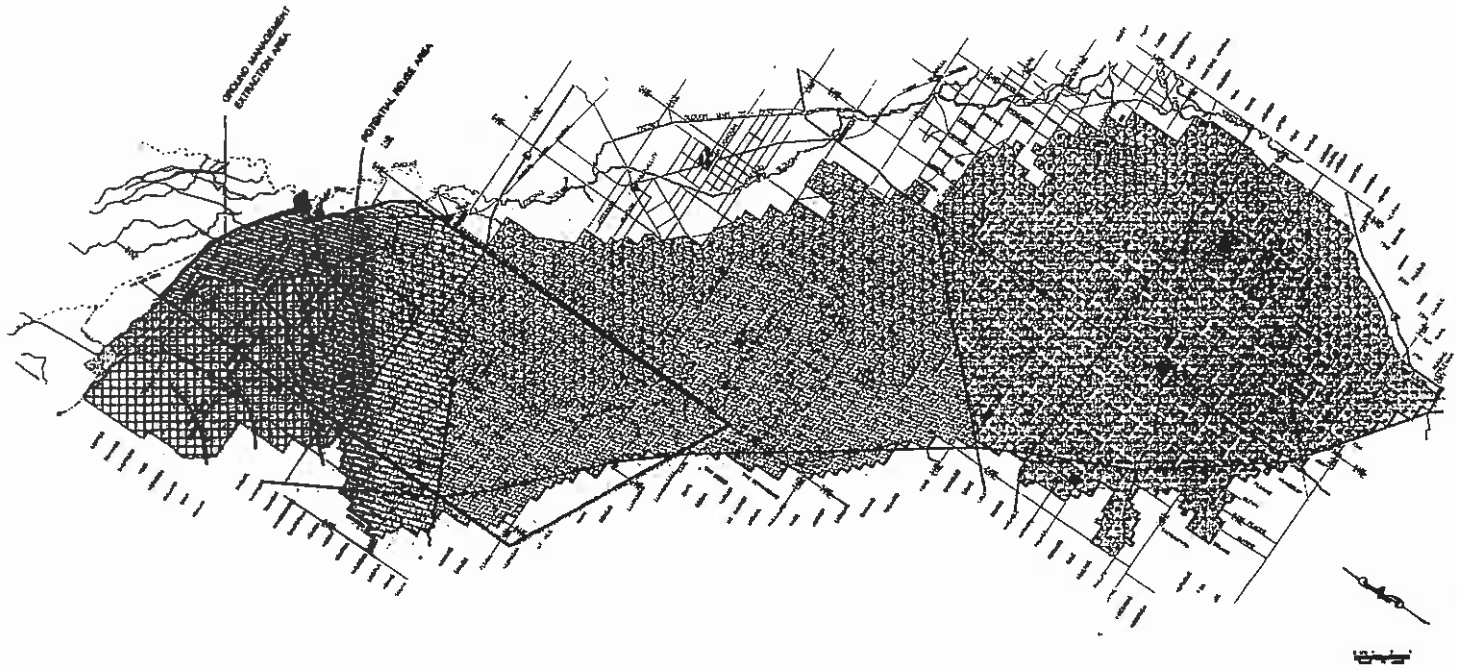
LOCATION OF CURRENT DRAINAGE MANAGEMENT ACTIVITIES



GRASSLAND DRAINAGE AREA
EXCHANGE CONTRACTORS SUB AREA
SAN LUIS UNIT SUB AREA
WESTLANDS DRAINAGE AREA
NORTHERN WESTLANDS DRAINAGE AREA
CENTRAL WESTLANDS DRAINAGE AREA
SOUTHERN WESTLANDS DRAINAGE AREA
GROUNDWATER MANAGEMENT PILOT WELLS
RECENTLY RETIRED LANDS
EXISTING SAN JOAQUIN RIVER WATER QUALITY IMPROVEMENT PROJECT
RECENTLY INSTALLED MULTI-COMPLETION MONITORING WELLS

EXHIBIT "B"

DRAINAGE MANAGEMENT PLAN (PHASE I)



GRASSLAND DRAINAGE AREA
EXCHANGE CONTRACTORS SUB AREA
SAN LUIS UNIT SUB AREA
WESTLANDS DRAINAGE AREA
NORTHERN WESTLANDS DRAINAGE AREA
CENTRAL WESTLANDS DRAINAGE AREA
SOUTHERN WESTLANDS DRAINAGE AREA
EXPANDED REUSE AREA
GROUND MANAGEMENT EXTRACTION AREA
POTENTIAL REUSE AREA

EXHIBIT "C"

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SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX L

Water Quality Monitoring Plan for the Delta Mendota Canal

RECLAMATION

Managing Water in the West

Delta-Mendota Canal
Non-Project Water Pump-in Program
Monitoring Plan

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
South-Central California Area Office

Revised: 20 Mar 2018

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Contents

Introduction

The overall supply of Central Valley Project (CVP) water has been reduced by drought and restrictions on pumping from the Sacramento-San Joaquin Delta. Under the Warren Act of 1911[1], U.S. Department of the Interior, Bureau of Reclamation (Reclamation) may execute temporary contracts to convey non-project water in excess capacity in federal irrigation canals.

Reclamation proposes to execute contracts with local water districts to convey non-project water in the Delta-Mendota Canal (DMC) subject to water quality monitoring, groundwater monitoring and reporting requirements outlined in this document.

This document describes the plan for measuring required monitoring data used to limit impacts of subsidence and water quality degradation in the DMC as it relates to this program. The monitoring data must be measured properly to demonstrate it is consistent, predictable, and of acceptable quality.

Reclamation will use these data for the administration of the current Warren Act contracts and environmental review for future contracts.

In addition this monitoring program, the following constraints also apply:

1) The DMC will be split into four zones:

DMC Zone	Milepost Range	DMC Features
1	0.0 to 24.43	Headworks to Check 4
2	24.44 to 70.01	Check 4 to Check 13
3	70.02 to 99.82	Check 13 to Telles Farm Bridge (SJRIP)
4	99.83 to 116.48	Telles Farm Bridge to terminus

2) Each zone will only be allowed to discharge non-project water when their CVP allocation is less than or equal to the following:

DMC Zone	CVP Allocation
1	50%
2	40%
3	45%
4	40%

3) Each zone will have a pumping limit based on the following CVP allocation ranges:

CVP Allocation	Pumping Limit
50%-41%	15,000 AFY
40%-21%	17,500 AFY
20%-0%	20,000 AFY

[1] Warren Act (Act of February 21, 1911, ch. 141, 36 Stat. 925)

Definitions

Non-Project Water means surface or ground water:

(1) Pumped, diverted, and/or stored based upon the exercise of water rights which have not been appropriated or acquired by, or apportioned to, the United States or others, or which have not been decreed, permitted, certificated, licensed, or otherwise granted to the United States or others, for a Reclamation project, or

(2) Water not reserved or withdrawn from appropriation by the United States for, nor allocated by the United States to, a Reclamation project.

Excess Capacity means diversion, storage, conveyance, or pumping capacity in project facilities which is excess to that needed to achieve a Reclamation project's authorized purposes.

Max Depth to Groundwater (Max DTGW) represents the maximum depth to groundwater measurement collected from an individual well.

Fall/Winter Median Groundwater Level represents the average historical recovery level for each well. Determined by using groundwater level data recorded in the Fall/Winter after the well has had time to recovery from irrigation season.

Background

The Delta Division of the federal CVP delivers water to almost a million acres of farmland in the San Joaquin Valley of California. The CVP is also the sole source of clean water for state and federal wildlife refuges and many private wetlands in Fresno, Merced, San Joaquin, and Stanislaus Counties.

The source of water for the Division is the northern Sierra Nevada, passing through the delta of the Sacramento and San Joaquin Rivers. This water is suitable in quality for irrigation and wetlands. The Central Valley is regularly affected by droughts that reduce the annual supply of water. Environmental regulations also restrict the operation of the Jones Pumping Plant to divert water from the Delta. The salinity of water in the Delta is highly variable due to the tidal intrusion of seawater and outflow of river water.

The DMC carries CVP water to farms, communities, and wetlands between Tracy and Mendota. The 116 mile canal was built by Reclamation in 1952 and is currently operated and maintained by the San Luis and Delta-Mendota Water Authority (Authority). Uncontrolled inflows of tailwater from uphill fields and subsurface water add contaminants to the canal. The addition of non-project water may further degrade the quality of water in the canal.

The districts in the Delta Division use surface and ground water to supplement their contractual supply from the CVP. These supplies are called "Non-Project Water" because they have not been appropriated by the United States for the purposes of the CVP.

The quality of the non-project water must be measured to confirm that there will be no harm to downstream water users when it is pumped into the canal. Reclamation has developed a set of standards for the non-project water based on the requirements of downstream water users. Routine testing will demonstrate that the non-project water is of consistent, predictable, and acceptable quality.

Monitoring Mission and Goals

The mission of this monitoring plan is to produce physical measurements that will determine the effects of non-project water pumping and conveyance in the DMC. The data will be used to implement the terms of the then current Warren Act Contracts and exchange agreements, and to ensure that the quality of CVP water is suitable for downstream water users.

