San Luis Canal Company

Water Management Plan

2020 Criteria

September 26, 2024

Index

San Luis Canal Company Water Management Plan –

Section I – Description of the District

District Name	San Luis Canal Company (SLCC)
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A. History

1. Date District Formed: 09/1913 Date of First Reclamation Contract: 09/15/1939

Original Size Acres: 47,285 Current Year (last complete calendar year): 2023

The San Luis Canal Company (hereinafter "Company" or SLCC) was formed in 1913. It is a Mutual Water Company, organized and existing under and by virtue of the laws of the State of California for the purpose of providing irrigation water to its shareholders. It qualifies as an exempt corporation under the provisions of Section 501(c)(12) of the Internal Revenue Code of 1954. The Company is governed by a seven-member Board of Directors elected by the Stockholders. It generally makes no profit and is operated for the sole benefit of the lands within its boundaries. The Company services an area of approximately 47,285 acres in Merced and Fresno Counties.

The Company holds pre-1914 water rights on the San Joaquin River but currently obtains its water supply through a Contract for Exchange of Waters (The "Exchange Contract" or Contract) with the United States Bureau of Reclamation (Reclamation). The amount of water to be received under the Contract depends upon whether the water year is classified as either a "Critical Calendar Year" (i.e., 123,000 acre- feet) or a "Non-Critical Calendar Year" (i.e., 163,600 acre-feet).

Over the years, the Company has constructed infrastructure, including lift pumps, drainage return systems, two regulating reservoirs, and installed a SCADA system and deep wells such that it can more effectively utilize its surface and groundwater supplies in a conjunctive use basis.

2. Current size, population, and irrigated acres

	2023
Size (acres)	47,285
Population Served (For Urban, number of connections)	N/A
Irrigated Acres	40,012

3. Water supplies received in current year

Water Source	AF
Federal urban water (Table 1)	N/A
Federal agricultural water (Table 1)	114,615
State water (Table 1)	N/A
Other Wholesaler (define) (Table 1)	N/A
Local surface water (Tbl 1)	N/A
Upslope drain water (Tbl 1)	30,674
District groundwater (Tbl 2)	7,401
Banked water (Tbl 1)	N/A
Transferred water (Tbl 1)	N/A
Recycled water (Tbl 3)	N/A
Other (Low Lift) (Tbl 1)	57,110
Total	209,800

4. Annual entitlement under each right and/or contract

	AF	Source	Contract #	Availability Period(s)
Reclamation Agriculture AF/Y	163,600	CVP	I1r-1144	Summer Flows /Non Critical Yr.

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

There has been a tendency to increase acres dedicated to permanent crops, and vegetables in the last 5 years.

6. Cropping patterns (Agricultural only)

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

Original Plan (2004)		Previous Plan (2016)		Current Plan (2023)	
Crop Name	Acres	Crop Name	Acres	Crop Name	Acres
COTTON	16,231	COTTON	12,619	TOMATOES	9,884
ALFALFA	13,979	TOMATOES	9,915	COTTON	8,397
TOMATOES	5,107	ALFALFA	6,296	WHEAT	7,322
		FALLOW	3,637	CORN	4,840
		WINTER CROPS	2,239	ALFALFA	4,008
				FALLOW	3,571
				ALMONDS	2,865
Other (<5%)	9,183	Other (<5%)	7,916	Other (<5%)	9,118
Total	44,500	**Total**	42,622	**Total**	50,005

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

Original Plan (2004)		Previous Plan (2016)		Current Plan (2023)	
Irrigation Method	Acres	Irrigation Method	Acres	Irrigation Method	Acres
Level basin	17,000	Level basin	8,657	Level basin	4,008
Furrow	24,000	Furrow	15,524	Furrow	25,716
Sprinkler	2,000	Sprinkler	306	Sprinkler	473
Low-volume		Low-volume	14,598	Low-volume	19,808
Multiple		Multiple	494	Multiple	
Other		Other		Other	
Total	44,500	**Total**	42,622	**Total**	50,005

B. Location and Facilities

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

1. Incoming flow locations and measurement methods

Location Name	Physical Location	Type of Measurement Device	Accuracy
Arroyo Canal Headworks	Arroyo Canal Headworks	Rated Gates & Doppler Flow meter (for redundancy)	+/- 3% & +/- 2%
Poso Slough	Poso Slough d/s of Indiana Rd.	Radar & Ultrasonic Flow meter	+/- 2%
San Juan Drain	San Juan Drain u/s of Mint Rd.	Doppler Flow meter	+/- 2%
Wood Slough	Wood Slough d/s Indiana Rd.	Radar & Ultrasonic Flow meter	+/- 2%
Boundary Drain A	Boundary Drain u/s of Cozzi Rd.	Radar & Ultrasonic Flow meter	+/- 2%
Boundary Drain C	Boundary Drain d/s of Britto Rd.	Radar & Ultrasonic Flow meter	+/- 2%

2. Current year Agricultural Conveyance System

Miles of Unlined – Canal	Miles of Lined – Canals	Miles of Pipe	Miles - Other
137	27	1.4	5.7 In-situ soil compaction

3. Current year Urban Distribution System

Miles of AC Pipe	Miles of Steel Pipe	Miles of Cast Iron Pipe	Miles - Other
NONE			

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

Name	Type	Capacity (AF)	Distribution or Spill
Central Reservoir	Regulating Reservoir	200 AF regulating capacity. Fills about 25 times per year making about 5,000 AF per year	Distribution
Island Reservoir	Regulating Reservoir	260 AF regulating capacity. Fills about 15 times per year making about 3,900 AF per year	Distribution

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

19 Low Lift Pumping Stations capture operational spill and return it to the delivery system. See Attachment A for the Low Lift Pump Locations.

SLCC has 4 outflow points: Arroyo Canal at Muller Weir, Boundary Drain downstream of Hillyer Rd., Salt Slough at Sand Dam, and Hereford Drain downstream of Wolfsen Rd. All these points are gravity flow.

6. Agricultural delivery system operation

Scheduled	Rotation	Other (Describe)
Arranged Schedule	No	On demand on the main artery and downstream of regulating reservoir

7. Restrictions on water source(s)

Source	Restriction	Cause of Restriction	Effect on Operations
Gravity	Monthly Allocation	Reclamation	Poor Efficiency
Gravity	Maximum Flow Allowance	Reclamation	Limits ability to meet demand
Gravity	Subsidence on the East side of the San Joaquin River (Outside of the Delta - Mendota Subbasin)	Pumping over-draft of lower aquifer happening outside the Delta-Mendota subbasin	Is affecting the ability to meet demand

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

The Company is continuing its modernization process started in 2004. The goal is to continue modernizing the canal delivery system to give more flexibility in canal operations. The Company is studying the possibility of installing two new reservoirs. One near the Arroyo Canal Headworks to provide a flexible supply into the Company, a second reservoir located on the Southwest edge of the Company's service area to serve multiple purposes of providing a flexible supply plus absorbing spills and flow mismatches from laterals. It will be part of a system that includes intercepting operational spills along Box Car Road and re-routing them to the existing central regulating reservoir and or the new SW reservoir.

C. Topography and Soils

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

The topography is very flat with approximately 0.0002 ft. slope to the northwest. Topography has a big impact on water management inside the Company's service area.

Due to subsidence occurring along the San Joaquin River, some of the canal systems on the east side of the district (closer to the San Joaquin River) are losing capacity, affecting the supply reliability.

2. District soil association map (Agricultural only)

See Attachment A, District Soils Map

Soil Association	Estimated Acres	Effect on Water Operations and Management
AGNAL CLAY LOAM	557	Ponding, Percs slowly (Under native cond.)
ALROS CLAY LOAM, PARTIALLY DRAINED	9,747	Ponding, Percs slowly (Under native cond.)
BISGANI LOAMY SAND, PARTIALLY DRAINED	1,283	High Percolation
BOLFAR CLAY LOAM, PARTIALLY DRAINED	12,567	Percs slowly (Under native conditions)
BRITTO CLAY LOAM	41	Ponding, Percs slowly (Under native cond.)
CHECKER LOAM	10	Ponding, Percs slowly (Under native cond.)
DOSPALOS CLAY LOAM, PARTIALLY DRAINED	8,821	Ponding, Percs slowly (Under native cond.)
DOSPALOS CLAY, HUMMOCKY	56	Ponding, Percs slowly (Under native cond.)
DOSPALOS CLAY, PARTIALLY DRAINED	2,249	Ponding, Percs slowly (Under native cond.)
EDMINSTER-KESTERSON COMPLEX	2	Percs slowly (Under native conditions)
ELNIDO CLAY LOAM, PARTIALLY DRAINED	1,236	Good Percolation
ELNIDO SANDY LOAM, PARTIALLY DRAINED	3,373	Good Percolation
ELNIDO SANDY LOAM, WET	76	Good Percolation
ESCANO CLAY LOAM, PARTIALLY DRAINED	2,170	Percs slowly (Under native conditions)
FLUVAQUENTS, CHANNELED	108	Ponding, Percs slowly (Under native cond.)
KESTERSON LOAM, PONDED	685	Percs slowly (Under native conditions)
KESTERSON SANDY LOAM	50	Percs slowly (Under native conditions)
PALAZZO SANDY LOAM, PARTIALLY DRAINED	2,930	Good Percolation
TRIANGLE CLAY, ALKALI	110	Ponding, Percs slowly (Under native cond.)
XEROFLUVENTS, CHANNELED	528	Ponding, Percs slowly (Under native cond.)

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

Soil Problem	Estimated Acres	Effect on Water Operations and Management
Salinity	0	
High-water table	9,950	Crop adjustment
High or low infiltration rates	3,360	Crop adjustment
Alkaline	200	Poor production

D. Climate

1. General climate of the district service area

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ave Precip	2.16	1.93	1.90	1.04	0.42	0.24	0.03	0.0	0.05	0.56	0.87	1.79	10.99
Ave Temp	46.7	51.5	56.0	61.7	69.3	76.7	82.6	80.8	75.7	65.9	54.3	46.4	64.0
Max Temp	55.4	61.3	67.5	73.7	82.7	91.4	97.7	96.5	90.7	78.7	64.9	55.3	76.3
Min Temp	40.6	43.3	47.3	50.9	57.6	63.9	69.3	67.9	63.4	54.6	45.4	39.8	53.7
ETo	1.32	2.27	4.06	5.89	7.92	8.73	8.62	7.47	5.72	3.99	1.96	1.26	59.2

Weather station ID: FRESNO (KFAT) Data period: Year 1993 to Year 2022
ET Station ID: CIMIS #124 Average annual frost-free days: 354
Frost Free Days – According to National Oceanic and Atmospheric Administration (NOAA), frost free days are days with temperatures greater than 28 degrees Fahrenheit.

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

N/A

E. Natural and Cultural Resources

1. Natural resource areas within the service area

Name	Estimated Acres	Description
None		

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

N/A

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

Name	Estimated Acres	Description
None		

F. Operating Rules and Regulations

1. Operating rules and regulations

   See Attachment B: San Luis Canal Company Rules and Regulations

2. Water allocation policy (Agricultural only)

Summary:
Since 2021 the Board of Directors adopted a Surface Water Allocation and a Supplemental Well Water policy that is reviewed every year. For year 2023 the Board approved the following allocation of water based on a Shasta Non-Critical Water Year.
- 7-Month surface water allocation of 2.8 AF/AC (April-October 2023)
- 5-Month surface water allocation of 0.5 AF/AC (January, February, March, November, December 2023)

Additional Supplemental Well Water could be purchased for $93.50 per AF.

3. Official and actual lead times necessary for water orders and shut-off

See Attachment B, Page 4

Official = 48 hours for the Company to the Water Authority

Actual = 24 hours or less for the Company's water users depending on water availability and delivery location related to the regulating reservoirs.

Rule 5 of the company's Rules and Regulations state:
APPLICATION FOR WATER
The "SECOND AMENDED CONTRACT FOR EXCHANGE OF WATERS" states, among other things, "The Contracting Entities (COMPANY being one of the Entities) shall furnish estimates of their aggregate monthly delivery requirements and their daily delivery schedules for each weekly period, which shall be submitted to the United States at least 48 hours prior to the beginning of the delivery period."

Since the delivery schedule hereinabove referred to pertains to water delivered into Mendota Pool and not into the COMPANY's or DISTRICT's canal system, Shareholder and/or their tenants shall be required to apply for water at least twenty-four hours in advance of the date for which water is requested. Water will be delivered on requests made less than twenty-four hours provided such water is available and deliveries can be made without interference with other users and without undue waste of water or undue manipulation of weirs and gates.

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

See: Attachment "B"
San Luis Canal Company Rules and Regulations
Rule #11, and Rule #13, on Page 8.

5. Policies on water transfers by the district and its customers
   See Attachment B, page 58.

See: Attachment "B" SLCC and Transfer Policies Summary: The Company developed several transfer programs: the Conserved Water program, the Land Fallowing programs and the Private Well Exchange program. SLCC has regularly participated in water transfer programs through the SJRECWA, to the benefit of other agricultural water users, wildlife refuges, and M&I users. The water conservation actions both on-farm and on the canal and drainage delivery system implemented have directly supported these transfers and, in the process, enhanced the overall beneficial use of water in the service area and surrounding areas as well. SLCC transferred to the U.S. Fish and Wildlife Service water for the refuges and additional water to westside agricultural users. SLCC transferred water through the Exchange Contractors varying amounts of water to combinations of refuges, agricultural users and urban water users. These transfers by the Exchange Contractors have been critical in addressing the ongoing water needs for the refuges as well as other agricultural and non-agricultural users.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers – Refer to BMP A.1. Information on water measurement for agricultural contractors is completed under BMP A.1 on Section III page 24.