The general goals of this monitoring plan are:

-monitor and evaluate groundwater level data,

-monitor and evaluate the baseline quality of CVP water in the DMC,

-monitor and evaluate the quality of water in each source of non-project water,

-identify changes in water quality related to the addition of the non-project water, and

-confirm the blend of CVP water and non-project water is suitable for downstream agricultural and wetlands use.

Study Area

The Study Area is the Delta-Mendota Canal from Tracy to the Mendota Pool. The canal is divided into two reaches in relation to the O'Neill Forebay and the connection to the State Water Project.

Water Quality Monitoring Plan

Water Quality Standards

The quality of each source of non-project water must meet the standards listed in **Tables 1 and 2.** The standards have been developed by Reclamation to measure constituents of concern that would affect downstream water users. In particular, the concentration of selenium in any pump-in water shall not exceed 2 µg/L, the limit for the Grasslands wetlands water supply channels specified in the 1998 Basin Plan.[2] The salinity of each source of pump-in water should not

[2] California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. Revised

exceed 1500 mg/L TDS. The other constituents are mainly agricultural chemicals listed in the California Drinking Water Standards (Title 22)[3]. We are also requiring measurements of boron and sodium that are not included in Title 22.

In addition, Reclamation has imposed both in-canal (**Table 6**) and discharge (**Tables 1 and 2**) boron and sodium thresholds. These thresholds are in place to project agricultural beneficial use of DMC water.

Real-time Monitoring

Reclamation will monitor the electrical conductivity (EC) of water in the DMC at the locations listed in **Table 3**. Reclamation is responsible for the management and maintenance of these real-time EC stations.

In-Canal Sampling

Based on available funding, Reclamation will collect monthly water samples from the DMC at the sites listed in **Table 4**.

The Authority will sample for boron and sodium at a minimum of four locations along the DMC. Two locations in the upper DMC (upstream of San Luis Reservoir), one upstream of non-project pumping and one downstream of non-project pumping. Two locations in the lower DMC (downstream of San Luis Reservoir), one upstream of non-project pumping and one downstream of non-project pumping.

Source Sampling

Prior to pumping into the DMC, the water in each source of non-project water must be tested for a short list of constituents of concern (**Table 1**). This initial test will economically screen out unacceptable water sources. Upon review of the short list laboratory results and written approval from Reclamation and the Authority, the non-project water may be discharged into the DMC. Non-project water sources discharging into the DMC are required to sample the short list of constituents every week for the first four weeks, followed by monthly sampling for the duration of pumping.

Every three years the non-project source is required to sample for the full suite of Title 22 (**Table 2**). Any source of non-project water with out-of-date analysis will not be allowed to discharge until laboratory data is updated.

Laboratory analysis for non-project source water is at the expense of the discharger. Reclamation has provided a list of approved laboratories (**Table 5**). These laboratories have passed an audit by Reclamation Mid-Pacific Region Quality Assurance Staff. Samples shall be collected using industry approved field methods. Laboratory reports must be sent to

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[3] California Code of Regulations, Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code (Sections 4010 4037), and Administrative Code (Sections 64401 et seq.), as amended.
http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dwregulations-2016-09-23.pdf

Reclamation and contain appropriate chain of custody and laboratory quality control information. The source of analysis must be clearly labeled on the laboratory report.

Maximum Allowable Concentrations

Reclamation will use real-time monitoring stations and in-canal water samples to monitor changes in the salinity, selenium, boron, and sodium levels in the DMC, and determine if non-project water has caused these changes. In-canal changes are limited to the concentrations listed in **Table 6**. Reclamation will direct the Authority stop pumping if concentrations exceed these limits.

Groundwater Level Monitoring Plan

Groundwater Level Monitoring

Groundwater levels in each non-project water well will be measured by the Authority once per month from March to September and every other month outside of that range. Measurements must be made using industry approved methods.

Groundwater Level Constraints

Groundwater level constraints are put in place to protect wells from pumping below their Max DTGW and further contribute to subsidence. Groundwater level data will be used for the following constraints:

-An individual well will be shutoff when its Depth to Groundwater reaches 75% of the difference between the Fall/Winter Median Groundwater Level and the Max DTGW using the following equation:

$$Shutoff = 0.75*(Max\ DTGW - Fall/Winter\ Median) + Fall/Winter\ Median$$

- If an individual well is shutoff due to groundwater levels reaching the shutoff trigger, it will not be allowed to resume pumping until it reaches 70% of the difference between the Fall/Winter Median Groundwater Level and the Max DTGW using the following equation:

$$Well\ Resumption = 0.70*(Max\ DTGW - Fall/Winter\ Median) + Fall/Winter\ Median$$

Groundwater level measurements will follow a strict schedule. If a well is shutoff it will not be measured again until the next scheduled measurement date. The Authority must notify Reclamation in writing when a well is shutoff or resuming. See Definitions section for explanation for Max DTGW and Fall/Winter Median.

Groundwater Data Requirements

Each well mush have static Max DTGW and Fall/Winter Median data established in order to participate in the program. Any well which is missing this data will be excluded from discharging

into the DMC until a groundwater level measurement can be recorded and a Fall/Winter Median depth to groundwater level can be developed.

Access

Reclamation or its designees will be allowed access to well heads and discharge locations for independent verification of water quality, groundwater level, and flow measurements.

Revision

Reclamation reserves the right to modify this monitoring program at any time to change.

Delta-Mendota Canal
Non-Project Water Pump-in Program
Water Quality Monitoring Plan

Table 1. Water Quality Standards, Short List

Constituent	Units	Maximum Contaminant Level		Detection Limit for Reporting		CAS Registry Number	Recommended Analytical Method
Arsenic	mg/L	0.01	(1)	0.002	(2)	7440-38-2	EPA 200.8
Boron	mg/L	2.0	(13)			7440-42-8	EPA 200.7
Nitrate (as nitrogen)	mg/L	10	(1)	0.4	(2)	7727-37-9	EPA 300.1
Selenium	mg/L	0.002	(10)	0.0004	(2)	7782-49-2	EPA 200.8
Sodium	mg/L	100	(12)			7440-23-5	EPA 200.7
Specific Conductance	µS/cm	2,200	(7)				SM 2510 B
Sulfate	mg/L	500	(7)			14808-79-8	EPA 300.1
Total Dissolved Solids	mg/L	1,500	(7)				SM 2540 C

Sources:
Recommended Analytical Methods: https://www.nemi.gov/home/
Maximum Contaminant Levels:
Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code (Sections 4010-4037), and Administrative Code (Sections 64401 et seq.), as amended.

(1) Title 22. Table 64431-A Maximum Contaminant Levels, Inorganic Chemicals

(2) Title 22. Table 64432-A Detection Limits for Reporting (DLRs) for Regulated Inorganic Chemicals

(3) Title 22. Table 64442 Radionuclide Maximum Contaminant Levels (MCLs) and Detection Levels for Purposes of Reporting (DLRs)

(4) Title 22. Table 64444-A Maximum Contaminate Levels, Organic Chemicals

(5) Title 22. Table 64445.1-A Detection Limits for Purposes of Reporting (DLRs) for Regulated Organic Chemicals

(6) Title 22. Table 64449-A Secondary Maximum Contaminant Levels "Consumer Acceptance Contaminant Levels"

(7) Title 22. Table 64449-B Secondary Maximum Contaminant Levels "Consumer Acceptance Contaminant Level Ranges"

(8) Title 22. Table 64678-A DLRs for Lead and Copper

(9) Title 22. Section 64678 (d) Lead Action level

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dwregulations-2017-12-29.pdf

California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins.

(10) Basin Plan, Table III-1 (ug/L) (selenium in Grasslands water supply channels)

(11) Basin Plan, Table III-2A (ug/L) (chlorpyrifos & diazinon in San Joaquin River from Mendota to Vernalis)

Sacramento & San Joaquin River Basin Plan 2009
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf

Ayers, R. S. and D. W. Westcot, *Water Quality for Agriculture* , Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).