2. Urban Customers

   a. Total number of connections ________________________

   b. Total number of metered connections ________________________

   c. Total number of connections not billed by quantity ________________________

   d. Percentage of water that was measured at delivery point ________________________

   e. Percentage of delivered water that was billed by quantity ________________________

   f. Measurement device table

Meter Size and Type	Number	Accuracy* (+/- Percentage)	Reading Frequency (Days)	Calibration Frequency (Months)	Maintenance Frequency (Months)
5/8" - 3/4"					
1"					
1-1/2"					
2"					
3"					
4"					
6"					

Meter Size and Type	Number	Accuracy* (+/- Percentage)	Reading Frequency (Days)	Calibration Frequency (Months)	Maintenance Frequency (Months)
8"					
10"					
Compound					
Turbo					
Other (define)					
Total					

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

3. Agricultural and Urban Rates

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

See Attachment B, Page 58 for year 2023 rate flyer. Water delivery reports and water invoices are billed monthly.

b. Annual charges collected from agricultural customers

Fixed Charges

Charges ($ by unit)	Charge Units ($/acre, etc)	Units Billed During Year (acres, etc)	Total $ Collected ($ times Units)
$35.00	$/acre	44,456 acres	$1,559,110.00

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

Volumetric Charges

Charges ($ by unit)	Charge Units ($/AF, etc)	Units Billed During Year (AF, etc)	Total $ Collected ($ times Units)
$24.00	$/AF	40,810	$979,440.00
$28.00	$/AF	40,810	$1,142,680.00
$29.00	$/AF	40,810	$1,183,490.00
$30.00	$/AF	7,570	$227,100.00

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

c. Describe the contractor's record management system

Water is measured and recorded daily by Canal Riders. Measurements are audited by office staff. The water measurements are entered automatically from handheld recorder units in STORM. STORM is a utility billing computer program. The program calculates the tiered water rates and generates the water usage reports. Water users are provided with a summary of monthly water use invoices and also can access their water usage and account status on-line at the Company's website: (www.slcc.net) using their username and password in real time. The Water User Interface (Water UI) provides Shareholders with the most updated information about their water usage and can be accessed from the main page of the SLCC website, by clicking "Shareholder Portal"
Detailed information is available upon request. Water records for individual fields and turnouts are available for 17+ years.

H. Water Shortage Allocation Policies

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

Since 2021 the Board of Directors adopted a Surface Water Allocation and a Supplemental Well Water policy that is reviewed every year. In case the Water year is declared Critical, the Board approved the following allocation of water based on a Shasta Critical Water Year.
- 7-Month surface water allocation of 2.5 AF/AC (April-October 2023, *Shasta Critical Year*)
- 5-Month surface water allocation of 0.5 AF/AC (January, February, March, November, December 2023)

Water shortages are partially made up by Company and Private deep wells. If a shortage is identified, water could be allocated monthly.

2. Current year policies that address wasteful use of water and enforcement methods
See Attachment B, San Luis Canal Company Rules and Regulations, Pgs. 7, 8; Rule 8.

The tiered pricing structure discourages wasteful use of water. In addition, the rules and regulations address the waste of water.

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

Discuss possible modifications to policies and solutions for improved water management

SLCC is an Exchange Contractor, the conveyance and storage policies of the Central Valley Project affect San Luis Canal Company differently than Reclamation's federal contractors because of the Exchange terms.

The 5 month – 7 month provisions of the Exchange Contract and per month limit has historically been potentially restrictive as it relates to managing water in the summer months versus the fall and winter. Yet, both Reclamation and the Exchange Contractors have agreed to annual management strategies that allow flexibility within the contract terms. Each of the Exchange Contractors coordinates with the other Exchange Contractors to comply with the other terms of the Exchange Contract. Those Exchange Contractors who have groundwater within their service areas endeavor to time the production of groundwater to meet both the requirements of the Exchange Contractors but also to attempt to aid maximization of storage reserves in San Luis Reservoir for the CVP in order to allow greater amounts of predictable storage in the early spring planting period and avoidance of risk of low point storage difficulties in San Luis Reservoir. This tool, which can only be available by relaxation of the 5 month -7 month limitation and relaxation of the per month limitation during peak use periods in the summer, has allowed, and can allow in the future, for not only greater operational flexibility to the CVP but also can result in additional water being available for transfers once operational safety margins are known to be achieved.

The recently signed "Pilot Program" Memorandum of Understanding (MOU) between the BOR and Friant Water Authority, San Luis and Delta Mendota Water Authority, and SJRECWA to establish a South of Delta Drought Resiliency Framework. The MOU establishes an approach to implement drought resiliency projects and framework, which includes a drought plan that allows the agencies to conserve and store or exchange a portion of their water deliveries for use in future years with lower supplies.

The proposed "Drought Plan" will allow the signatories to voluntarily conserve, securely store or exchange a portion of their CVP south of Delta deliveries for subsequent use, reducing reliance on Delta exports in the driest hydrologic conditions. Through South of Delta Accounting of Storage Improvements and better understanding and accounting of Conveyance losses, a Drought Pool will improve the reliability of water supplies for south of Delta communities, farms, and ecosystems dependent on CVP water.

Based on SLCC's continued modernization of its facilities, along with its landowners improving their applied water techniques, conserved water has been generated that has allowed Reclamation to provide flexibility in San Luis Reservoir for the benefit of all users.

SLCC and the other Exchange Contractors will continue to work with Reclamation on future policies and programs that both conserve water and allow flexibility to all CVP water users.

Section II – Inventory of Water Resources

A. Surface Water Supply

1. Surface water supplies in acre feet, imported and originating within the service area, by month (Table 1)
   163,600 AF –Non-Critical WY, 123,100 AF- on Critical WY, by contract.
   202,399 AF for year 2023

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

   Table 8 shows actual values. Reductions due to Shasta Critical Water Years in 2014, 2015, 2021 and 2022

B. Groundwater Supply

1. Groundwater extracted by the district and delivered, by month (Table 2) –See - Water Inventory Tables, Table 8

2. Groundwater basin that underlies the service area

Name	Size (Square Miles)	Usable Capacity (AF)	Safe Yield (AF/Y)
Delta-Mendota Subbasin (5-022.07)	747,700	4,440,000 AF	116,000 AF/Y

3. Map of district-operated wells and managed groundwater recharge areas
   See Attachment A, for District Map of Groundwater Wells

4. Description of conjunctive use of surface and groundwater
   SLCC utilizes deep wells to supplement surface water supplies primarily during peak demand periods. The details of the required information that describes the groundwater conjunctive use program are in the single Groundwater Sustainability Plan (GSP), on the following link 0 Executive Summary.pdf (deltamendota.org)

5. Groundwater Management Plan
   See the Draft of the single Delta-Mendota Subbasin Groundwater Sustainability Plan at Draft GSP Documents – Delta-Mendota SGMA (deltamendota.org). SLCC is part of the SJREC GSA which is one of 23 GSA's that have been developed in the Delta-Mendota Subbasin. In response to March 2023 DWR's "inadequate" determination, the 23 Basin GSAs collectively agreed to develop a single GSP for the Basin that synthesizes, updates, and replaces content from the 2022 GSPs and Common Chapter to address the Corrective Actions outlined by DWR. This single GSP has been developed to meet the SGMA regulatory requirements, respond to DWR's deficiencies, respond to comments provided by SWRCB, and increase existing coordination among the Basin's 23 GSAs.

6. Groundwater Banking Plan

   SLCC banks water through the SJRECWA in Rosedale-Rio Bravo Water Storge District though a 2:1 exchange program for future year return and/or water transfer program.
   Since 2017 SLCC conveyed 9,340 AF to the banking facility, returned 1,212 AF in year 2021 and has 2,759 AF of water available to be returned during drought years.

   See Attachment E for the SJRECWA – Rosedale-Rio Bravo Water Storage District agreement

Year	Conveyed Water AF	Returned Water AF	Balance of return Water AF
2017	2,850	-	1,212
2018	-	-	1,212
2019	2,112	-	2,110
2020	482	-	2,315
2021	-	1,212	1,103
2022	-	-	1,103
2023	3,896	-	2,759

C. Other Water Supplies

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

See Water Inventory Tables, Table 8 for year 2023 pumped amounts.
Low Lift pumps (recaptured tail water and operation canal spill)
See: Table 1 "Other Water". The Company has 19 low lift pumping plants throughout the service area that lift drain water and captured canal spill to be recycled.
See Attachment A for the 19 Low Lift Pump Locations.

D. Source Water Quality Monitoring Practices

1. Potable water quality (Urban only)

   N/A

   Agricultural water quality concerns: [ ] No [X] Yes (if yes, describe)

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

Due to the aggressive recirculation program, staff is concerned with the high salt concentration in the irrigation and drainage water. Since 2005, the Company has developed a detailed water quality monitoring program regarding EC and manages the water operations and pumping programs based on the data.
Real time water quality sensors were installed at key points and data is collected via the SCADA system. Weekly samples are taken manually and monthly samples are taken at the deep well discharges, tileline discharges and re-circulating low lift pumps. In 2023 there has been a significant improvement in the water quality primarily due to a very wet year flood releases form Friant reservoir and San Joaquin River restoration flows.

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

Analyses Performed	Frequency	Concentration Range	Average
EC at Arroyo Headworks	Real time	20 - 670 umoh/cm	290 umoh/cm
EC at upslope drains	Real time	150 – 1,300 umoh/cm	1,000 umoh/cm

Analyses Performed	Frequency	Concentration Range	Average
EC at outlet points	Real time	400 – 2,200 umoh/cm	1,500 umoh/cm
EC in the canals	Weekly	150 – 600 umoh/cm	400 umoh/cm
EC Low Lifts	Monthly	40 – 1,400 umoh/cm	1,000 umoh/cm

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

Analyses Performed	Frequency	Concentration Range	Average
EC groundwater wells	Monthly	700 – 2,150 umoh/cm	1,250 umoh/cm
EC tilelines	Monthly	300 – 3,350 umoh/cm	1,700 umoh/cm

E. Water Uses Within the District

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

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

Crop Name	Total Acres	Level Basin (Acres)	Furrow (Acres)	Sprinkler (Acres)	Low Volume (Acres)	Multiple Methods (Acres)	Other (Acres)
TOMATOES	9,884		621		9,263		
COTTON	8,397		5,541		2,856		
WHEAT	7,322	3,170	558	2,018	1,576		
CORN	4,840		3,663		1,177		
ALFALFA	4,008	3,739			269		
IDLE / FALLOW	3,571						N/A
ALMONDS	2,865				2,865		
MELONS	1,227		622		605		
WILDLIFE REFUGES	1,877	1,877					
OATS	1,076		893		183		
PISTACHIOS	846				846		
GARLIC	827		466		361		
PASTURE	821	821					
ONIONS	545		50		495		
WATERMELONS	480				480		
CARROTS	382			328	54		
NATIVE GRASS SEEDS	275		159	96	20		
SORGUM - SUDAN GRASS	178		178				
OTHERS	584						N/A

3. Urban use by customer type in current year

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

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

Treatment Plant	Treatment Level (1,2,3)	AF	Disposal to/Uses
N/A			
	Total		
Total discharged to ocean and/or saline sink			

5. Groundwater recharge in current year (Table 6)

Contractor operated ground-water recharge areas (as identified in Section II, B).
SLCC doesn't have a groundwater recharge program per say, but there is an un-quantified amount of seepage losses (23,160 AF in Table 4) from the 137 miles of unlined canals and reservoirs that contribute to the recharge of the groundwater basin. Information on Table 6 District water inventory.

Recharge Area	Method of Recharge	AF	Method of Retrieval
Canals, drains and reservoirs	Seepage	23,160	Deep wells
	Total	23,160	

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

From Whom	To Whom	AF	Use
	Total		

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

From Whom	To Whom	AF	Use
SLCC	SLDMWA	6,137	Ag
SLCC	SLDMWA	83	M&I
SLCC	Reclamation	16,164	Refuges
SLCC	Rosedale-Rio Bravo WSD	3,896	Water banking
SLCC Fallow	Reclamation – Triangle-T	3,965	Ag
SLCC Fallow	Reclamation - WWD	1,982	Ag
SLCC Fallow	Reclamation - DPWD	1,982	Ag
	Total	34,209	

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

From Whom	To Whom	AF	Use
Reclamation	US FISH & WILDLIFE	25,936	Refuges
Reclamation	CA FISH & WILDLIFE	9,547	Refuges
Reclamation	G.R.C.D.	8,766	Duck Clubs
	Total	44,249	

8. Other uses of water

Other Uses	AF
Exchange Eastside Canal Irrigation Co. / Panoche WD	5,000

F. Outflow from the District (Agricultural only)

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

There are 4 points where outflows occur from SLCC service area showed on the Facility map:

- Muller Weir: operational spills are measured and combine flows from both SLCC and CCID canals.
- Salt Slough at Sand Dam: is the drainage point for roughly 138,000 acres from which about 55,000 acres are from irrigated agriculture and 83,000 acres of managed wetlands within CCID, Grasslands Water Districts and SLCC. From these acres SLCC contributes with roughly 33,000 acres.
- Boundary Drain downstream of Hillyer Road: is the drainage point for 13,500 acres within SLCC and unknown area of CCID and Grasslands Water District.
- Hereford Drain the drainage point for roughly 1,500 acres from SLCC Service area

Real time monitoring flow devices were installed at these 3 sites since 2008. Flows are calculated over the weir at Muller weir, and Doppler acoustic meters were installed at Sand Dam, Boundary Drain, and Hereford Drain. All these devices have an accuracy of +/- 5%.