(12) Ayers, Table 1 (mg/L) (sodium)

(13) Ayers, Table 21 (mg/L) (boron)

Water Quality Standards for Agriculture 1985
http://www.fao.org/DOCREP/003/T0234E/T0234E00.HTM

Delta-Mendota Canal
Non-Project Water Pump-in Program
Water Quality Monitoring Plan

Table 2. Water Quality Standards, Title 22

Constituent	Units	Maximum Contaminant Level		Detection Limit for Reporting		CAS Registry Number	Recommended Analytical Method
Primary							
Aluminum	mg/L	1	(1)	0.05	(2)	7429-90-5	EPA 200.7
Antimony	mg/L	0.006	(1)	0.006	(2)	7440-36-0	EPA 200.8
Arsenic	mg/L	0.010	(1)	0.002	(2)	7440-38-2	EPA 200.8
Asbestos	MFL	7	(1)	0.2 MFL>10um	(2)	1332-21-4	EPA 100.2
Barium	mg/L	1	(1)	0.1	(2)	7440-39-3	EPA 200.7
Beryllium	mg/L	0.004	(1)	0.001	(2)	7440-41-7	EPA 200.7
Cadmium	mg/L	0.005	(1)	0.001	(2)	7440-43-9	EPA 200.7
Chromium, total	mg/L	0.05	(1)	0.01	(2)	7440-47-3	EPA 200.7
Cyanide	mg/L	0.15	(1)	0.1	(2)	57-12-5	EPA 335.2
Fluoride	mg/L	2.0	(1)	0.1	(2)	16984-48-8	EPA 300.1
Mercury	mg/L	0.002	(1)	0.001	(2)	7439-97-6	EPA 245.1
Nickel	mg/L	0.1	(1)	0.01	(2)	7440-02-0	EPA 200.7
Nitrate (as nitrogen)	mg/L	10	(1)	0.4	(2)	7727-37-9	EPA 300.1
Nitrate + Nitrite (sum as nitrogen)	mg/L	10	(1)			14797-55-8	EPA 353.2
Nitrite (as nitrogen)	mg/L	1	(1)	0.4	(2)	14797-65-0	EPA 300.1
Perchlorate	mg/L	0.006	(1)	0.004	(2)	14797-73-0	EPA 314/331/332
Selenium	mg/L	0.002	(10)	0.0004		7782-49-2	EPA 200.8
Thallium	mg/L	0.002	(1)	0.001	(2)	7440-28-0	EPA 200.8
Secondary							
Aluminum	mg/L	0.2	(6)			7429-90-5	EPA 200.7
Color	units	15	(6)				EPA 110
Copper	mg/L	1.0	(6)	0.05	(8)	7440-50-8	EPA 200.7
Foaming Agents (MBAS)	mg/L	0.5	(6)				
Iron	mg/L	0.3	(6)			7439-89-6	EPA 200.7
Manganese	mg/L	0.05	(6)			7439-96-5	EPA 200.7
Methyl-tert-butyl ether (MTBE)	mg/L	0.013	(4)			1634-04-4	EPA 502.2/524.2
Odor -threshold	units	3	(6)				SM 2150B
Silver	mg/L	0.1	(6)			7440-22-4	EPA 200.7
Thiobencarb	mg/L	0.001	(6)			28249-77-6	EPA 527
Turbidity	units	5	(6)				EPA 190.1/SM2130B
Zinc	mg/L	5	(6)			7440-66-6	EPA 200.7
Total Dissolved Solids	mg/L	1,500	(7)				SM 2540 C
Specific Conductance	µS/cm	2,200	(7)				SM 2510 B
Chloride	mg/L	500	(7)			16887-00-6	EPA 300.1
Sulfate	mg/L	500	(7)			14808-79-8	EPA 300.1
Other Required Analyses							
Boron	mg/L	2.0	(13)			7440-42-8	EPA 200.7
Lead	mg/L	0.015	(8)	0.005	(8)	7439-92-1	EPA 200.8
Molybdenum	mg/L	0.01	(11)			7439-98-7	EPA 200.7
Sodium	mg/L	100	(12)			7440-23-5	EPA 200.7
Radioactivity							
Gross Alpha	pCi/L	15	(3)	3	(3)		SM 7110C

Delta-Mendota Canal
Non-Project Water Pump-in Program

Constituent	Units	Maximum Contaminant Level		Detection Limit for Reporting		CAS Registry Number	Recommended Analytical Method
Organic Chemicals							
(a) Volatile Organic Chemicals (VOCs)							
Benzene	mg/L	0.001	(4)	0.0005	(5)	71-43-2	EPA 502.2/524.2
Carbon Tetrachloride	mg/L	0.0005	(4)	0.0005	(5)	56-23-5	EPA 502.2/524.2
1,2-Dichlorobenzene	mg/L	0.6	(4)	0.0005	(5)	95-50-1	EPA 502.2/524.2
1,4-Dichlorobenzene	mg/L	0.005	(4)	0.0005	(5)	106-46-7	EPA 502.2/524.2
1,1-Dichloroethane	mg/L	0.005	(4)	0.0005	(5)	75-34-3	EPA 502.2/524.2
1,2-Dichloroethane	mg/L	0.0005	(4)	0.0005	(5)	107-06-2	EPA 502.2/524.2
1,1-Dichloroethylene	mg/L	0.006	(4)	0.0005	(5)	75-35-4	EPA 502.2/524.2
cis-1,2-Dichloroethylene	mg/L	0.006	(4)	0.0005	(5)	156-59-2	EPA 502.2/524.2
trans-1,2-Dichloroethylene	mg/L	0.01	(4)	0.0005	(5)	156-60-5	EPA 502.2/524.2
Dichloromethane.	mg/L	0.005	(4)	0.0005	(5)	75-09-2	EPA 502.2/524.2
1,2-Dichloropropane.	mg/L	0.005	(4)	0.0005	(5)	78-87-5	EPA 502.2/524.2
1,3-Dichloropropene.	mg/L	0.0005	(4)	0.0005	(5)	542-75-6	EPA 502.2/524.2
Ethylbenzene.	mg/L	0.3	(4)	0.0005	(5)	100-41-4	EPA 502.2/524.2
Methyl-tert-butyl ether	mg/L	0.013	(4)	0.003	(5)	1634-04-4	EPA 502.2/524.2
Monochlorobenzene	mg/L	0.07	(4)	0.0005	(5)	108-90-7	EPA 502.2/524.2
Styrene.	mg/L	0.1	(4)	0.0005	(5)	100-42-5	EPA 502.2/524.2
1,1,2,2-Tetrachloroethane.	mg/L	0.001	(4)	0.0005	(5)	79-34-5	EPA 502.2/524.2
Tetrachloroethylene (PCE)	mg/L	0.005	(4)	0.0005	(5)	127-18-4	EPA 502.2/524.2
Toluene	mg/L	0.15	(4)	0.0005	(5)	108-88-3	EPA 502.2/524.2
1,2,4-Trichlorobenzene	mg/L	0.005	(4)	0.0005	(5)	120-82-1	EPA 502.2/524.2
1,1,1-Trichloroethane	mg/L	0.200	(4)	0.0005	(5)	71-55-6	EPA 502.2/524.2
1,1,2-Trichloroethane	mg/L	0.005	(4)	0.0005	(5)	79-00-5	EPA 502.2/524.2
Trichloroethylene	mg/L	0.005	(4)	0.0005	(5)	79-01-6	EPA 502.2/524.2
Trichlorofluoromethane	mg/L	0.15	(4)	0.005	(5)	75-69-4	EPA 502.2/524.2
1,1,2-Trichloro-1,2,2-Trifluoroethane.	mg/L	1.2	(4)	0.01	(5)	76-13-1	SM 6200B
Vinyl Chloride	mg/L	0.0005	(4)	0.0005	(5)	75-01-4	EPA 502.2/524.2
Xylenes	mg/L	1.750	(4)	0.0005	(5)	1330-20-7	EPA 502.2/524.2
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)							
Alachlor	mg/L	0.002	(4)	0.001	(5)	15972-60-8	EPA 505/507/508
Atrazine	mg/L	0.001	(4)	0.0005	(5)	1912-24-9	EPA 505/507/508
Bentazon	mg/L	0.018	(4)	0.002	(5)	25057-89-0	EPA 515.1
Benzo(a)pyrene	mg/L	0.0002	(4)	0.0001	(5)	50-32-8	EPA 525.2
Carbofuran	mg/L	0.018	(4)	0.005	(5)	1563-66-2	EPA 531.1
Chlordane	mg/L	0.0001	(4)	0.0001	(5)	57-74-9	EPA 505/508
2,4-D	mg/L	0.07	(4)	0.01	(5)	94-75-7	EPA 515.1
Dalapon	mg/L	0.2	(4)	0.01	(5)	75-99-0	EPA 515.1
Dibromochloropropane	mg/L	0.0002	(4)	0.00001	(5)	96-12-8	EPA 502.2/504.1
Di(2-ethylhexyl)adipate	mg/L	0.4	(4)	0.005	(5)	103-23-1	EPA 506
Di(2-ethylhexyl)phthalate	mg/L	0.004	(4)	0.003	(5)	117-81-7	EPA 506
Dinoseb	mg/L	0.007	(4)	0.002	(5)	88-85-7	EPA 5151-4
Diquat	mg/L	0.02	(4)	0.004	(5)	85-00-7	EPA 549.2
Endothall	mg/L	0.1	(4)	0.045	(5)	145-73-3	EPA 548.1
Endrin.	mg/L	0.002	(4)	0.0001	(5)	72-20-8	EPA 505/508
Ethylene Dibromide	mg/L	0.00005	(4)	0.00002	(5)	106-93-4	EPA 502.2/504.1
Glyphosate	mg/L	0.7	(4)	0.025	(5)	1071-83-6	EPA 547
Heptachlor.	mg/L	0.00001	(4)	0.00001	(5)	76-44-8	EPA 508
Heptachlor Epoxide	mg/L	0.00001	(4)	0.00001	(5)	1024-57-3	EPA 508
Hexachlorobenzene	mg/L	0.001	(4)	0.0005	(5)	118-74-1	EPA 505/508
Hexachlorocyclopentadiene	mg/L	0.05	(4)	0.001	(5)	77-47-4	EPA 505/508
Lindane (gamma-BHC)	mg/L	0.0002	(4)	0.0002	(5)	58-89-9	EPA 505/508
Methoxychlor	mg/L	0.03	(4)	0.01	(5)	72-43-5	EPA 505/508