1. Surface and subsurface drain/outflow

Outflow Point	Location Description	AF	Type of Measurement	Accuracy (%)	% of Outflow	Acres Drained
Muller Weir	End of Arroyo Canal (spill)	4,440	Weir	5	9	N/A
Sand Dam	Salt Slough at Sand Dam	20,727	Doppler	5	41	138,000
Boundary Dr.	Boundary Drain downstream Patton Rd.	22,971	Doppler	5	46	13,500
Hereford Dr.	Hereford Drain downstream Wolfsen Rd.	2,052	Doppler	5	4	1,500

Outflow Point	Where the Outflow Goes (Drain, River, or Other Location)	Type Reuse
Muller Weir	Drain	Duck Clubs
Sand Dam	Salt Slough	Refuges
Boundary Dr.	Mud Slough	Refuges
Hereford Dr.	Salt Slough	Refuges

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

SLCC participates in the San Joaquin Valley Drainage Authority and the Westside San Joaquin River Watershed Coalition which encompasses an area of approximately 460,000 acres. The Coalition conducts sampling on a monthly basis and storm events throughout the area and also uses the data of the monitoring station at Sand Dam. The major concerns for the Regional Water Control Board are exceedances of pyrethroids and diuron. A copy of the Annual Report Dated June 30, 2023 is attached as Attachment G

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

Analyses Performed	Frequency	Concentration Range	Average	Reuse Limitation
EC, Boron, Selenium, etc.	Monthly during the irrigation season (March - October	See Attachment G	Attachment F	No

Outflow (subsurface drainage) Quality Testing Program: Outflow Not Sampled

Analyses Performed	Frequency	Concentration Range	Average	Reuse Limitation
EC on tileline water	Monthly	See Section D.4	See Section 4.	No when blended
(within the service area – not outflow)				

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.

Surface drains are tested monthly. See Section II. F 2., and ATTACHMENTS F and G.

The Canal Company is 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)," therefore the Water Inventory Table 7 and Addendum C were completed.

Water Inventory Table 7: Influence on Groundwater and Saline Sink

G. Water Accounting (Inventory)

See Section 4. District Water Inventory

Note: Completing Tables 1 through 8 satisfies all water accounting data.

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%

Company uses mainly metered gates with stilling wells or whistle pipes to measure the water delivered to each water user. These are considered Standard flow measurement devices.
Also the Company is implementing a program to increase water measurement accuracy by installing long crested weirs (LCWs) or automatic water level control devices at key points within the system, to maintain the water level constant. Since 2005 there have been 67 LCWs, 22 ITRC flap gates, 7 Lopac gates, 2 Langeman gates and 12 automated flow control structures installed. Very close supervision is taken on the turnout delivery beginning and ending times.
There are also 96 drip irrigation systems throughout the district which use flow meters with totalizers.

a. Number of delivery points (turnouts and connections) 696

b. Number of delivery points serving more than one farm 9

c. Number of measured delivery points (meters and measurement devices) 696

d. Percentage of water delivered to the contractor that was measured at a delivery point Percentage of water that was measured at 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)
Propeller meters	96	+/- 5%	Daily	Annual (1)	Monthly (2)
Metered gates	600	+/- 6%	Daily	Bi-Annual	Annual Inspection
Total	696				

(1) Sent to manufacturer
(2) The company operators keep records of Hours and Rate per hour. The data is compared to monthly meter readings. If there is a large discrepancy, meters are sent to manufacturer for re-calibration.

The company also has been standardizing the turnout design and size by installing Waterman gates in 2 sizes: 18 and 24 inches in diameter. These gates were calibrated at the water delivery facility at the Cal Poly Irrigation Training and Research Center (ITRC) for laboratory testing and verification under different submergence conditions. This way accurate discharge tables were developed for all the different types and sizes of metered gates used in the Company's canals that take in consideration the exact location of the stilling wells and the condition of submergence. The new tables were entered into the handheld units used by the ditchtenders. These handheld units run the water accounting program "Storm" that calculates the actual flow discharges and keeps track of water deliveries.

There are 9 turnout
gates
serving 2 farms, none serve 3 farms. In these cases:

a. *No more than two deliveries will be made simultaneously from any single lateral delivery measurement point – unless any additional deliveries have their own individual standard measuring device. For example, down a ditch one farmer may have a flow meter on a drip system. Two other deliveries could therefore be made simultaneously from the same ditch.*

b. *In the case that Company receives complaints from individual farmers regarding billing. The protocol includes:*

   i. Documentation of all such complaints.

   ii. Documentation of what was done to resolve each complaint.

In the case of a dispute with the volume of water charged, the engineering department measures the flow rate using the conventional USGS mid-section current-meter method. A current meter HACH Model FH950 is used to determine the point velocity measurements across sections of the farm ditches downstream of the delivery meter gate at both farmers' delivery points.

At the delivery points serving more than one farm, the ditchtender verifies who is taking water at any given time. The ditchtender verifies with the 2 farmers taking water, how much water each one is delivering to their respective farms. From the total flow measured at the meter gate, the ditchtender determines and verifies with the two irrigators how much water each is diverting. The irrigators usually use siphon pipe counts to check their deliveries against the ditchtenders charges.

* Documentation verifying the accuracy of measurement devices are included in Attachment C.

2. Designate a water conservation coordinator to develop and implement the Plan and develop Annual Updates.

Name Alejandro Paolini Title Water Conservation Specialist

Address 11704 W. Henry Miller Ave., Dos Palos CA 93620

Telephone (209) 826-5112 ext. 206 Email apaolini@hmrd.net

See Attachment J for job description and minimum qualifications

3. Provide or support the availability of water management services to water users
See Attachment I, Notices of District Education Programs and Services Available to Customers.

See Attachment H, Sample of provided materials and Notices of District Education Programs and Services Available to Customers and Attachment I, On-Farm Water Conservation Policy and program.

4. On farm irrigation and drainage system evaluations using a mobile lab type assessment

	Total in District	# Surveyed Last Year	# Surveyed in Current Year	#Projected for Next Year	# Projected 2nd Year in Future
Irrigated Acres	40012	0	0	200	200
Number of Farms	101	0	0	3	3

Available through DWR and Reclamation funding. Company farmers can contract for mobile lab and other services. ITRC through funding from the Reclamation and DWR have the evaluation team available almost every year.

a. Timely field and crop-specific water delivery information to the water user

Data is collected by canal riders daily and compiled automatically in office daily. This information is available upon request and is also available on-line at the Company's web site; www.slcc.net through the Shareholder's Portal – Water User's Interphase WaterUI, accessible with username and password. The monthly water bill contains all the details of acres, crops and daily volumetric usage by field.

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

The Company provides weather station data and promotes the use of CIMIS data.
The Company informs the growers via mail and email, about the availability of the data on the Company's web site, www.slcc.net, under the "Water Conservation Information / CIMIS Website Link" tab.

The Company also promotes and assists the interested growers by walking them through irrigation scheduling techniques with the ITRC California Crop and Soil Evapotranspiration data at www.itrc.org/reports/californiacrop.htm and UC Cooperative Extension's CropManage at https://cropmanage.ucanr.edu/.

SLCC provides technical assistance to all the farmers on accessing and using the evapotranspiration information from the CIMIS web site wwwcimis.water.ca.gov, Unfortunately, Station No. 56, Los Banos, San Joaquin Valley Region-Merced County was "temporarily" removed in 2022. Station No. 56 was centrally located in the company's service area and provided ETo information along with temperature and precipitation data. SLCC is actively pursuing the re-deployment of the new CIMIS Station No. 269.
With the new capabilities provided by the Spatial CIMIS, accurate information can be retrieved for precise irrigation scheduling based on geographical location of the farmer's fields.
Advertisement and information is provided to interested growers and agronomists working in the area upon request at the office front desk.

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

Water quantity lab results are available through the Water Conservation Specialist at the SLCC office for water users to review, upon request. If any problem arises the farmers in the affected area will be immediately notified.

Nitrogen in Irrigation Water maps are prepared and posted on-line at Henry Miller Reclamation District #2131 - Nitrogen in Irrigation Water 07-12-23 w-recommendation.pdf - All Documents (sharepoint.com) semi-annually.

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

Program	Co-Funders (If Any)	Yearly Targets
SLCC Web Page		Available on demand
Field Evaluations	Cal Poly through DWR & USBR funds	1 to 5 fields
ILRP	Westside SJ River Watershed Coalition	All Farmers
Pump Efficiency Program	PG&E – Fresno State CIT	Bi-annual tests
Ag-Suitability Lab Test	N/A	Annually
District letters		Semi-annually

See Attachment H for samples of provided materials and notices

e. Other

N/A

5. Pricing structure – based at least in part on quantity delivered. Adopt a water pricing structure based on the measured quantity delivered

A Volumetric tiered water rate is in place.

Assessment.........$35.00/Acre

0.0 – 1.0 AF.........$ 24.00/AF
1.0 – 2.0 AF.........$ 28.00/AF
2.0 – 3.0 AF.........$ 29.00/AF
3.0 – 4.0+AF........$ 30.00/AF

See Section I. G.3.a and b AND Attachment B page 58 for more details

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

	Total in District	# Surveyed Last Year	# Surveyed in Current Year	#Projected for Next Year
Wells	77	15	52	16
Lift Pumps	54	54	38	20

An outside pump service company evaluates efficiency every year under the Advanced Pumping Efficiency Program APEP by the Center for Irrigation Technology (C.I.T.). This program provides a subsidized test for overall pump efficiency every other year.

Company pumps are maintained by staff. Pumping documentation is maintained continually by staff and is monitored monthly and discrepancies are investigated.
The Company has a goal to maintain the overall pump efficiency above 55%. The Company also pays for the private pumping test and coordinates the site visits with the pump service company.

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)	13,760	None identified
Poor drainage	0	None identified
Groundwater Selenium concentration > 50 ppb	0	None identified
Poor productivity	0	None identified

Managed by the farm operators adjusting the crop selection and irrigation management for high water table areas. *i.e.*, crop pattern, irrigation method, irrigation management, and fallowing.

Describe how the contractor encourages customers to participate in these programs

The company activated 2 fallowing programs: Landowner to Landowner Fallowing Program and the SLCC Rotational Fallowing Program. The first one allows farmers that own land in SLCC and on the West side to transfer water to themselves. For the second one, a willing participant could fallow a limited amount of ground to generate water that would have been consumptively used and could be transferred by the Company.

2. Facilitate use of available recycled urban wastewater

Sources of Recycled Urban Waste Water	AF/Y Available	AF/Y Currently Used in District
None	0	0

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

The Company facilitates funds for capital improvements for on-farm irrigation systems through its On-Farm Water Conservation Program that grants money and provides low interest loans. A copy of the On-Farm conservation policy can be found in Attachment I.
The conservation program covers 50% cost share for on-farm improvements and assists the landowners and growers with system design and applying for additional funds available through NRCS - EQIP program.
See: *Attachment I - On-Farm Water Conservation Policy*

4. Incentive pricing
   Describe incentive rate structure or other programs and purpose
   See Volumetric Pricing—Section 1. G. 3. A, b and c.
   The purpose of the incentive pricing is to provide motivation to use water efficiently. The combination of a fixed charge as an assessment and the tiered water rate as the Company's rate schedule holds water users accountable for their own irrigation water applications. There is a direct relationship between farm deliveries and water bills, so the incentive to take unnecessary deliveries is reduced, and water will be used more efficiently.

5. a. Line or pipe ditches and canals

Canal/Lateral (Reach)	Types of Improvement	Number of Miles in Reach	Estimated Seepage (AF/Y)	Accomplished/Planned Date
Carlucci Ditch	Geomembrane + Concrete	0.3	90	2023
Duni Ditch Lat. A	Concrete Canvas	0.3	8	2023
Community Ditch	Geomembrane + Concrete	0.2	22	2024 Planned
River Ditch	Geomembrane + Concrete	0.8	102	2025 Planned
Middle Ditch	Geomembrane + Concrete	1.0	100	2025 Planned

5. b. Construct/line regulatory reservoirs

Reservoir Name	Location	Describe Improved Operational Flexibility and AF Savings
Central Reservoir	Delta Canal System	Improved flexibility and reduced operation spill. 200 AF regulating capacity. Fills about 25 times per year, saving about 5,000 AF per year
Island Reservoir	Island Canal System	Improved flexibility and reduced operation spill. 260 AF regulating capacity. Fills about 15 times per year, saving about 3,900 AF per year

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

The Company allows "on the spot" water orders and shut offs, only on the canal ponds adjacent to the regulating reservoirs and encourages flexibility to improve on-farm efficiencies.
The water orders and shut-off calls are handled directly by the canal riders, who have more flexibility to route the flow discrepancies to and from the regulating reservoirs, therefore reducing the spill out of the Company's boundary.

7. Construct and operate district spill and tailwater recovery systems

Distribution System Lateral	Annual Spill (AF/Y)	Quantity Recovered and Reused (AF/Y)
Box Car Rd. Interceptor	2,200	1,500
Total		**1,500**

Drainage System Lateral	Annual Drainage Outflow (AF/Y)	Quantity Recovered and Reused (AF/Y)
Continued evaluation of drain water recovery opportunities (Cal Poly System Optimization Review)	45,750	23,000 AF potentially reused/recovered
Boundary Drain	22,900	1,760
Salt Slough Drain	20,700	28,960
Total	**43,600**	**30,720**

Describe facilities that resulted in reduced spill and tailwater

Drainage and operational spill water that would normally end up as spill at the end of the Company boundary is lifted, recycled and reused though 19 low lift pumping stations and regulating reservoirs. The Company is currently recycling and reusing more than 65,000 AF and there are about 44,000 AF of drainage water leaving the service are boundaries.

8. Plan to measure outflow

a. Total # of outflow (surface) locations/points ______4_______

b. Total # of outflow (subsurface) locations/points ______0_______

c. Total # of measured outflow points ______4_______

d. Percentage of total outflow (volume) measured during report year ____100%_____

Four (4) monitoring stations connected to SCADA were installed previously at Muller Weir, Sand Dam, Boundary Drain, and Hereford Drain. These stations measure the flow and monitor the water quality in real time with an accuracy of +/- 5% through acoustic Doppler flow meters.
These four monitoring stations enable the Company's SCADA system to measure and record 100% of the drainage outflow volume.

e. Identify locations, prioritize, determine best measurement method/cost, submit funding proposal ______N/A_______

Estimated Cost (in $1,000s)

Location and Priority	Current Year	Year 2	Year 3	Year 4	Year 5
N/A					

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

The Company will continue with its current conjunctive use program based on the optimization use of the available water supplies of surface water and groundwater resources.
See: Section II. B. 4

10. Automate distribution and/or drainage system structures
Identify locations where automation would increase delivery flexibility and reduce spill and losses. Describe program to achieve these benefits and estimate the annual water savings

The Company successfully completed the automation of a series of canal flow control structures and water level control structures. The Company is studying more canal automation projects and alternative funding opportunities to assist the Company in continuing improving the conveyance system efficiency.

11. Facilitate or promote water customer pump testing and evaluation

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

Customers can obtain pump testing from local pump companies. PG&E has resumed its yearly pump test program. Growers are encouraged through media announcements to test pumping facilities. The Advanced Pumping Efficiency Program by PG&E through the Center for Irrigation Technology (C.I.T.) based in Fresno, provides a subsidized test for overall pump efficiency every other year.

12. Mapping

Estimated Cost (in $1,000s)

GIS Maps	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027
Layer 1 – Distribution system	1.0	1.0	1.0	1.0	1.0
Layer 2 – Drainage system	0.4	0.4	0.4	0.4	0.4
Suggested layers:					
Layer 3 – Groundwater information	0.4	0.4	0.4	0.4	0.4
Layer 4 – Soils map	0.2	0.2	0.2	0.2	0.2
Layer 5 – Natural & cultural resources	2.0	2.0	2.0	2.0	2.0
Layer 6 – Problem areas	2.0	2.0	2.0	2.0	2.0

C. Provide a 5-Year Budget for Implementing BMPs

1. Amount actually spent during current year (2023)

Year 1 (2023) BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$31,000	360
A2	Conservation staff	$10,000	1000
A3	On-farm evaluation/water delivery info, Water quality Agricultural Education Program	$15,000	420
A4	Quantity pricing	$0	0
A5	Contractor's pumps	$10,000	48
B1	Alternative land use	$5,000	132
B2	Urban recycled water use	$0	0
B3	Financing of on-farm improvements	$1,103,000	400
B4	Incentive pricing	$0	0
B5	Line or pipe canals/install reservoirs	$747,500	709
B6	Increase delivery flexibility	$605,000	225
B7	District spill/tailwater recovery systems	$122,500	0
B8	Measure outflow	$90,000	112
B9	Optimize conjunctive use	$250,000	40
B10	Automate canal structures	$60,000	360
B11	Customer pump testing	$8,000	30
B12	Mapping	$6,000	280
	Total	**$3,063,000**	**4116**

2. Projected budget summary for the next year (2024)

Year 2 (2024) BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$74,500	225
A2	Conservation staff	$10,000	1000
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality Agricultural Education Program	$15,000	420
A4	Quantity pricing	$0	0
A5	Contractor's pumps	$10,000	48
B1	Alternative land use	$5,000	132
B2	Urban recycled water use	$0	0
B3	Financing of on-farm improvements	$1,500,000	400
B4	Incentive pricing	$0	0
B5	Line or pipe canals/install reservoirs	$340,000	300
B6	Increase delivery flexibility	$640,000	225
B7	District spill/tailwater recovery systems	$200,000	100
B8	Measure outflow	$5,000	135
B9	Optimize conjunctive use	$0	0
B10	Automate canal structures	$36,000	360
B11	Customer pump testing	$8,000	30
B12	Mapping	$6,000	280
	Total	**$2,849,500**	**3655**

3. Projected budget summary for the 3rd year (2025)

Year 3 (2025) BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$15,000	225
A2	Conservation staff	$10,000	1000
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality Agricultural Education Program	$15,000	420
A4	Quantity pricing	$0	0
A5	Contractor's pumps	$10,000	48
B1	Alternative land use	$5,000	132
B2	Urban recycled water use	$0	0
B3	Financing of on-farm improvements	$1,500,000	400
B4	Incentive pricing	$0	0
B5	Line or pipe canals/install reservoirs	$300,000	250
B6	Increase delivery flexibility	$7,715,000	1000
B7	District spill/tailwater recovery systems	$200,000	100
B8	Measure outflow	$5,000	135
B9	Optimize conjunctive use	$200,000	40
B10	Automate canal structures	$50,000	360
B11	Customer pump testing	$8,000	30
B12	Mapping	$6,000	280
	Total	**$10,039,000**	**4420**

4. Projected budget summary for the 4th year (2026)

Year 4 (2026) BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$15,000	225
A2	Conservation staff	$10,000	1000
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality Agricultural Education Program	$15,000	420
A4	Quantity pricing	$0	0
A5	Contractor's pumps	$10,000	48
B1	Alternative land use	$5,000	132
B2	Urban recycled water use	$0	0
B3	Financing of on-farm improvements	$1,500,000	400

Year 4 (2026) BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
B4	Incentive pricing	$0	0
B5	Line or pipe canals/install reservoirs	$300,000	250
B6	Increase delivery flexibility	$6,575,000	500
B7	District spill/tailwater recovery systems	$1,400,000	250
B8	Measure outflow	$5,000	135
B9	Optimize conjunctive use	$0	0
B10	Automate canal structures	$95,000	360
B11	Customer pump testing	$8,000	30
B12	Mapping	$6,000	280
	Total	**$9,944,000**	**4030**

5. Projected budget summary for the 5th year (2027)

Year 5 (2027) BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$15,000	225
A2	Conservation staff	$10,000	1000
A3	On-farm evaluation/water delivery info irrigation Scheduling Water quality Agricultural Education Program	$15,000	420
A4	Quantity pricing	$0	0
A5	Contractor's pumps	$10,000	48
B1	Alternative land use	$5,000	132
B2	Urban recycled water use	$0	0
B3	Financing of on-farm improvements	$1,500,000	400
B4	Incentive pricing	$0	0
B5	Line or pipe canals/install reservoirs	$300,000	250
B6	Increase delivery flexibility	$6,575,000	225
B7	District spill/tailwater recovery systems	$35,000	100
B8	Measure outflow	$5,000	135
B9	Optimize conjunctive use	$200,000	40
B10	Automate canal structures	$50,000	360
B11	Customer pump testing	$8,000	30
B12	Mapping	$6,000	280
	Total	**$8,734,000**	**3645**

– Best Management Practices for Urban Contractors

N/A

A. BMP Compliance Methodology

Describe the methodology selected for BMP compliance: Traditional, Flexible, or GPCD. Provide a description of how water savings is being achieved through the selected methodology.

B. Foundational BMPs

1. Operations Programs

1.1. Operations Practices

A.1) Conservation Coordinator

A.2) Water waste prevention

A.3) Wholesale agency assistance programs

1.2. Water Loss Control

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

1.4. Retail Conservation Pricing

2. Education Programs

1.1. Public Information Programs

1.2. School Education Programs

C. Programmatic BMPs

3. Residential

A.1) Residential assistance program

A.2) Landscape water survey

A.3) High-efficiency clothes washers (HECWs)

A.4) WaterSense Specification (WSS) toilets

A.5) WaterSense Specifications for residential development

4. Commercial, Industrial, and Institutional (CII)

5. Landscape

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

1. The following tables for the traditional methodology, if flexible or GPCD methodology is chosen, adjust the following table accordingly. Amount actually spent during current year

Current Year BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utility Operations		
1.1	Operation Practices	$0	0
1.2	Water Loss Control	$0	0
1.3	Metering	$0	0
1.4	Retail Conservation Pricing	$0	0
2	Educational Programs		
2.1	Public Information Programs	$0	0
2.2	School Educational Programs	$0	0
3	Residential	$0	0
4	CII	$0	0
5	Landscape	$0	0
	Total	**$0**	**0**

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	$0	0
1.2	Water Loss Control	$0	0
1.3	Metering	$0	0
1.4	Retail Conservation Pricing	$0	0
2	Educational Programs		
2.1	Public Information Programs	$0	0
2.2	School Educational Programs	$0	0
3	Residential	$0	0
4	CII	$0	0
5	Landscape	$0	0
	Total	**$0**	**0**

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	$0	0
1.2	Water Loss Control	$0	0
1.3	Metering	$0	0
1.4	Retail Conservation Pricing	$0	0
2	Educational Programs		
2.1	Public Information Programs	$0	0
2.2	School Educational Programs	$0	0
3	Residential	$0	0
4	CII	$0	0
5	Landscape	$0	0
	Total	**$0**	**0**

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	$0	0
1.2	Water Loss Control	$0	0
1.3	Metering	$0	0
1.4	Retail Conservation Pricing	$0	0
2	Educational Programs		
2.1	Public Information Programs	$0	0
2.2	School Educational Programs	$0	0
3	Residential	$0	0
4	CII	$0	0
5	Landscape	$0	0
	Total	**$0**	**0**

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	$0	0
1.2	Water Loss Control	$0	0
1.3	Metering	$0	0
1.4	Retail Conservation Pricing	$0	0
2	Educational Programs		
2.1	Public Information Programs	$0	0
2.2	School Educational Programs	$0	0
3	Residential	$0	0
4	CII	$0	0
5	Landscape	$0	0
	Total	**$0**	**0**

Addendum C - ***Information Required of Contractors Located in a Drainage Problem Area***

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), are listed by subarea below. If future editions of the drainage report revise the boundaries of a drainage problem area or other factors used to determine which districts are in a drainage problem area, Reclamation will revise Attachment A to conform with the current drainage report.

1. Reclamation districts in the Grasslands sub area: Central California Irrigation District, Del Puerto Water District, Firebaugh Canal Water District, Mercy Springs Water District, Pacheco Water District, Panoche Water District, San Luis Canal Company, and San Luis Water District.

2. Reclamation districts in the Westlands sub area: James Irrigation District, Tranquillity Irrigation District, and Westlands Water District.

3. Reclamation districts in the Tulare Sub area: Alpaugh Irrigation District, Atwell Island Water District, Lower Tule River Irrigation District, and Pixley Irrigation District.

4. Reclamation districts in the Kern sub area: Alpaugh Irrigation District.

Districts listed above shall describe which recommendations prescribed in A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley (September 1990) have been incorporated in their water conservation programs to improve conditions in drainage problem areas. Provide a description and level of expenditure for each activity designed to address the recommendations of the San Joaquin Valley Drainage Program. Identify how implementation of the recommendations has or will substantially reduce deep percolation on drainage problem lands. Describe which recommendations have not been implemented and why.
These recommendations include:

1. Source Control

A drainage reduction program is in place in combination with the On-farm water conservation program. Farmers are being incentivized to convert from flood irrigation to drip irrigation to reduce surface runoff and deep percolation below the crop's root zone. At this time, more than 19,000 acres (approximately 50% of the irrigable acres) have been converted from flood irrigation to subsurface drip irrigation.

SLCC prepared a seepage reduction program through different practices.
The company performed several seepage measurements to determine actual seepage losses and to prioritize which canals and laterals are good candidates to be lined.

- Geomembrane + concrete lining
- Concrete Canvas CCX-M
- Concrete lining
- In-situ soil compaction for the adequate soil conditions.
- Bentonite barriers are occasionally used when seepage is present, and the irrigation season has already started.
- PAM was occasionally used when seepage is present, and the irrigation season has already started.
- Heavy chaining is occasionally used when seepage is present, and the irrigation season has already started.

2. Land Retirement

No permanent land retirement is anticipated at this time in our area. It is the staff's belief that more efficient irrigation application methods and practices in combination with tail water drainage reductions will avoid the necessity for land retirement.
The company has two rotational fallowing programs in place that allow farmers to be compensated for transferring water that would have been consumptively used on those lands, reducing deep percolation on drainage problem lands.

3. Drainage Water Treatment

No drainage water treatment is necessary at this time in our area.

4. Drainage Water Reuse

Some drainage and subsurface water is put back into the system and co-mingled with surface water for Agricultural use.

5. Shallow Ground Water Pumping

The company has 16 tileline pumps in an area that has historic shallow ground water and pumping is required to drop ground water table to a proper depth to allow suitable crop growth.

6. Evaporation Ponds

There are no evaporation ponds within the service area.