Delta-Mendota Canal
Non-Project Water Pump-in Program

Constituent	Units	Maximum Contaminant Level		Detection Limit for Reporting		CAS Registry Number	Recommended Analytical Method
Molinate	mg/L	0.02	(4)	0.002	(5)	2212-67-1	EPA 525.1
Oxamyl	mg/L	0.05	(4)	0.02	(5)	23135-22-0	EPA 531.1
Pentachlorophenol	mg/L	0.001	(4)	0.0001	(5)	87-86-5	EPA 515.1-3
Picloram	mg/L	0.5	(4)	0.001	(5)	1918-02-1	EPA 515.1-3
Polychlorinated Biphenyls	mg/L	0.0005	(4)	0.0005	(5)	1336-36-3	EPA 130.1
Simazine	mg/L	0.004	(4)	0.001	(5)	122-34-9	EPA 505
Thiobencarb (Bolero)	mg/L	0.07	(4)	0.001	(5)	28249-77-6	EPA 527
Toxaphene	mg/L	0.003	(4)	0.001	(5)	8001-35-2	EPA 505
1,2,3-Trichloropropane	mg/L	0.000005	(4)	0.000005	(5)	96-18-4	EPA 524.3
2,3,7,8-TCDD (Dioxin)	mg/L	3 x 10-8	(4)	5 x 10-9	(5)	1746-01-6	EPA 130.3
2,4,5-TP (Silvex)	mg/L	0.05	(4)	0.001	(5)	93-72-1	EPA 515.1
Other Organic Chemicals							
Chlorpyrifos	ug/L	0.015	(11)			2921-88-2	EPA 8141A
Diazinon	ug/L	0.10	(11)			333-41-5	EPA 8141A

Sources:
Recommended Analytical Methods: https://www.nemi.gov/home/
Maximum Contaminant Levels:

Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code (Sections 4010-4037), and Administrative Code (Sections 64401 et seq.), as amended.

(1) Title 22. Table 64431-A Maximum Contaminant Levels, Inorganic Chemicals

(2) Title 22. Table 64432-A Detection Limits for Reporting (DLRs) for Regulated Inorganic Chemicals

(3) Title 22. Table 64442 Radionuclide Maximum Contaminant Levels (MCLs) and Detection Levels for Purposes of Reporting (DLRs)

(4) Title 22. Table 64444-A Maximum Contaminate Levels, Organic Chemicals

(5) Title 22. Table 64445.1-A Detection Limits for Purposes of Reporting (DLRs) for Regulated Organic Chemicals

(6) Title 22. Table 64449-A Secondary Maximum Contaminant Levels "Consumer Acceptance Contaminant Levels"

(7) Title 22. Table 64449-B Secondary Maximum Contaminant Levels "Consumer Acceptance Contaminant Level Ranges"

(8) Title 22. Table 64678-A DLRs for Lead and Copper

(9) Title 22. Section 64678 (d) Lead Action level

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dwregulations-2017-12-29.pdf

California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. Revised June 2015

(10) Basin Plan, Table III-1 (ug/L) (selenium in Grasslands water supply channels)

(11) Basin Plan, Table III-2A. 4-day average (chronic) concentrations of chlorpyrifos & diazinon in San Joaquin River from Mendota to Vernalis

http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf

Ayers, R. S. and D. W. Westcot, *Water Quality for Agriculture* , Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).

(12) Ayers, Table 1 (mg/L) (sodium)

(13) Ayers, Table 21 (mg/L) (boron)

http://www.fao.org/DOCREP/003/T0234E/T0234E00.HTM

Delta-Mendota Canal
Non-Project Surface Water Pump-in Program
Water Quality Monitoring Plan

Table 3. Reclamation Real-time Salinity Monitoring Stations

DMC Milepost	San Joaquin River Mile	Location	Operating Agency	CDEC
3.46		Jones Pumping Plant	CVO	DMC
70.01		DMC Check 13	CVO	ONI
111.26		DMC Check 20	CVO	DM2
116.48	204.2	DMC Check 21	CVO	DM3

Key:
CDEC: California Data Exchange Center
CVO: Central Valley Operations Office

Delta-Mendota Canal
Non-Project Surface Water Pump-in Program
Water Quality Monitoring Plan

Table 4. Reclamation Water Quality Monitoring Stations

DMC Milepost	River Mile	Location	Operating Agency	Parameters	Frequency/ method	CDEC
3.46		Top of siphon above Jones Pumping Plant	Reclamation	EC, selenium	Daily composite	
63.98		Check 12	Reclamation	Title 22	Monthly grab	
70.01		Check 13 O'Neill Forebay	CVO	EC, selenium	Daily composite	ONI
97.68		DMC at Russell Ave	Reclamation	EC, selenium, boron	Monthly grab	
100.85		DMC at Telles Farm Bridge	Reclamation	EC, selenium, boron	Monthly grab	
110.12		DMC at Washoe Ave	Reclamation	EC, selenium, boron	Monthly grab	
111.26		DMC Check 20	CVO	EC	Real-time	DM2
116.48	204.2	DMC Check 21	CVO	EC, selenium	Daily composite	DM3

Key:
CVO: Central Valley Operations Office
EC: Electrical conductivity
Reclamation: MP-157 Environmental Monitoring Branch

RECLAMATION
Managing Water in the West

Table 5. Approved Laboratory List for the Mid-Pacific Region Quality Assurance and Data Management Branch (MP-156) and Environmental Monitoring and Hazardous Materials Branch (MP-157)

APPL Laboratory	**Address**	908 North Temperance Avenue, Clovis, CA 93611
	Contact	Renee' Patterson, Project Manager
	P/F	(559) 275-2175 / (559) 275-4422
	Email	rpatterson@applinc.com; danderson@applinc.com;
	Methods	*Approved for inorganic and organic parameters in water and soil*
Basic Laboratory	**Address**	2218 Railroad Avenue Redding, CA 96001 USA
	Contact	Josh Kirkpatrick, Nathan Hawley, Melissa Hawley
	P/F	(530) 243-7234 / (530) 243-7494
	Email	jkirkpatrick@basiclab.com (QAO and PM); nhawley@basiclab.com, mhawley@basiclab.com (invoices); poilar@basiclab.com (sample custody), khawley@basiclab.com (sample custody)
	Methods	*Approved for inorganic/organic parameters*
California Laboratory Services	**Address**	3249 Fitzgerald Road Rancho Cordova, CA 95742
	Contact	Scott Furnas
	P/F	(916) 638-7301 / (916) 638-4510
	Email	janetm@californialab.com (QA); scottf@californialab.com (PM)
	Methods	*Approved for inorganic, organic, and microbiological parameters*
Calscience Environmental Laboratories	**Address**	7440 Lincoln Way; Garden Grove, CA 92841
	Contact	Don Burley
	P/F	714-895-5494 (ext. 203)/714-894-7501
	Email	DBurley@calscience.com
	Methods	*Approved for inorganic and organic parameters in water, sediment, and soil.*
Caltest Analytical Laboratory	**Address**	1885 N. Kelly Rd. Napa, CA 94558
	Contact	Mike Hamilton, Patrick Ingram (Lab Director)
	P/F	(707) 258-4000/(707) 226-1001
	Email	Mike_Hamilton@caltestlabs.com; Patrick_Ingram@caltestlabs.com info@caltestlabs.com
	Methods	*Approved for inorganic and microbiological parameters*
Eurofins Eaton Analytical, Inc. (formerly MWH Laboratories)	**Address**	750 Royal Oaks Drive Ste. 100 Monrovia, CA 91016 USA
	Contact	Linda Geddes (Project Manager), Rick Zimmer (quotes)
	P/F	(626) 386-1100, Linda - (626) 386-1163, Rick - (626) 386-1157
	Email	lindageddes@eurofinsus.com
	Methods	*Approved for all inorganic, organic, and radiochemistry parameters in water*
Fruit Growers Laboratory	**Address**	853 Corporation Street Santa Paula, CA 93060 USA
	Contact	David Terz, QA Director
	P/F	(805) 392-2024 / (805) 525-4172
	Email	davidt@fglinc.com

RECLAMATION
Managing Water in the West

Table 5. Approved Laboratory List for the Mid-Pacific Region Quality Assurance and Data Management Branch (MP-156) and Environmental Monitoring and Hazardous Materials Branch (MP-157)