Section IV

District Water Inventory Tables

Year of Data 2023 **Enter data year here**

Table 1

Surface Water Supply

2023 Month	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (define) (acre-feet)	Other Water Low Lift (acre-feet)	Transfers into District (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
Method	M1				M1		M1	
January	0	0	0	0	3,095	0	937	4,032
February	0	0	0	0	3,975	0	1,537	5,512
March	5,288	0	0	0	6,290	0	2,138	13,716
April	5,648	0	0	0	2,442	0	1,461	9,551
May	10,335	0	0	0	4,921	0	2,467	17,723
June	18,921	0	0	0	6,408	0	3,538	28,867
July	26,192	0	0	0	7,661	0	3,678	37,531
August	21,683	0	0	0	6,555	0	3,498	31,736
September	12,423	0	0	0	5,090	0	2,478	19,991
October	9,196	0	0	0	4,413	0	3,062	16,671
November	2,829	0	0	0	4,864	0	3,111	10,804
December	2,100	0	0	0	1,396	0	2,769	6,265
TOTAL	114,615	0	0	0	57,110	0	30,674	202,399

Table 2

Ground Water Supply

2023 Month	District Groundwate (acre-feet)	Private Agric *(acre-feet)
Method	M1	M1
January	11	13
February	0	128
March	75	20
April	113	17
May	673	430
June	1,166	232
July	1,023	386
August	559	578
September	93	446
October	116	47
November	17	71
December	869	318
TOTAL	4,715	2,686

Table 3

Total Water Supply

2023 Month	Surface Water Total (acre-feet)	District Groundwate (acre-feet)	Recycled M&I (acre-feet)	Total District (acre-feet)
Method	M1	M1		
January	4,032	11	0	4,043
February	5,512	0	0	5,512
March	13,716	75	0	13,791
April	9,551	113	0	9,664
May	17,723	673	0	18,396
June	28,867	1,166	0	30,033
July	37,531	1,023	0	38,554
August	31,736	559	0	32,295
September	19,991	93	0	20,084
October	16,671	116	0	16,787
November	10,804	17	0	10,821
December	6,265	869	0	7,134
TOTAL	202,399	4,715	0	207,114

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

Precipitation Worksheet					Evaporation Worksheet			
2023	inches precip	ft precip	acres	AF/Year	2023	inches evap	ft evap	acres
Jan	5.40	0.45	137.27	168.96	Jan	1.09	0.09	137.27
Feb	1.69	0.14	47.87	58.92	Feb	1.62	0.14	47.87
Mar	4.06	0.34	23.78	29.27	Mar	2.39	0.20	23.78
Apr	0.00	0.00	42.98	52.90	Apr	4.50	0.38	42.98
May	0.50	0.04	38.20	47.02	May	5.72	0.48	38.20
Jun	0.04	0.00	20.67	25.44	Jun	6.60	0.55	20.67
Jul	0.00	0.00	25.00	30.78	Jul	8.02	0.67	25.00
Aug	0.14	0.01	19.39	23.86	Aug	6.75	0.56	19.39
Sept	0.00	0.00	69.42	85.45	Sept	4.88	0.41	69.42
Oct	0.04	0.00	112.51	138.48	Oct	3.38	0.28	112.51
Nov	0.85	0.07	84.55	104.07	Nov	1.83	0.15	84.55
Dec	2.05	0.17	621.64	106.20	Dec	1.08	0.09	621.64
TOTAL	**14.77**	**1.23**			**TOTAL**	**47.86**	**3.99**	

Table 4

Agricultural Distribution System

2023 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)
Arroyo Canal	90,600	66	5,979,600	169.0	547.5	6,463	5,750	(12,592)
Temple Santa Rita	56,354	37	2,085,098	58.9	190.9	0	2,250	(2,382)
San Juan Canal	51,800	20	1,036,000	29.3	94.9	0	450	(516)
Delta Canal	50,600	37	1,872,200	52.9	171.4	0	2,150	(2,269)
Midway Canal	41,600	40	1,664,000	47.0	152.4	2,592	880	(3,577)
San Pedro Canal	36,010	25	900,250	25.4	82.4	1,581	1,065	(2,703)
Lone Tree Canal	32,035	34	1,089,190	30.8	99.7	2,590	850	(3,509)
Delta No.1 Canal	35,191	24	844,584	23.9	77.3	0	265	(318)
Others	72,000	42	3,024,000	85.4	276.9	200	2,500	(2,891)
Laterals	408,400	12	4,900,800	138.5	448.7	100	4,000	(4,410)
Reservoirs	0	0	3,683,000	104.1	337.2	0	3,000	(3,233)
TOTAL			622	765.1	2,479.3	13,526	23,160	(38,400)

Table 5

Crop Water Needs

2023 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requiremen (AF/Ac)	Cultural Practices (AF/Ac)	Effective Precipitatio (AF/Ac)	Appl. Crop Water Use (acre-feet)
TOMATOES	9,884	2.34	0.2	1.0	0.0	34,632
COTTON	8,397	3.11	0.3	0.6	0.0	33,503
WHEAT	7,322	1.50	0.2	0.0	0.4	9,153
CORN	4,840	3.00	0.2	0.8	0.0	18,963
ALFALFA	4,008	4.50	0.2	1.0	0.4	21,162
IDLE / FALLOW	3,571	0.00	0.0	0.0	0.0	0
ALMONDS	2,865	3.79	0.3	0.3	0.1	12,191
MELONS	1,227	1.53	0.1	0.3	0.0	2,339
WILDLIFE REFU(	1,877	2.50	0.1	0.0	0.4	4,129
OATS	1,076	1.50	0.1	0.0	0.4	1,329
PISTACHIOS	846	3.26	0.3	0.3	0.1	3,148
GARLIC	827	1.87	0.1	0.0	0.2	1,458
PASTURE	821	3.00	0.5	0.0	0.4	2,504
ONIONS	545	1.87	0.1	0.0	0.2	961
WATERMELONS	480	1.70	0.1	0.3	0.0	1,001
CARROTS	382	1.70	0.1	0.0	0.4	527
NATIVE GRASS S	275	2.00	0.1	0.0	0.4	462
SORGUM - SUDA	178	2.00	0.2	0.5	0.0	473
OTHERS	584	2.50	0.2	0.5	0.2	1,752
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
Crop Acres	50,005					149,688

Total Irrig. Acres 40,012 (If this number is larger than your known total, it may be due to double cropping)

Table 6

2023 District Water Inventory

Type of Water	Location of Information		
Water Supply	Table 3		207,114
Riparian ET	(Distribution and Drain)	minus	7,500
Groundwater recharge	intentional - ponds, injection	minus	0
Seepage	Table 4	minus	23,160
Evaporation - Precipitation	Table 4	minus	1,714
Spillage	Table 4	minus	13,526
Transfers out of District		minus	39,209
Water Available for sale to customers			122,005
Actual Agricultural Water Sales 2023	From District Sales Records		109,869
Private Groundwater	Table 2	plus	2,686
Crop Water Needs	Table 5	minus	149,688
Drainwater outflow	(tail and tile, not recycled)	minus	45,750
Percolation from Agricultural Land	(calculated)		(82,883)
Unaccounted for Water	(calculated)		12,136

Table 7

Influence on Groundwater and Saline Sink

2023	
Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence	64,195
Estimated actual change in ground water storage, including natural recharge)	17,000
Irrigated Acres (from Table 5)	50,005
Irrigated acres over a perched water table	9,950
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	(16,492)
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	(16,492)

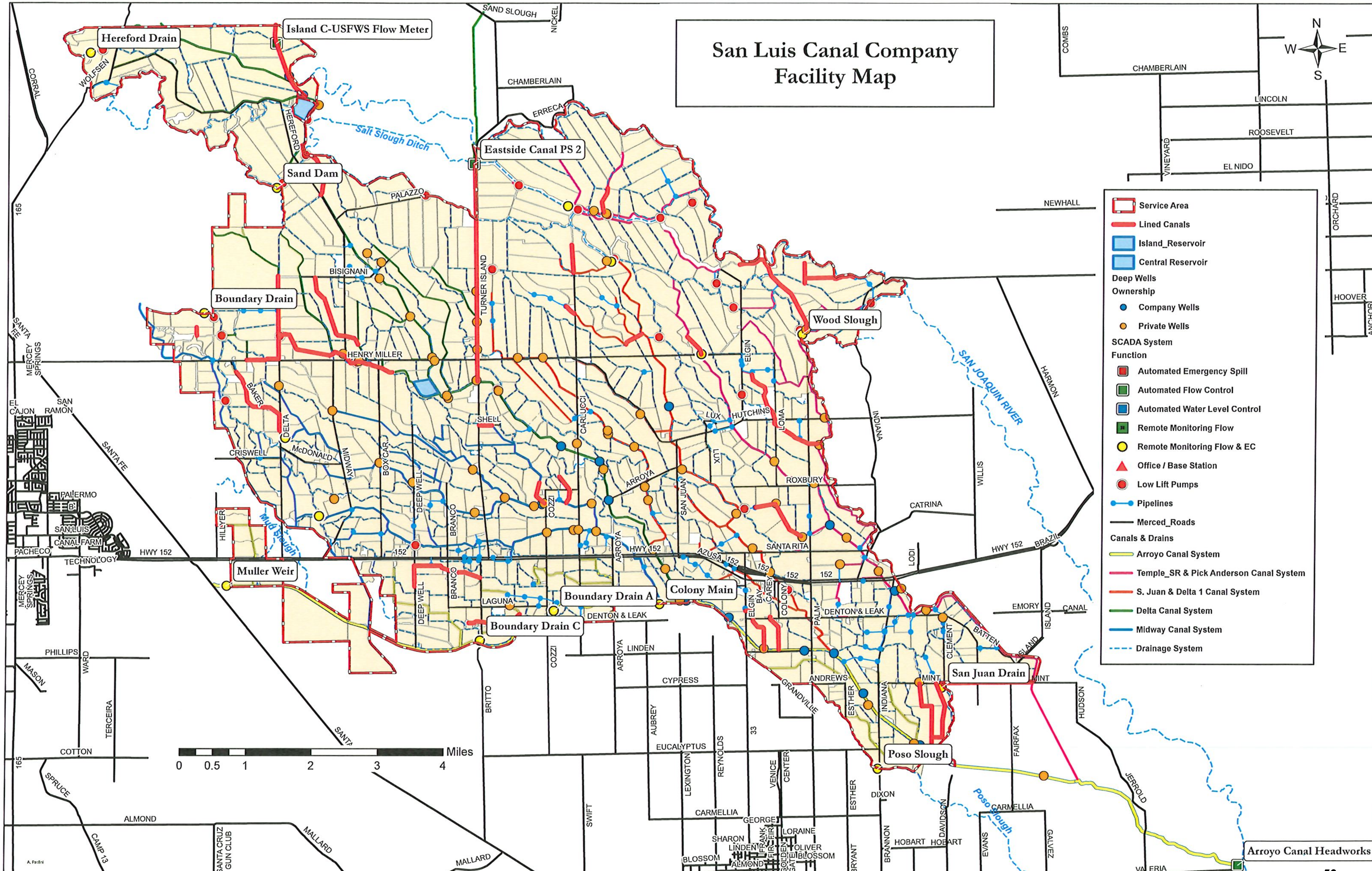
Table 8

Annual Water Quantities Delivered Under Each Right or Contract

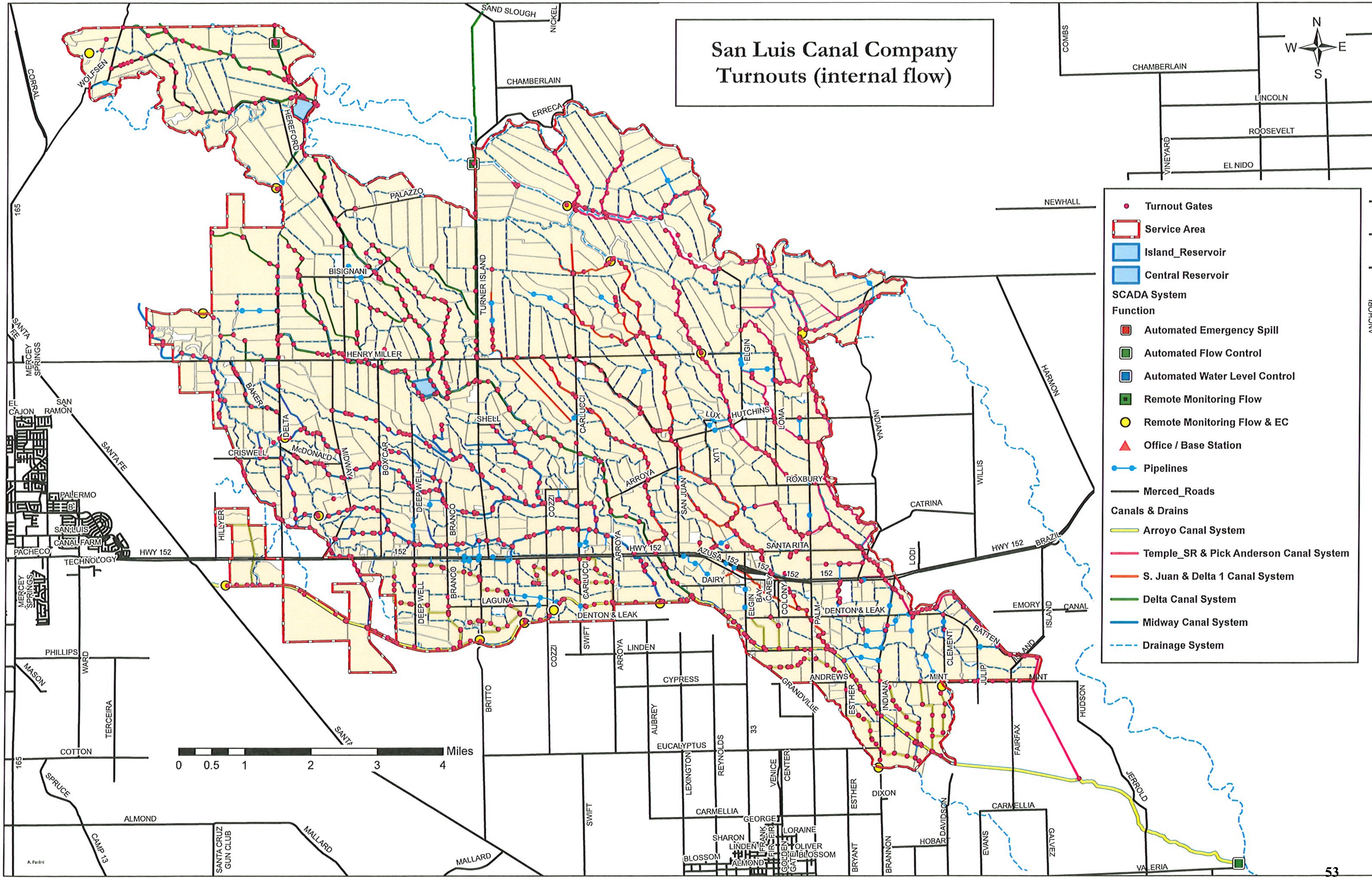
Year	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (define) (acre-feet)	Other Water Low (acre-feet)	Transfers into District (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
2014	102,847	0	0	0	26,530	0	15,945	145,322
2015	80,766	0	0	0	26,440	0	12,819	120,025
2016	115,590	0	0	0	37,385	0	11,965	164,940
2017	129,724	0	0	0	42,276	0	25,004	197,004
2018	121,932	0	0	0	49,330	0	22,843	194,105
2019	123,552	0	0	0	46,018	0	33,769	203,339
2020	112,185	0	0	0	51,459	0	33,473	197,117
2021	120,284	0	0	0	34,773	0	22,480	177,537
2022	112,711	0	0	0	46,686	0	20,138	179,535
2023	114,615	0	0	0	57,110	0	30,674	202,399
Total	1,134,206	0	0	0	418,007	0	229,110	1,781,323
Average	113,421	0	0	0	41,801	0	22,911	178,132