	Methods	*Approved for general physical analysis in soils and most inorganic and organic parameters in water and soil; not approved for mercury in water or silver in soil.*
Sierra Foothill Laboratory, Inc.	**Address**	255 Scottsville Blvd, Jackson, CA 95642
	Contact	Sandy Nurse (Owner) or Karen Lantz (Program Manager)
	P/F	(209) 223-2800 / (209) 223-2747
	Email	sandy@sierrafoothilllab.com, CC: dale@sierrafoothilllab.com
	Methods	*Approved for all inorganic parameters (except low level TKN), microbiological parameters, acute and chronic toxicity.*
South Dakota Agricultural Laboratories	**Address**	Brookings Biospace, 1006 32nd Avenue, Suites 103,105, Brookings, SD 57006-4728
	Contact	Regina Wixon, Jessie Davis, Steven Hauger (sample custodian)
	P/F	(605) 692-7325/(605) 692-7326
	Email	regina.wixon@sdaglabs.com, annie.mouw@sdaglabs.com, emily.weissenfluh@sdaglabs.com, darin.wixon@sdaglabs.com
	Methods	*Approved for selenium analysis*
TestAmerica	**Address**	880 Riverside Parkway West Sacramento, CA 95605 USA
	Contact	Linda Laver
	P/F	(916) 374-4362 / (916) 372-1059 fax
	Email	Linda.Laver@TestAmericaInc.com
	Methods	*Approved for all inorganic parameters and hazardous waste organics. Ag analysis in sediment, when known quantity is present, request 6010B*
Western Environmental Testing Laboratories	**Address**	475 East Greg Street # 119 Sparks, NV 89431 USA
	Contact	Kurt Clarkson/Logan Greenwood (Client Services), Andy Smith (Lab Director)
	P/F	(775) 355-0202 / (775) 355-0817
	Email	kurtc@wetlaboratory.com, logang@wetlaboratory.com, andy@wetlaboratory.com
	Methods	*Approved for inorganic parameters (metals, general chemistry) and coliforms.*

Delta-Mendota Canal
Non-Project Surface Water Pump-in Program
Water Quality Monitoring Plan

Table 6. Parameters for Accepting Non-Project Surface Water in the Upper DMC

Parameter	Values in the DMC
Recommended flow passing Headworks and Check 13	More than 500 cfs
Change in EC attributable to the addition of non-project water	Less than 100 µS/cm
Increase in Selenium attributable to the addition of non-project water	Less than 1 µg/L
In-canal boron	0.7 mg/L
In-canal sodium	1 meq/L above baseline*

* baseline measured near DMC headworks for upper DMC and just downstream of San Luis Reservoir for lower DMC

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX M

Sample Water Quality Results from Wells Pumping Into the Delta Mendota Canal

MOORE TWINING ASSOCIATES, INC.
EST. 1998
California ELAP Certificate #1371

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

San Luis Water District	Project: Analytical Services	
1015 6th Street	Project Number: Analytical Services	**Reported:**
Los Banos CA, 93635	Project Manager: Janet Gutierrez, Watermaster	04/22/08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Well Site, Gravel Pit Rd.	8D07026-01	Ground Water	04/07/08 11:00	04/07/08 17:20
Well Site, Gravel Pit Rd.	8D07026-02	Ground Water	04/08/08 11:30	04/07/08 17:20

MOORE TWINING ASSOCIATES, INC.
California ELAP Certificate #1371

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

San Luis Water District	Project: Analytical Services	
1015 6th Street	Project Number: Analytical Services	**Reported:**
Los Banos CA, 93635	Project Manager: Janet Gutierrez, Watermaster	04/22/08

Well Site, Gravel Pit Rd.

8D07026-01 (Ground Water) Sampled:04/07/08 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes.
Semi-Volatile Organics									
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.010	µg/L	1	T8D1101	04/11/08	04/11/08	EPA 504.1	
1,2,3-Trichloropropane (123TCP)	ND	0.0050	µg/L	1	T8D1101	04/11/08	04/11/08	EPA 504.1	
1,2-Dibromoethane (EDB)	ND	0.020	µg/L	1	T8D1101	04/11/08	04/11/08	EPA 504.1	
Alachlor	ND	1.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Atrazine	ND	0.50	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Bromacil	ND	10	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Butachlor	ND	0.38	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Diazinon	ND	0.25	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Dimethoate	ND	10	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
EPTC	ND	2.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Metolachlor	ND	1.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Metribuzin	ND	2.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Molinate	ND	2.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Prometon	ND	0.050	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Prometryn	ND	2.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Propachlor	ND	0.050	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Simazine	ND	1.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Terbacil	ND	2.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Thiobencarb	ND	1.0	µg/L	1	T8D1203	04/11/08	04/12/08	EPA 507	
Surrogate: 1,3-Dimethyl-2-nitrobenzene		*94.6 %*	*0-200*		*T8D1203*	*04/11/08*	*04/12/08*	*EPA 507*	
Aldrin	ND	0.075	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Chlordane (tech)	ND	0.10	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Chlorothalonil	ND	5.0	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Dieldrin	ND	0.020	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Endrin	ND	0.10	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
gamma-BHC (Lindane)	ND	0.20	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Heptachlor	ND	0.010	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Heptachlor epoxide	ND	0.010	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Hexachlorobenzene	ND	0.50	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Methoxychlor	ND	10	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Polychlorinated biphenyls	ND	0.50	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Propachlor	ND	0.50	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Toxaphene	ND	1.0	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	

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San Luis Water District	Project: Analytical Services	
1015 6th Street	Project Number: Analytical Services	**Reported:**
Los Banos CA, 93635	Project Manager: Janet Gutierrez, Watermaster	04/22/08

Well Site, Gravel Pit Rd.

8D07026-01 (Ground Water) Sampled:04/07/08 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Semi-Volatile Organics									
Trifluralin	ND	0.50	µg/L	1	T8D1204	04/11/08	04/13/08	EPA 508	
Surrogate: PCNB		*98.2 %*	*0-200*		*T8D1204*	*04/11/08*	*04/13/08*	*EPA 508*	
2,4,5-TP (Silvex)	ND	1.0	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
2,4-D	ND	10	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
Bentazon	ND	2.0	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
Dalapon	ND	10	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
Dicamba	ND	1.5	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
Dichloroprop	ND	2.0	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
Dinoseb	ND	2.0	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
Pentachlorophenol	ND	0.20	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
Picloram	ND	1.0	µg/L	1	T8D1205	04/10/08	04/13/08	EPA 515.1	
Surrogate: 2,4-Dichlorophenylacetic acid		*96.7 %*	*58-130*		*T8D1205*	*04/10/08*	*04/13/08*	*EPA 515.1*	
3-Hydroxycarbofuran	ND	3.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Aldicarb	ND	3.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Aldicarb sulfone	ND	4.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Aldicarb sulfoxide	ND	3.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Carbaryl	ND	5.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Carbofuran	ND	5.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Methiocarb	ND	5.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Methomyl	ND	2.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Oxamyl	ND	20	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Propoxur	ND	5.0	µg/L	1	T8D1001	04/10/08	04/14/08	EPA 531.1	
Glyphosate	ND	25	µg/L	1	T8D1802	04/18/08	04/18/08	EPA 547	
Atrazine	ND	0.50	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Azinphos-methyl	ND	25	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Trifluralin	ND	0.050	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Bolstar	ND	1.2	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Chlorpyrifos	ND	1.0	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Coumaphos	ND	5.0	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Demeton-o	ND	1.2	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Demeton-s	ND	1.2	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Diazinon	ND	0.25	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Dimethoate	ND	1.2	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	

MOORE TWINING ASSOCIATES, INC.
California ELAP Certificate #1371

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

San Luis Water District	Project: Analytical Services	
1015 6th Street	Project Number: Analytical Services	**Reported:**
Los Banos CA, 93635	Project Manager: Janet Gutierrez, Watermaster	04/22/08

Well Site, Gravel Pit Rd.

8D07026-01 (Ground Water) Sampled:04/07/08 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes.
Semi-Volatile Organics									
Disulfoton	ND	0.50	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Ethion	ND	0.50	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Ethoprop	ND	0.50	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Fensulfothion	ND	2.5	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Fenthion	ND	1.2	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Malathion	ND	1.2	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Naled	ND	25	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Parathion-ethyl	ND	1.2	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Parathion-methyl	ND	2.5	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Phorate	ND	0.50	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Phosdrin	ND	2.5	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Ronnel	ND	2.5	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Simazine	ND	1.0	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Stirophos	ND	5.0	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Thionazin	ND	5.0	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Trichloronate	ND	1.2	µg/L	1	T8D1108	04/10/08	04/12/08	EPA 8141A	
Surrogate: Triphenyl phosphate		*78.0 %*	*70-140*		*T8D1108*	*04/10/08*	*04/12/08*	*EPA 8141A*	

MOORE TWINING ASSOCIATES, INC.
California ELAP Certificate #1371

2527 Fresno Street
Fresno, CA 93721
(559) 268-7021 Phone
(559) 268-0740 Fax

San Luis Water District	Project: Analytical Services	
1015 6th Street	Project Number: Analytical Services	**Reported:**
Los Banos CA, 93635	Project Manager: Janet Gutierrez, Watermaster	04/22/08

Well Site, Gravel Pit Rd.