Attachment A

Company Maps



San Luis Canal Company
Facility Map
N
W
E
S
Hereford Drain
Island C-USFWS Flow Meter
Eastside Canal PS 2
Sand Dam
Boundary Drain
Wood Slough
Muller Weir
Boundary Drain A
Colony Main
Boundary Drain C
San Juan Drain
Poso Slough
Arroyo Canal Headworks
Salt Slough Ditch
Mud Slough
SAN JOAQUIN RIVER
Poso Slough
Service Area
Lined Canals
Island_Reservoir
Central Reservoir
Deep Wells
Ownership
Company Wells
Private Wells
SCADA System
Function
Automated Emergency Spill
Automated Flow Control
Automated Water Level Control
Remote Monitoring Flow
Remote Monitoring Flow & EC
Office / Base Station
Low Lift Pumps
Pipelines
Merced_Roads
Canals & Drains
Arroyo Canal System
Temple_SR & Pick Anderson Canal System
S. Juan & Delta 1 Canal System
Delta Canal System
Midway Canal System
Drainage System
Miles
0
0.5
1
2
3
4
HWY 152
HENRY MILLER
SANTA FE
TURNER ISLAND
CHAMBERLAIN
SAND SLOUGH
NICKEL
CORRAL
WOLFSEN
HEREFORD
ERRECA
PALAZZO
BISIGNANI
MERCEY SPRINGS
EL CAJON
SAN RAMON
CRISWELL
BAKER
DELTA
McDONALD
MIDWAY
BOXCAR
DEEP WELL
BRANCO
SHELL
CARLUCCI
ARROYA
COZZI
SAN JUAN
LUX
HUTCHINS
LOMA
ELGIN
ROXBURY
SANTA RITA
AZUSA
INDIANA
CATRINA
LODI
WILLIS
HARMON
BRAZIL
EMORY
ISLAND
CANAL
PALERMO
SAN LUIS
CANAL FARM
PACHECO
TECHNOLOGY
HILLYER
LAGUNA
DENTON & LEAK
LINDEN
CYPRESS
ANDREWS
GRANDVILLE
ESTHER
MINT
CLEMENT
BATTEN
PALM
COLONY
CAREY
BAY
PHILLIPS
WARD
MASON
TERCEIRA
COTTON
SPRUCE
ALMOND
CAMP 13
SANTA CRUZ GUN CLUB
MALLARD
BRITTO
SWIFT
AUBREY
EUCALYPTUS
LEXINGTON
REYNOLDS
VENICE
CENTER
CARMELLIA
GEORGE
LORAINE
SHARON
OLIVER
BLOSSOM
BRYANT
BRANNON
DIXON
HOBART
DAVIDSON
EVANS
GALVEZ
FAIRFAX
HUDSON
JERROLD
VALERIA
COMBS
LINCOLN
ROOSEVELT
VINEYARD
EL NIDO
NEWHALL
ORCHARD
HOOVER
ANCHOR
A. Pacini


San Luis Canal Company
Turnouts (internal flow)
Turnout Gates
Service Area
Island_Reservoir
Central Reservoir
SCADA System
Function
Automated Emergency Spill
Automated Flow Control
Automated Water Level Control
Remote Monitoring Flow
Remote Monitoring Flow & EC
Office / Base Station
Pipelines
Merced_Roads
Canals & Drains
Arroyo Canal System
Temple_SR & Pick Anderson Canal System
S. Juan & Delta 1 Canal System
Delta Canal System
Midway Canal System
Drainage System
0 0.5 1 2 3 4 Miles
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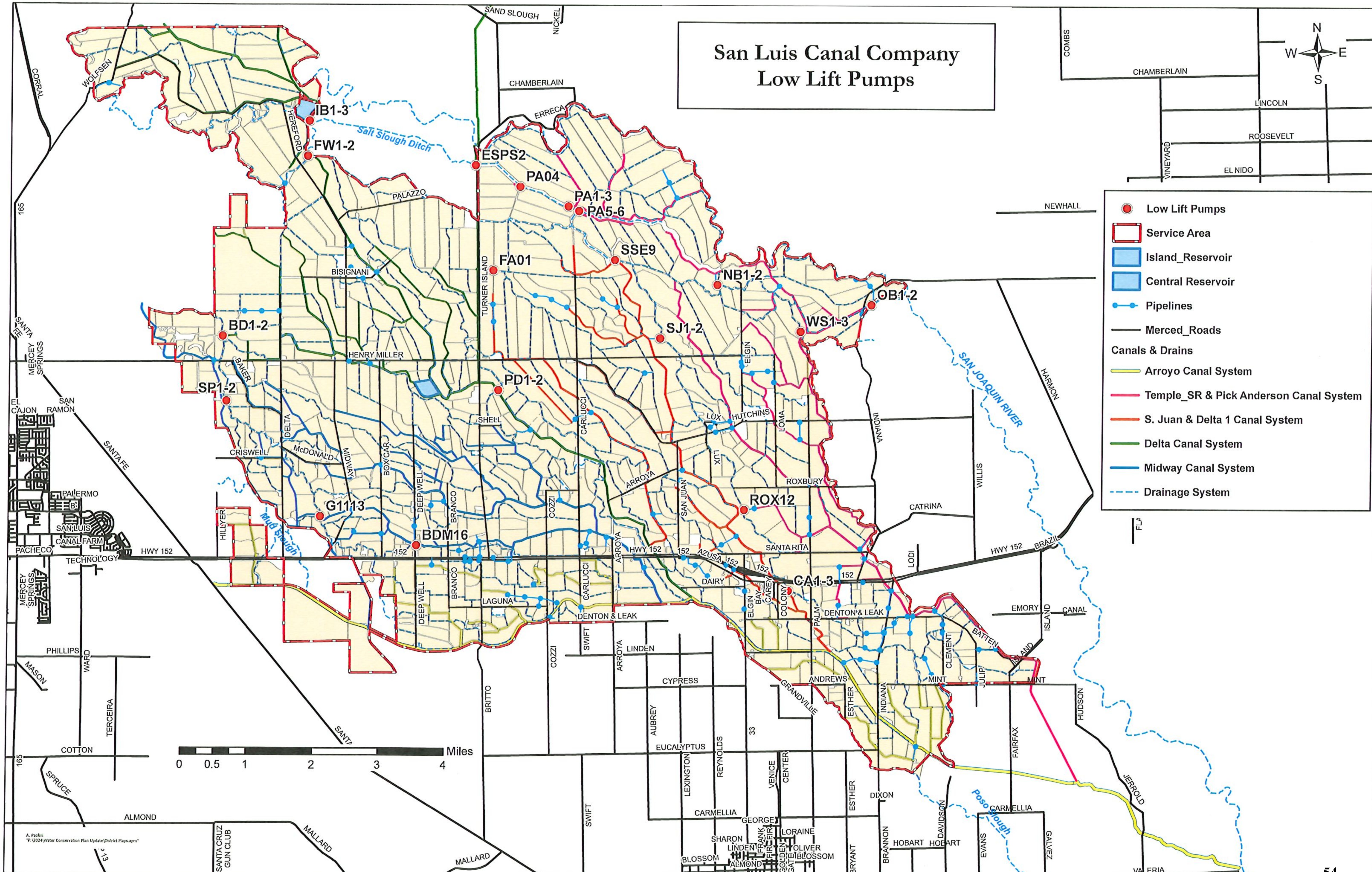
San Luis Canal Company
Low Lift Pumps
N
S
E
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Low Lift Pumps
Service Area
Island_Reservoir
Central Reservoir
Pipelines
Merced_Roads
Canals & Drains
Arroyo Canal System
Temple_SR & Pick Anderson Canal System
S. Juan & Delta 1 Canal System
Delta Canal System
Midway Canal System
Drainage System
IB1-3
FW1-2
ESPS2
PA04
PA1-3
PA5-6
SSE9
FA01
NB1-2
OB1-2
WS1-3
SJ1-2
BD1-2
SP1-2
PD1-2
ROX12
G1113
BDM16
CA1-3
Salt Slough Ditch
Mud Slough
SAN JOAQUIN RIVER
Poso Slough
SAND SLOUGH
0 0.5 1 2 3 4 Miles
A. Paolini
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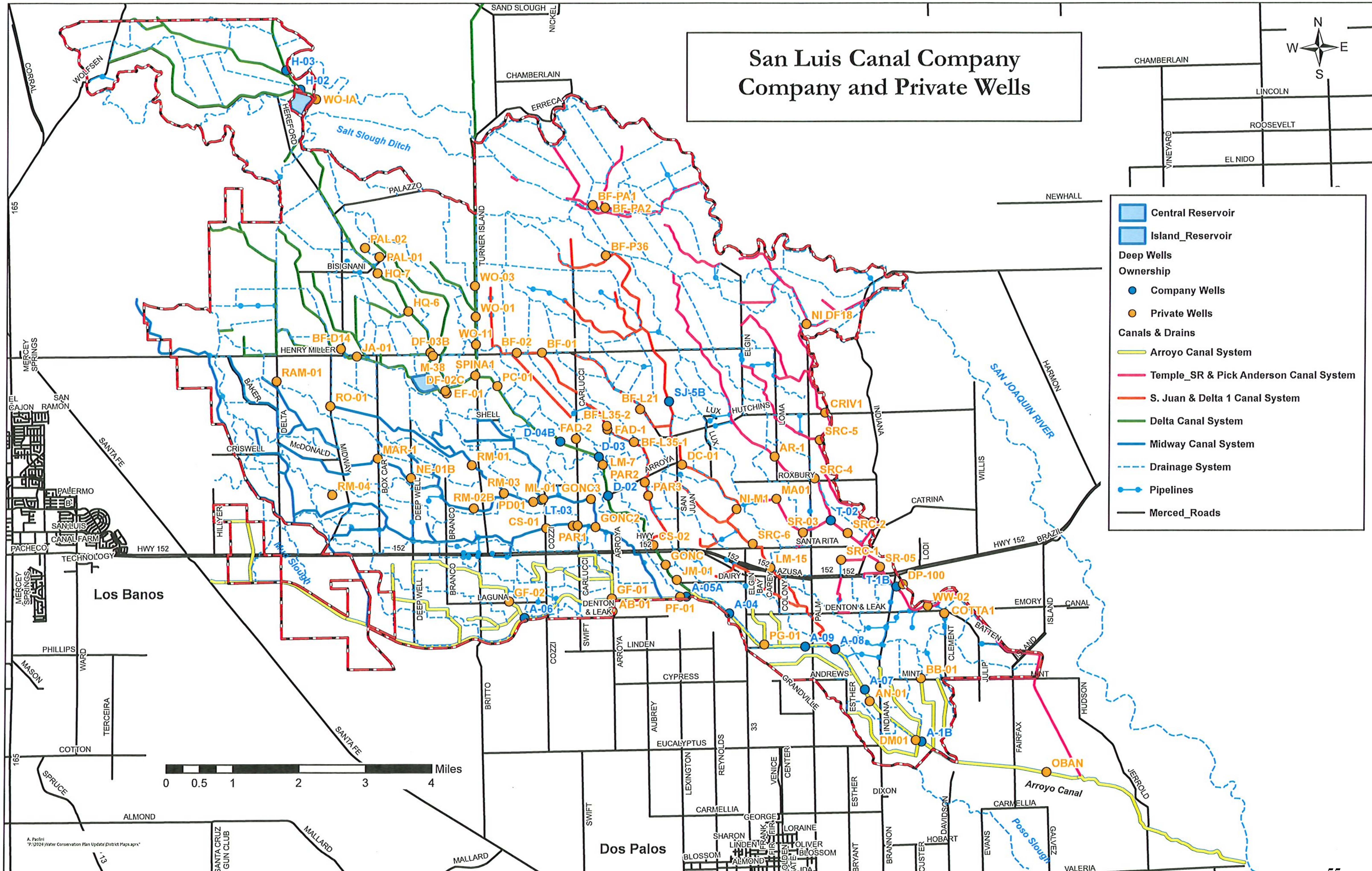
San Luis Canal Company
Company and Private Wells
Central Reservoir
Island_Reservoir
Deep Wells
Ownership
Company Wells
Private Wells
Canals & Drains
Arroyo Canal System
Temple_SR & Pick Anderson Canal System
S. Juan & Delta 1 Canal System
Delta Canal System
Midway Canal System
Drainage System
Pipelines
Merced_Roads
N
W
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Miles
0 0.5 1 2 3 4
Salt Slough Ditch
San Joaquin River
Mud Slough
Arroyo Canal
Poso Slough
Los Banos
Dos Palos
H-03
H-02
WO-IA
BF-PA1
BF-PA2
BF-P36
PAL-02
PAL-01
HQ-7
HQ-6
WO-03
WO-01
WO-11
BF-D14
JA-01
DF-03B
M-38
DF-02C
EF-01
SPINA1
PC-01
BF-02
BF-01
RAM-01
RO-01
NI DF18
SJ-5B
BF-L21
BF-L35-2
FAD-2
FAD-1
BF-L35-1
D-04B
D-03
LM-7
PAR2
PAR3
DC-01
D-02
CRIV1
SRC-5
AR-1
SRC-4
MA01
NI-M1
MAR-1
NE-01B
RM-01
RM-04
RM-03
RM-02B
ML-01
GONC3
PD01
LT-03
CS-01
PAR1
GONC2
CS-02
SR-03
T-02
SRC-2
SRC-6
SRC-1
SR-05
LM-15
GONC
JM-01
A-05A
DP-100
T-1B
WW-02
COTTA1
GF-02
GF-01
A-06
AB-01
PF-01
A-04
PG-01
A-09
A-08
BB-01
A-07
AN-01
A-1B
DM01
OBAN
SAND SLOUGH
NICKEL
CHAMBERLAIN
ERRECA
LINCOLN
ROOSEVELT
EL NIDO
VINEYARD
NEWHALL
WOLFSEN
CORRAL
HEREFORD
PALAZZO
TURNER ISLAND
BISIGNANI
HENRY MILLER
MERCEY SPRINGS
SAN RAMON
EL CAJON
SANTA FE
CRISWELL
McDONALD
MIDWAY
BAKER
DELTA
SHELL
CARLUCCI
LUX
HUTCHINS
LOMA
ELGIN
INDIANA
HARMON
WILLIS
ROXBURY
CATRINA
SAN JUAN
ARROYA
SANTA RITA
HWY 152
BRAZIL
LODI
PALERMO
SAN LUIS CANAL FARM
PACHECO
TECHNOLOGY
HILLYER
BOX CAR
DEEP WELL
BRANCO
COZZI
LAGUNA
DENTON & LEAK
DAIRY
AZUSA
BAY
CAREY
COLONY
PALM
EMORY
CANAL
ISLAND
BATTEN
CLEMENT
SWIFT
LINDEN
CYPRESS
AUBREY
ANDREWS
GRANDVILLE
ESTHER
MINT
JULIP
HUDSON
FAIRFAX
JERROLD
PHILLIPS
MASON
WARD
TERCEIRA
COTTON
SPRUCE
BRITTO
EUCALYPTUS
LEXINGTON
REYNOLDS
VENICE
CENTER
DIXON
CARMELLIA
DAVIDSON
GEORGE
LORAINE
SHARON
FRANK
OLIVER
BLOSSOM
ALMOND
GOLDEN GATE
IDA
BRYANT
BRANNON
CUSTER
HOBART
EVANS
GALVEZ
VALERIA
ALMOND
MALLARD
SANTA CRUZ GUN CLUB
A. Paolini
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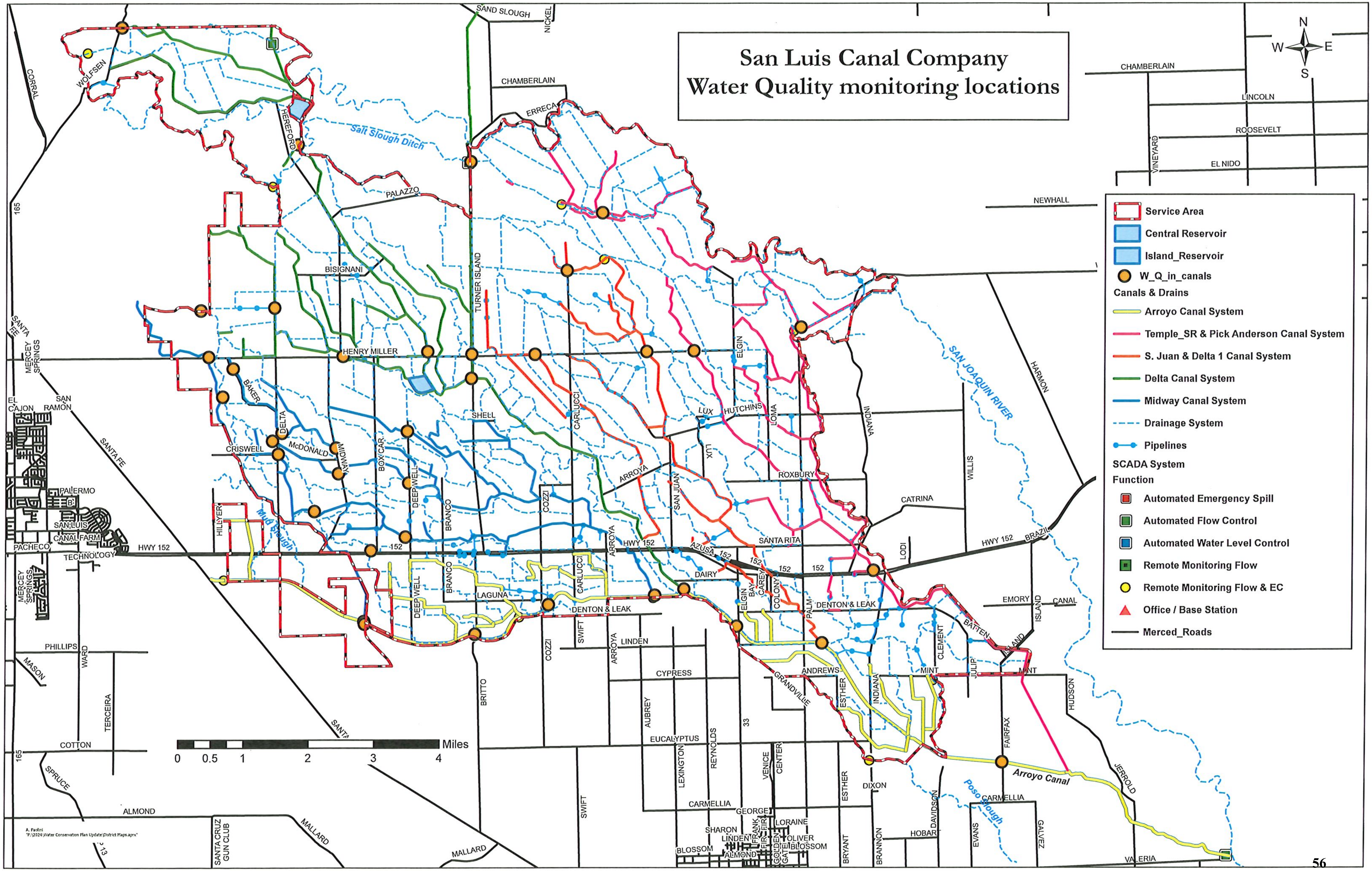
San Luis Canal Company
Water Quality monitoring locations
N
W
E
S
Service Area
Central Reservoir
Island_Reservoir
W_Q_in_canals
Canals & Drains
Arroyo Canal System
Temple_SR & Pick Anderson Canal System
S. Juan & Delta 1 Canal System
Delta Canal System
Midway Canal System
Drainage System
Pipelines
SCADA System
Function
Automated Emergency Spill
Automated Flow Control
Automated Water Level Control
Remote Monitoring Flow
Remote Monitoring Flow & EC
Office / Base Station
Merced_Roads
Salt Slough Ditch
SAN JOAQUIN RIVER
Mud Slough
Poso Slough
Arroyo Canal
SAND SLOUGH
NICKEL
CHAMBERLAIN
LINCOLN
ROOSEVELT
EL NIDO
VINEYARD
NEWHALL
ERRECA
PALAZZO
HEREFORD
WOLFSEN
CORRAL
BISIGNANI
TURNER ISLAND
HENRY MILLER
SHELL
CARLUCCI
LUX
HUTCHINS
LOMA
ELGIN
INDIANA
HARMON
WILLIS
CATRINA
ROXBURY
ARROYA
SAN JUAN
SANTA RITA
AZUSA
HWY 152
BRAZIL
LODI
EMORY
CANAL
ISLAND
BATTEN
DENTON & LEAK
DAIRY
LAGUNA
DEEP WELL
BRANCO
COZZI
SWIFT
LINDEN
CYPRESS
AUBREY
EUCALYPTUS
REYNOLDS
LEXINGTON
VENICE
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SHARON
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ESTHER
BRYANT
DIXON
BRANNON
DAVIDSON
HOBART
EVANS
GALVEZ
FAIRFAX
JERROLD
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VALERIA
ANDREWS
GRANDVILLE
MINT
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JULIP
PALM
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DELTA
CRISWELL
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MIDWAY
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SANTA FE
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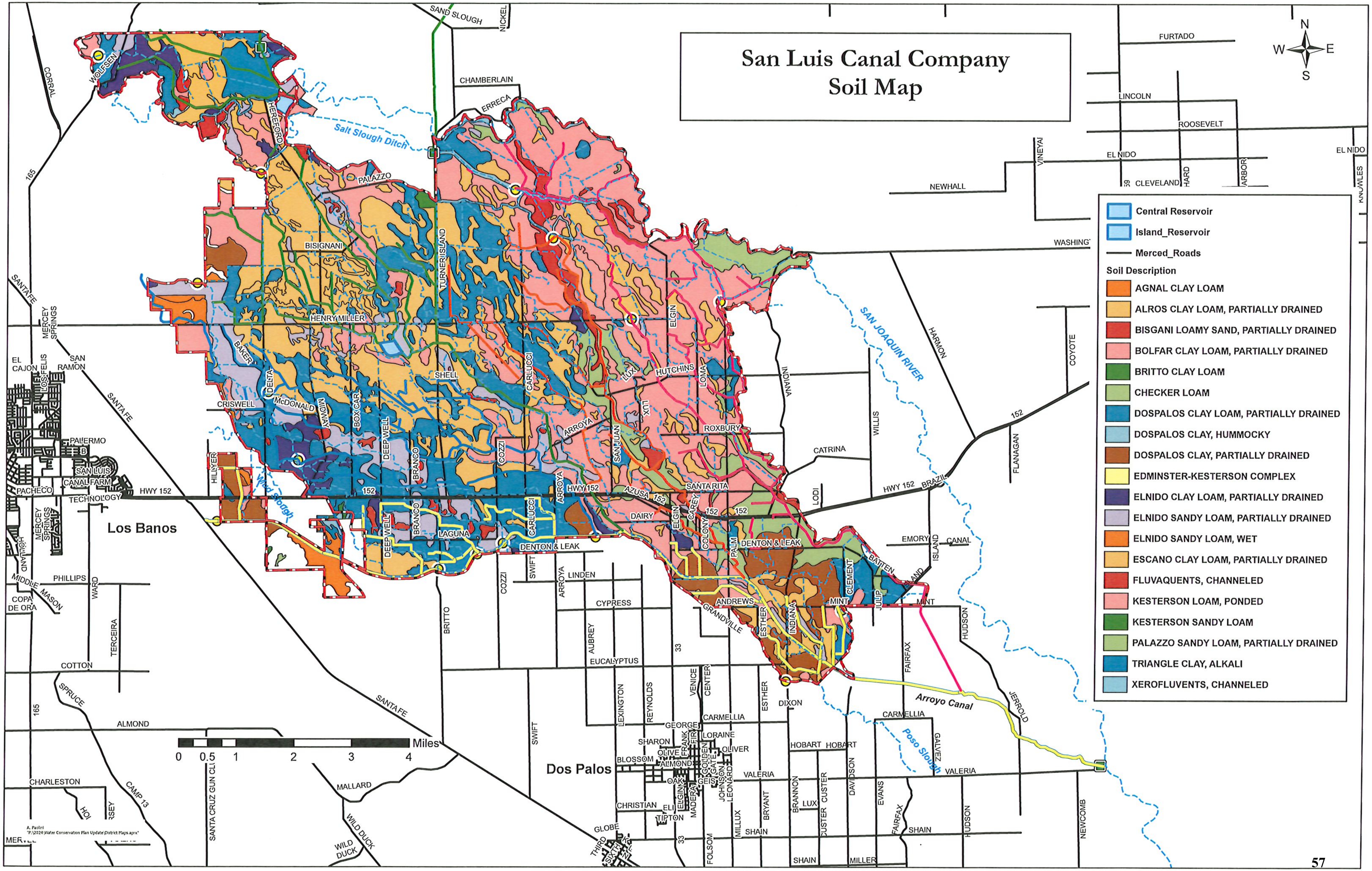
San Luis Canal Company
Soil Map
Central Reservoir
Island_Reservoir
Merced_Roads
Soil Description
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BRITTO CLAY LOAM
CHECKER LOAM
DOSPALOS CLAY LOAM, PARTIALLY DRAINED
DOSPALOS CLAY, HUMMOCKY
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ELNIDO SANDY LOAM, WET
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SAN JOAQUIN RIVER
Arroyo Canal
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HWY 152

Attachment B

Company Rules and Regulations

Transfer Policies

RULES AND REGULATIONS
SAN LUIS CANAL COMPANY

Governing the Distribution and Use of Water

Adopted by the Board of Directors of the
San Luis Canal Company at the
Regular Meeting held on May 18, 1978

Revised: June 28, 2007

The San Luis Canal Company (hereinafter the "COMPANY") is a Corporation, organized and existing under and by virtue of the laws of the State of California. It is a Mutual Water company governed by a Board of Directors (hereinafter "Board") elected by the Shareholder. It is operated for the sole benefit of the lands within its boundaries, and the benefits the Shareholder can derive from the COMPANY will be enhanced by the extent to which they cooperate to make it a success.