8D07026-02 (Ground Water) Sampled:04/08/08 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes.
Inorganics									
Chloride	**67**	6.0	mg/L	3	T8D0902	04/09/08	04/09/08	EPA 300.0	
Specific Conductance (EC)	**1100**	1.0	µS/cm	1	T8D0912	04/09/08	04/09/08	EPA 120.1	
Nitrate as NO3	**31**	6.0	mg/L	3	T8D0902	04/09/08	04/09/08	EPA 300.0	
Sulfate as SO4	**200**	10	mg/L	5	T8D1002	04/10/08	04/10/08	EPA 300.0	
Total Dissolved Solids	**710**	13	mg/L	1.33	T8D1110	04/11/08	04/14/08	EPA 160.1	
Metals									
Aluminum	ND	4.0	µg/L	1	T8D1305	04/13/08	04/16/08	EPA 200.8	
Antimony	ND	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Arsenic	ND	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Barium	**50**	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Beryllium	ND	1.0	µg/L	1	T8D1305	04/13/08	04/16/08	EPA 200.8	
Boron	**0.36**	0.050	mg/L	1	T8D1113	04/11/08	04/11/08	EPA 200.7	
Cadmium	ND	0.20	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Chromium	**1.4**	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Copper	ND	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Iron	ND	20	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Lead	ND	0.50	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Manganese	**1.2**	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Mercury	ND	0.10	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Molybdenum	**1.5**	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Nickel	**2.1**	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Silver	ND	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Sodium	**73**	1.0	mg/L	1	T8D1113	04/11/08	04/11/08	EPA 200.7	
Thallium	ND	1.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	
Zinc	**6.6**	5.0	µg/L	1	T8D1305	04/13/08	04/15/08	EPA 200.8	

Notes and Definitions

TW	Tap water used for batch QC MS/MSD analyses.
ug/L	micrograms per liter (parts per billion concentration units)
mg/kg	milligrams per kilogram (parts per million concentration units)
mg/L	milligrams per Liter (parts per million concentration units)
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference

BSK Analytical Laboratories
Engineers & Laboratories

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Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Janet Gutierrez
San Luis Water District
PO Box 2135
Los Banos, CA 93635

BSK Submission #: 2008071140
BSK Sample ID #: 1009996

Report Issue Date: 08/12/2008

Project ID: Project Desc:

Submission Comments:
Sample Type: Liquid
Sample Description: 79.13R
Sample Comments:

Date Sampled: 07/14/2008
Time Sampled: 1000
Date Received: 07/15/2008

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Aggressive Index		**13**	-		1	N/A	07/30/08	07/30/08
Alkalinity (as CaCO3)	SM 2320 B	**180**	mg/L	3.0	1	3.0	07/15/08	07/15/08
Aluminum (Al)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Antimony (Sb)	EPA 200.8	**ND**	µg/L	2	1	2	07/16/08	07/24/08
Arsenic (As)	EPA 200.8	**6.6**	µg/L	2	1	2	07/16/08	07/24/08
Barium (Ba)	EPA 200.7	**0.20**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Beryllium (Be)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Bicarbonate (as CaCO3)	SM 2320 B	**180**	mg/L	3.0	1	3.0	07/15/08	07/15/08
Boron (B)	EPA 200.7	**0.82**	mg/L	0.10	1	0.10	07/16/08	07/22/08
Cadmium (Cd)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Calcium (Ca)	EPA 200.7	**97**	mg/L	0.10	1	0.10	07/16/08	07/22/08
Carbonate (as CaCO3)	SM 2320 B	**ND**	mg/L	1.0	1	1.0	07/15/08	07/15/08
Chloride (Cl)	EPA 300.0	**270**	mg/L	1.0	3	3.0	07/15/08	07/15/08
Chromium - Total (Cr)	EPA 200.8	**ND**	µg/L	10	1	10	07/16/08	07/24/08
Conductivity - Specific (EC) @25°C	SM 2510 B	**1300**	µmho/cm	1.0	1	1.0	07/15/08	07/15/08
Copper (Cu)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Cyanide (CN)	SM 4500-CN-F	**ND**	µg/L	20	1	20	07/25/08	07/25/08
Fluoride	EPA 300.0	**0.24**	mg/L	0.10	1	0.10	07/18/08	07/18/08
Hardness (as CaCO3)	SM 2340 B	**450**	mg/L	1.0	1	1.0	07/30/08	07/30/08
Hydroxide (as CaCO3)	SM 2320 B	**ND**	mg/L	1.0	1	1.0	07/15/08	07/15/08
Iron (Fe)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Langelier Index (Saturation Index)	SM 2330 B	**1.1**	-	-	1	N/A	07/30/08	07/30/08
Lead (Pb)	EPA 200.8	**ND**	µg/L	5.0	1	5.0	07/16/08	07/24/08
Magnesium (Mg)	EPA 200.7	**51**	mg/L	0.10	1	0.10	07/16/08	07/22/08
Manganese (Mn)	EPA 200.7	**ND**	mg/L	0.010	1	0.010	07/16/08	07/22/08
MBAS, Calculated as LAS, mol wt 340	SM 5540 C	**ND**	mg/L	0.050	1	0.050	07/16/08 07:20	07/16/08 07:20
Mercury (Hg)	EPA 200.8	**ND**	µg/L	0.40	1	0.40	07/16/08	07/24/08
Nickel (Ni)	EPA 200.8	**ND**	µg/L	10	1	10	07/16/08	07/24/08
Nitrate (NO3)	EPA 300.0	**17**	mg/L	1.0	3	3.0	07/15/08 19:20	07/15/08 19:20
Nitrite (NO2-N)	EPA 300.0	**ND**	mg/L	0.050	3	0.15	07/15/08 19:20	07/15/08 19:20

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.
MDC: Min Detectable Concentration

Report Authentication Code:

BSK Analytical Laboratories
Engineers & Laboratories

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Fax (559) 485-6935

Amended Page

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Janet Gutierrez
San Luis Water District
PO Box 2135
Los Banos, CA 93635

BSK Submission #: 2008071140
BSK Sample ID #: 1009996

Report Issue Date: 08/12/2008

Project ID:
Project Desc:
Submission Comments:
Sample Type: Liquid
Sample Description: 79.13R
Sample Comments:

Date Sampled: 07/14/2008
Time Sampled: 1000
Date Received: 07/15/2008

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Percent Sodium	EPA 200.7	**30**	%	-	1	N/A	08/07/08	08/07/08
pH at 22.72°C	SM 4500-H+ B	**8.1**	Std. Unit	-	1	N/A	07/15/08 19:33	07/15/08 19:33
Potassium (K)	EPA 200.7	**3.2**	mg/L	2	1	2.0	07/16/08	07/22/08
Selenium (Se) - Total	EPA 200.8	**11**	µg/L	2	1	2.0	07/16/08	07/25/08
Silver (Ag)	EPA 200.7	**ND**	mg/L	0.010	1	0.010	07/16/08	07/22/08
Sodium (Na)	EPA 200.7	**89**	mg/L	1.0	1	1.0	07/16/08	07/22/08
Sulfate (SO4)	EPA 300.0	**66**	mg/L	2	3	6.0	07/15/08	07/15/08
Thallium (Tl)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Total Dissolved Solids (TDS)	SM 2540 C	**760**	mg/L	5.0	1	5.0	07/15/08	07/17/08
Zinc (Zn)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
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Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Janet Gutierrez
San Luis Water District
PO Box 2135
Los Banos, CA 93635

BSK Submission #: 2008071140
BSK Sample ID #: 1009996

Report Issue Date: 07/30/2008

Project ID: Project Desc:
Submission Comments:
Sample Type: Liquid
Sample Description: 79.13R
Sample Comments:

Date Sampled: 07/14/2008
Time Sampled: 1000
Date Received: 07/15/2008

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Aggressive Index		**13**	-		1	N/A	07/30/08	07/30/08
Alkalinity (as CaCO3)	SM 2320 B	**180**	mg/L	3.0	1	3.0	07/15/08	07/15/08
Aluminum (Al)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Antimony (Sb)	EPA 200.8	**ND**	µg/L	2	1	2	07/16/08	07/24/08
Arsenic (As)	EPA 200.8	**6.6**	µg/L	2	1	2	07/16/08	07/24/08
Barium (Ba)	EPA 200.7	**0.20**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Beryllium (Be)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Bicarbonate (as CaCO3)	SM 2320 B	**180**	mg/L	3.0	1	3.0	07/15/08	07/15/08
Cadmium (Cd)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Calcium (Ca)	EPA 200.7	**97**	mg/L	0.10	1	0.10	07/16/08	07/22/08
Carbonate (as CaCO3)	SM 2320 B	**ND**	mg/L	1.0	1	1.0	07/15/08	07/15/08
Chloride (Cl)	EPA 300.0	**270**	mg/L	1.0	3	3.0	07/15/08	07/15/08
Chromium - Total (Cr)	EPA 200.8	**ND**	µg/L	10	1	10	07/16/08	07/24/08
Conductivity - Specific (EC) @25°C	SM 2510 B	**1300**	µmho/cm	1.0	1	1.0	07/15/08	07/15/08
Copper (Cu)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Cyanide (CN)	SM 4500-CN-F	**ND**	µg/L	20	1	20	07/25/08	07/25/08
Fluoride	EPA 300.0	**0.24**	mg/L	0.10	1	0.10	07/18/08	07/18/08
Hardness (as CaCO3)	SM 2340 B	**450**	mg/L	1.0	1	1.0	07/30/08	07/30/08
Hydroxide (as CaCO3)	SM 2320 B	**ND**	mg/L	1.0	1	1.0	07/15/08	07/15/08
Iron (Fe)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Langelier Index (Saturation Index)	SM 2330 B	**1.1**	-	-	1	N/A	07/30/08	07/30/08
Lead (Pb)	EPA 200.8	**ND**	µg/L	5.0	1	5.0	07/16/08	07/24/08
Magnesium (Mg)	EPA 200.7	**51**	mg/L	0.10	1	0.10	07/16/08	07/22/08
Manganese (Mn)	EPA 200.7	**ND**	mg/L	0.010	1	0.010	07/16/08	07/22/08
MBAS, Calculated as LAS, mol wt 340	SM 5540 C	**ND**	mg/L	0.050	1	0.050	07/16/08 07:20	07/16/08 07:20
Mercury (Hg)	EPA 200.8	**ND**	µg/L	0.40	1	0.40	07/16/08	07/24/08
Nickel (Ni)	EPA 200.8	**ND**	µg/L	10	1	10	07/16/08	07/24/08
Nitrate (NO3)	EPA 300.0	**17**	mg/L	1.0	3	3.0	07/15/08 19:20	07/15/08 19:20
Nitrite (NO2-N)	EPA 300.0	**ND**	mg/L	0.050	3	0.15	07/15/08 19:20	07/15/08 19:20
pH at 22.72°C	SM 4500-H+ B	**8.1**	Std. Unit	-	1	N/A	07/15/08 19:33	07/15/08 19:33

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.
MDC: Min Detectable Concentration

Report Authentication Code:

BSK Analytical Laboratories
Engineers & Laboratories

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Fresno, California 93706
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Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Janet Gutierrez
San Luis Water District
PO Box 2135
Los Banos, CA 93635

BSK Submission #: 2008071140
BSK Sample ID #: 1009996

Report Issue Date: 07/30/2008

Project ID:
Project Desc:
Submission Comments:
Sample Type: Liquid
Sample Description: 79.13R
Sample Comments:

Date Sampled: 07/14/2008
Time Sampled: 1000
Date Received: 07/15/2008

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Potassium (K)	EPA 200.7	**3.2**	mg/L	2	1	2.0	07/16/08	07/22/08
Selenium (Se) - Total	EPA 200.8	**11**	µg/L	2	1	2.0	07/16/08	07/25/08
Silver (Ag)	EPA 200.7	**ND**	mg/L	0.010	1	0.010	07/16/08	07/22/08
Sodium (Na)	EPA 200.7	**89**	mg/L	1.0	1	1.0	07/16/08	07/22/08
Sulfate (SO4)	EPA 300.0	**66**	mg/L	2	3	6.0	07/15/08	07/15/08
Thallium (Tl)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Total Dissolved Solids (TDS)	SM 2540 C	**760**	mg/L	5.0	1	5.0	07/15/08	07/17/08
Zinc (Zn)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.
MDC: Min Detectable Concentration

Report Authentication Code:

BSK Analytical Laboratories
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Amended Page

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Janet Gutierrez
San Luis Water District
PO Box 2135
Los Banos, CA 93635

BSK Submission #: 2008071140
BSK Sample ID #: 1009997

Report Issue Date: 08/12/2008

Project ID: Project Desc:

Submission Comments:
Sample Type: Liquid
Sample Description: 79.60L
Sample Comments:

Date Sampled: 07/14/2008
Time Sampled: 1009
Date Received: 07/15/2008

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Aggressive Index		13	-		1	N/A	07/30/08	07/30/08
Alkalinity (as CaCO3)	SM 2320 B	200	mg/L	3.0	1	3.0	07/15/08	07/15/08
Aluminum (Al)	EPA 200.7	ND	mg/L	0.050	1	0.050	07/16/08	07/22/08
Antimony (Sb)	EPA 200.8	ND	µg/L	2	1	2	07/16/08	07/24/08
Arsenic (As)	EPA 200.8	6.2	µg/L	2	1	2	07/16/08	07/24/08
Barium (Ba)	EPA 200.7	0.15	mg/L	0.050	1	0.050	07/16/08	07/22/08
Beryllium (Be)	EPA 200.8	ND	µg/L	1.0	1	1.0	07/16/08	07/24/08
Bicarbonate (as CaCO3)	SM 2320 B	200	mg/L	3.0	1	3.0	07/15/08	07/15/08
Boron (B)	EPA 200.7	0.64	mg/L	0.10	1	0.10	07/16/08	07/22/08
Cadmium (Cd)	EPA 200.8	ND	µg/L	1.0	1	1.0	07/16/08	07/24/08
Calcium (Ca)	EPA 200.7	84	mg/L	0.10	1	0.10	07/16/08	07/22/08
Carbonate (as CaCO3)	SM 2320 B	ND	mg/L	1.0	1	1.0	07/15/08	07/15/08
Chloride (Cl)	EPA 300.0	140	mg/L	1.0	2	2.0	07/15/08	07/15/08
Chromium - Total (Cr)	EPA 200.8	ND	µg/L	10	1	10	07/16/08	07/24/08
Conductivity - Specific (EC) @25°C	SM 2510 B	1000	µmho/cm	1.0	1	1.0	07/15/08	07/15/08
Copper (Cu)	EPA 200.7	ND	mg/L	0.050	1	0.050	07/16/08	07/22/08
Cyanide (CN)	SM 4500-CN-F	ND	µg/L	20	1	20	07/25/08	07/25/08
Fluoride	EPA 300.0	0.20	mg/L	0.10	1	0.10	07/18/08	07/18/08
Hardness (as CaCO3)	SM 2340 B	370	mg/L	1.0	1	1.0	07/30/08	07/30/08
Hydroxide (as CaCO3)	SM 2320 B	ND	mg/L	1.0	1	1.0	07/15/08	07/15/08
Iron (Fe)	EPA 200.7	ND	mg/L	0.050	1	0.050	07/16/08	07/22/08
Langelier Index (Saturation Index)	SM 2330 B	1.0	-	-	1	N/A	07/30/08	07/30/08
Lead (Pb)	EPA 200.8	ND	µg/L	5.0	1	5.0	07/16/08	07/24/08
Magnesium (Mg)	EPA 200.7	40	mg/L	0.10	1	0.10	07/16/08	07/22/08
Manganese (Mn)	EPA 200.7	ND	mg/L	0.010	1	0.010	07/16/08	07/22/08
MBAS, Calculated as LAS, mol wt 340	SM 5540 C	ND	mg/L	0.050	1	0.050	07/16/08 07:20	07/16/08 07:20
Mercury (Hg)	EPA 200.8	ND	µg/L	0.40	1	0.40	07/16/08	07/24/08
Nickel (Ni)	EPA 200.8	ND	µg/L	10	1	10	07/16/08	07/24/08
Nitrate (NO3)	EPA 300.0	34	mg/L	1.0	2	2.0	07/15/08 19:29	07/15/08 19:29
Nitrite (NO2-N)	EPA 300.0	ND	mg/L	0.050	2	0.10	07/15/08 19:29	07/15/08 19:29

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.
MDC: Min Detectable Concentration

Report Authentication Code:

BSK Analytical Laboratories
Engineers & Laboratories

1414 Stanislaus Street
Fresno, California 93706
(559) 497-2888
Fax (559) 485-6935

Amended Page

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Janet Gutierrez
San Luis Water District
PO Box 2135
Los Banos, CA 93635

BSK Submission #: 2008071140
BSK Sample ID #: 1009997

Report Issue Date: 08/12/2008

Project ID: Project Desc:
Submission Comments:
Sample Type: Liquid
Sample Description: 79.60L
Sample Comments:

Date Sampled: 07/14/2008
Time Sampled: 1009
Date Received: 07/15/2008

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Percent Sodium	EPA 200.7	**29**	%	-	1	N/A	08/07/08	08/07/08
pH at 23.19°C	SM 4500-H+ B	**8.1**	Std. Unit	-	1	N/A	07/15/08 19:42	07/15/08 19:42
Potassium (K)	EPA 200.7	**3.0**	mg/L	2	1	2.0	07/16/08	07/22/08
Selenium (Se) - Total	EPA 200.8	**5.6**	µg/L	2	1	2.0	07/16/08	07/25/08
Silver (Ag)	EPA 200.7	**ND**	mg/L	0.010	1	0.010	07/16/08	07/22/08
Sodium (Na)	EPA 200.7	**72**	mg/L	1.0	1	1.0	07/16/08	07/22/08
Sulfate (SO4)	EPA 300.0	**73**	mg/L	2	2	4.0	07/15/08	07/15/08
Thallium (Tl)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Total Dissolved Solids (TDS)	SM 2540 C	**600**	mg/L	5.0	1	5.0	07/15/08	07/17/08
Zinc (Zn)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
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(559) 497-2888
Fax (559) 485-6935

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Janet Gutierrez
San Luis Water District
PO Box 2135
Los Banos, CA 93635

BSK Submission #: 2008071140
BSK Sample ID #: 1009997

Report Issue Date: 07/30/2008

Project ID: Project Desc:

Submission Comments:
Sample Type: Liquid
Sample Description: 79.60L
Sample Comments:

Date Sampled: 07/14/2008
Time Sampled: 1009
Date Received: 07/15/2008

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Aggressive Index		**13**	-		1	N/A	07/30/08	07/30/08
Alkalinity (as CaCO3)	SM 2320 B	**200**	mg/L	3.0	1	3.0	07/15/08	07/15/08
Aluminum (Al)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Antimony (Sb)	EPA 200.8	**ND**	µg/L	2	1	2	07/16/08	07/24/08
Arsenic (As)	EPA 200.8	**6.2**	µg/L	2	1	2	07/16/08	07/24/08
Barium (Ba)	EPA 200.7	**0.15**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Beryllium (Be)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Bicarbonate (as CaCO3)	SM 2320 B	**200**	mg/L	3.0	1	3.0	07/15/08	07/15/08
Cadmium (Cd)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Calcium (Ca)	EPA 200.7	**84**	mg/L	0.10	1	0.10	07/16/08	07/22/08
Carbonate (as CaCO3)	SM 2320 B	**ND**	mg/L	1.0	1	1.0	07/15/08	07/15/08
Chloride (Cl)	EPA 300.0	**140**	mg/L	1.0	2	2.0	07/15/08	07/15/08
Chromium - Total (Cr)	EPA 200.8	**ND**	µg/L	10	1	10	07/16/08	07/24/08
Conductivity - Specific (EC) @25°C	SM 2510 B	**1000**	µmho/cm	1.0	1	1.0	07/15/08	07/15/08
Copper (Cu)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Cyanide (CN)	SM 4500-CN-F	**ND**	µg/L	20	1	20	07/25/08	07/25/08
Fluoride	EPA 300.0	**0.20**	mg/L	0.10	1	0.10	07/18/08	07/18/08
Hardness (as CaCO3)	SM 2340 B	**370**	mg/L	1.0	1	1.0	07/30/08	07/30/08
Hydroxide (as CaCO3)	SM 2320 B	**ND**	mg/L	1.0	1	1.0	07/15/08	07/15/08
Iron (Fe)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08
Langelier Index (Saturation Index)	SM 2330 B	**1.0**	-	-	1	N/A	07/30/08	07/30/08
Lead (Pb)	EPA 200.8	**ND**	µg/L	5.0	1	5.0	07/16/08	07/24/08
Magnesium (Mg)	EPA 200.7	**40**	mg/L	0.10	1	0.10	07/16/08	07/22/08
Manganese (Mn)	EPA 200.7	**ND**	mg/L	0.010	1	0.010	07/16/08	07/22/08
MBAS, Calculated as LAS, mol wt 340	SM 5540 C	**ND**	mg/L	0.050	1	0.050	07/16/08 07:20	07/16/08 07:20
Mercury (Hg)	EPA 200.8	**ND**	µg/L	0.40	1	0.40	07/16/08	07/24/08
Nickel (Ni)	EPA 200.8	**ND**	µg/L	10	1	10	07/16/08	07/24/08
Nitrate (NO3)	EPA 300.0	**34**	mg/L	1.0	2	2.0	07/15/08 19:29	07/15/08 19:29
Nitrite (NO2-N)	EPA 300.0	**ND**	mg/L	0.050	2	0.10	07/15/08 19:29	07/15/08 19:29
pH at 23.19°C	SM 4500-H+ B	**8.1**	Std. Unit	-	1	N/A	07/15/08 19:42	07/15/08 19:42

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
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Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Janet Gutierrez
San Luis Water District
PO Box 2135
Los Banos, CA 93635

BSK Submission #: 2008071140
BSK Sample ID #: 1009997

Report Issue Date: 07/30/2008

Project ID: Project Desc:
Submission Comments:
Sample Type: Liquid
Sample Description: 79.60L
Sample Comments:

Date Sampled: 07/14/2008
Time Sampled: 1009
Date Received: 07/15/2008

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Potassium (K)	EPA 200.7	**3.0**	mg/L	2	1	2.0	07/16/08	07/22/08
Selenium (Se) - Total	EPA 200.8	**5.6**	µg/L	2	1	2.0	07/16/08	07/25/08
Silver (Ag)	EPA 200.7	**ND**	mg/L	0.010	1	0.010	07/16/08	07/22/08
Sodium (Na)	EPA 200.7	**72**	mg/L	1.0	1	1.0	07/16/08	07/22/08
Sulfate (SO4)	EPA 300.0	**73**	mg/L	2	2	4.0	07/15/08	07/15/08
Thallium (Tl)	EPA 200.8	**ND**	µg/L	1.0	1	1.0	07/16/08	07/24/08
Total Dissolved Solids (TDS)	SM 2540 C	**600**	mg/L	5.0	1	5.0	07/15/08	07/17/08
Zinc (Zn)	EPA 200.7	**ND**	mg/L	0.050	1	0.050	07/16/08	07/22/08

mg/L: Milligrams/Liter (ppm)
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ND: None Detected at DLR
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MDC: Min Detectable Concentration

Report Authentication Code:

SAN LUIS WATER DISTRICT

WATER MANAGEMENT PLAN (2020)

APPENDIX N

Board Resolution Approving Water Management Plan

RESOLUTION NO. 21-1245

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SAN LUIS WATER DISTRICT APPROVING THE SAN LUIS WATER DISTRICT 2020 WATER MANAGEMENT PLAN

WHEREAS, under the terms of the Contract Between the United States and San Luis Water District Providing for Project Water Service San Luis Unit and Delta Division and Facilities Repayment, Contract No. 14-06-200-773A-IR1-P ("Contract"), the San Luis Water District ("District") is required to develop a water conservation plan as set forth in subsection 210(b) of the Reclamation Reform Act and 43 C.F.R. 427.1, Water Conservation Rules and Regulations; and

WHEREAS, the District is also required under the Contract terms to revise its water conservation plan at five-year intervals to reflect the then-existing conservation and efficiency criteria for evaluating water conservation plans and submit the revised Water Management Plan to the United States Bureau of Reclamation ("Reclamation") for review and evaluation; and

WHEREAS, District staff with the support of consulting services prepared the 2020 Water Management Plan in compliance with the 2020 Plan Criteria developed by the Reclamation and submitted the 2020 Water Management Plan to Reclamation for review and evaluation; and

WHEREAS, the Bureau of Reclamation has reviewed and evaluated the 2020 Water Management Plan, has determined that it meets the 2020 Plan Criteria current conservation and efficiency criteria, and provided correspondence to the District approving its contents; and

WHEREAS, the Board of Directors has reviewed the 2020 Water Management Plan as presented in Exhibit A and finds that it accurately describes the District's water management operations, practices, and objectives.

NOW, THEREFORE, BE IT RESOLVED, AS FOLLOWS:

Section 1. Declaration of the Board. The facts stated in the recitals above are true and correct, and the Board so finds, determines and orders.

Section 2. Water Management Plan. The Board of Directors adopts and approves the 2020 Water Management Plan as presented.

Section 3. Further Actions. The General Manager is hereby authorized to take any further actions deemed necessary or advisable in order to give effect to and comply with the intent of this Resolution and implement the 2020 Water Management Plan.

PASSED AND ADOPTED this 31st day of August, 2021, by the Board of Directors of the San Luis Water District, by the following vote:

VOTE:	**Ayes**	**Nays**	**Absent**	**Abstain**
President Diedrich			✓	
Director Coit	✓			
Director Maring	✓			
Director Teixeira	✓			
Director Wood	✓			

Mike Ward
for Bill Diedrich, President

Attest:

Tom Teixeira
Tom Teixeira, Secretary

Exhibit A – San Luis Water District 2020 Water Management Plan

United States Department of the Interior
BUREAU OF RECLAMATION
2800 Cottage Way
Sacramento, CA 95825-1898

IN REPLY REFER TO

CGB-410
2.2.4.22

Steven Stadler
San Luis Water District
1015 Sixth Street
Los Banos, Ca 93635

Subject: Five-Year Water Management Plan – San Luis Water District

Mr. Stadler,

The Bureau of Reclamation (Reclamation) is pleased to inform you that the San Luis Water District (District) Water Management Plan (Plan) has met the requirements contained in the 2020 Standard Criteria. The Federal Register closed with no public comments and it is therefore deemed adequate. Your next Plan will be due by December 31, 2025.

Reclamation's website, http://www.usbr.gov/mp/watershare will be updated to reflect the status of the District's Plan as well as direct members of the public to your website, https://slwdwater.com/ to obtain a copy of your Plan. Please notify us if there are any changes to the public accessibility of your Plan. Reclamation appreciates the effort committed to preparing a Plan. Annual Updates to the Plan are required to remain in compliance with your contract.

If you have any questions, please contact Thomas Hawes, Water Conservation Specialist by e-mail at thawes@usbr.gov or by phone (916) 978-5271.

Sincerely,

ADAM NICKELS

Digitally signed by ADAM NICKELS
Date: 2021.08.24 14:16:50 -07'00'

Adam M. Nickels
Regional Resources Manager