These Rules and Regulations are consistent with the laws of California and have been adopted by the Board pursuant to the COMPANY's Articles of Incorporation and Bylaws to effect orderly and efficient distribution and use of the COMPANY's water supply; to effect adequate and uniform drainage of the lands within the boundaries of the COMPANY; to cooperate to the extent determined to be proper, at the absolute discretion of the Board, with land owners within the boundaries of the COMPANY in reducing high ground water tables; and to govern the collection of the charges and expenses incident to the COMPANY's business.

Rule 1

MANAGEMENT

The business of the COMPANY is controlled by the Board as provided by the Bylaws.

The Company shall engage such agencies as may, from time to time, be required for the provision of operations, maintenance and improvement of the system.

It is the policy of the COMPANY and the Board that the general management of its business shall be delegated to the COMPANY's General Manager.

Rule 2

CONTROL OF WORKS

All diversion works, canals, ditches, headgates, drains, siphons, spillways, and other structures once owned by the COMPANY, and having been transferred to Henry Miller Reclamation District #2131 (DISTRICT), shall be operated and maintained by the DISTRICT in conference with standards acceptable to COMPANY and negotiated with DISTRICT, provided that such standards shall, at all times, be in conformity with all Federal, State, and local law.

It shall be a general rule of the COMPANY to provide and maintain one turnout gate for each forty (40) acres of land under one ownership contiguous to a canal. In cases of long, narrow fields, however, the

COMPANY may, at its option, provide and maintain turnout gates at intervals of 600 to 1,000 feet, and in the cases of a parcel of land in one ownership that is smaller in size than the area referred to above, the COMPANY may provide and maintain one turnout gate for such smaller parcel, excepting when it is feasible to irrigate such parcel from an existing turnout located upstream there-from. In no event, however, will the COMPANY provide and/or maintain turnouts at its expense in canals that are not owned and/or controlled by the COMPANY.

Rule 3

LIABILITY FOR DAMAGE

The COMPANY shall not be liable for any damage caused by the negligence or carelessness of any Shareholder in the use of water or for failure on Shareholders part to maintain any ditch or structure therein for which he is responsible, either in whole or in part.

Rule 4

TRESPASS ON COMPANY PROPERTY

Any Shareholder or any other individual entering upon COMPANY property does so at his own risk.

Rule 5

APPLICATION FOR WATER

The "SECOND AMENDED CONTRACT FOR EXCHANGE OF WATERS" states, among other things, "The Contracting Entities (COMPANY being one of the Entities) shall furnish estimates of their aggregate monthly delivery requirements and their daily delivery schedules for each weekly period, which shall be submitted to the United States at least 48 hours prior to the beginning of the delivery period."

Since the delivery schedule hereinabove referred to pertains to water delivered into Mendota Pool and not into the COMPANY's or DISTRICT's canal system, Shareholder and/or their tenants shall be required to apply for water at least twenty-four hours in advance of the date for which water is requested. Water will be delivered on requests made less than twenty-four hours provided such water is available and deliveries can be made without interference with other users and without undue waste of water or undue manipulation of weirs and gates.

Rule 6

ALLOCATION OF WATER

1. Entitlement

a. The amount of water that each owner of the capital stock of the COMPANY will receive shall be the proportion of the total water available to the COMPANY from all sources that the stock owned by

Shareholder bears to the total number of shares of stock issued and outstanding. Any Shareholder owning more than one parcel of land in the COMPANY service area may use the full entitlement of water on such parcels as the owner may desire, subject to a like right of all other Shareholder, and provided that the canal or canals used in transporting said water have the necessary carrying capacity.

b. When the entitlement is inconsistent with production of a practicable head of water on a daily basis, allocations shall be made on a per acre-foot per month basis in the proportion that the stock owned by the Shareholder bears to the total number of shares issued and outstanding.

2. <u>Limitations</u>

a. COMPANY reserves the right to suspend service during any period of time when it is necessary to take water out of the canals for cleaning, maintenance, repair, or construction work by the Company and its designate.

b. The Board may:

(1) Set an annual allocation of entitlement to water, which shall be based on the prorate share of each Shareholder of the COMPANY, in waters available to COMPANY, which allocation may be modified from time to time during the year as conditions warrant:

(2) Provide for the payment of a reasonable amount for all water received by Shareholder in excess of the yearly entitlement of the Shareholder;

(3) Provide for a measured rate for water deliveries by the COMPANY; and

(4) Arrange for normal or emergency delivery of water outside the service area of the COMPANY consistent with the provisions of all applicable laws and COMPANY policies.

Rule 7

METHOD OF DELIVERY

Water will be delivered in turn within private ditch areas beginning at the head thereof. Any Shareholder not able to use water in his regular turn on any run may receive water upon the completion of the delivery in his private ditch, provided no undue loss of water is involved and there is no interference with deliveries to other Shareholders.

Heads of water applied for may be altered by the COMPANY when necessary.

Shareholder will be required to use water continuously day and night consistent with normal irrigation practices until irrigation is completed and without waste at any time.

Shareholders who require a water supply in short intervals less than 24 hours may do so as long as it is done efficiently and the operational flexibility of the COMPANY or DISTRICT permits such use.

Rule 8

WASTE OF WATER

Shareholder wasting water, either willfully, carelessly, or on account of defective or inadequate ditches, levees, or structures, or on account of inadequate preparation of land for irrigation, may be refused further service until such conditions are remedied.

Rule 9

POINT OF DELIVERY

All measurements and deliveries of water shall be made at the point where the Shareholder's private ditch connects with the canal or ditch owned or controlled by the DISTRICT.

Rule 10

UNAUTHORIZED TAKING OF WATER

Persons interfering with the regulation of water in canals or ditches of the DISTRICT are liable to criminal prosecution. If any person takes water without permission of the authorized agents of the COMPANY, he shall not only be subject to criminal prosecution, but may, at the option of the COMPANY, be subject to forfeiture of his right to water on the next rotation or regular run of water.

Rule 11

OWNERSHIP OF WATER

All water in DISTRICT canals, drains, or ditches, regardless of source, except privately owned well water being transported therein by permission of the COMPANY, is COMPANY water and is subject to diversion and use by the COMPANY for the benefit of it's Shareholder.

Rule 12

ACCESS TO LAND

The authorized agents or employees of the COMPANY and DISTRICT shall have free access at all times to all lands irrigated from the DISTRICT system for the purpose of examining any ditches, laterals, or drains serving such lands and/or the flow of water therein, for the purpose of ascertaining the acreage of crops on lands irrigated or to be irrigated, or for any other COMPANY purpose.

Rule 13

NUISANCES

No material or substance of any nature, and particularly those that are or may become offensive to the senses or injurious to health or may affect the quality of water, obstruct the flow of water, or result in the scattering of seeds or noxious weeds, plants, or grasses, shall be placed or dumped in any canal, ditch, or right-of-way of the DISTRICT . Nor Shall such material or substance shall also not be placed or left so as to roll, slide, flow, or be washed or blown into any canal, ditch, or right-of-way. Any violation of this rule may subject the offender to criminal prosecution. All authorized agents or employees of the COMPANY and DISTRICT shall promptly report any violation of this rule, and the Shareholders of the COMPANY are especially urged to cooperate in its enforcement.

Rule 14

LIVESTOCK WATER

The COMPANY shall not be required to furnish water for the exclusive purpose of providing drinking water to any and all livestock.

Rule 15

COMPLAINTS OF SHAREHOLDERS

Complaints of any kind against the COMPANY or any of its agents should be made promptly in writing to the Management of the COMPANY. Shareholders and/or their tenants shall have the right to refer such complaints to the Board either in writing or in person.

Rule 16

CHARGES FOR OPERATION AND MAINTENANCE OF SYSTEM

1. The cost of maintenance and/or operation of the irrigation and drainage systems controlled, owned, or to be owned, by the DISTRICT, as

well as the cost of such betterments and/or extensions as may be necessary to provide an adequate and uniform distribution of water to all Shareholders, and to provide adequate and uniform drainage to the lands within the boundaries of this COMPANY, shall be borne by all the Shareholders in the proportion that the number of acres of land owned by each of them bears to the total number of acres of land under the COMPANY's system except as provided in Rule 17, but in any case, shall not be less the TEN Dollars ($10.00) per annum. The obligation to pay said costs and/or charges shall run with and bind the land described in the stock certificates, and any charges made or assessments levied shall be and constitute a lien on said land. Shareholders must pay the above charges even though they do not desire or receive water.

2. The Secretary, or such other person as may be designated by the Board, shall, at times to be fixed by the Board, collect from each Shareholders any sums of money which may be due pursuant to the provisions of the foregoing paragraph, and Rule 17, or at the discretion of the Board. Assessments may be levied in the manner provided by law to cover or defray such items of expense as may be necessary or proper for the COMPANY to incur.

3. All service charges or bills rendered by the COMPANY must be promptly paid, and any Shareholders who fail for a period of thirty (30) days to pay any lawful charge or bills rendered by the COMPANY after the same has been rendered or demanded, shall not be entitled to demand or

receive water or service of any kind from the COMPANY, and a service fee of five percent (5%) of the amount of such unpaid charge of bill may be added thereto and collected from the Shareholders and an additional one and a half percent (1.5%) of the total bill will be added as long as the charge of bill remains unpaid. Nevertheless, if such charge or bill, including penalties, is not paid within one (1) year after the same has been rendered or demanded, such Shareholders will be subject to forfeiture of all right to receive or demand water or service from the COMPANY, and said Shareholder stock may become treasury stock.

Rule 17

MINIMUM CHARGE AND SURCHARGE FOR FRACTIONAL SHARE

Any Shareholders owning less than one (1) share of capital stock of the COMPANY, in the aggregate, shall pay the charges defined in Rule 16 and in addition thereto pay a surcharge of Ten Dollars ($10.00) per annum if the area to which said stock is appurtenant is irrigated during the year, and only Ten Dollars ($10.00) per annum if the area is not irrigated. The payment shall be in a lump sum and due in January of each year. The minimum charge to any and all Shareholders shall be Ten Dollars ($10.00) per annum, including the charges defined in Paragraph 1 of Rule 16.

Rule 18

LOST CERTIFICATE

Shareholders shall pay a service charge of one-hundred dollars ($100.00) for each certificate of stock for transfer or for replacement of certificates that may have been lost, stolen, destroyed, or otherwise disappeared.

Rule 19

PENALTY FOR NON-COMPLIANCE

Refusal to comply with the requirements hereof, or transgression of any of the foregoing rules and regulations, or any interference with the discharge of duties of any agent of the COMPANY, shall be sufficient cause for terminating delivery of water to the offending party, and water will not again be furnished until full compliance, in the opinion of the Management of the COMPANY, has been made with all requirement hereof.

Rule 20

CHANGES IN RULES AND REGULATIONS

The Board 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 COMPANY. 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 COMPANY, however, a loose-leaf master copy of these Rules and Regulations, including all changes made by the Board, which copy will be open to inspection at any time during office hours of the COMPANY.

SECTION 592 – PENAL CODE OF THE STATE OF CALIFORNIA

"Every person who shall, without authority of the owner or managing agent, and with intent to defraud, take water from any canal, ditch, flume or reservoir used for the purpose of holding or conveying water for manufacturing, agriculture, mining, irrigating or generation of power, or domestic use, or who shall without like authority, raise, lower, or otherwise disturb any gate or other apparatus thereof, used for the control or measurement of water, or shall empty or place, or cause to be emptied or placed, into any such canal, ditch, flume or reservoir, any rubbish, filth, or obstruction to the free flow of the water, is guilty of a misdemeanor."

SAN LUIS CANAL COMPANY

11704 W. HENRY MILLER AVENUE
DOS PALOS, CA 93620
209.826.5112 (Los Banos)
209.387.4305 (Dos Palos)

2023 WATER RATE SCHEDULE

Rates for January - December 2023

TIERS	ACRE FEET /ACRE	$$/ACRE FOOT
1	0 - 1	$24
2	1 - 2	$28
3	2 - 3	$29
4+	3 - 4+	$30

* ASSESSMENT $35 ACRE

* Assessment does not include water

TO: Shareholders and Water Users
FROM: John Wiersma, San Luis Canal Company (SLCC) General Manager
DATE: February 21, 2023
SUB: Water Year (WY) 2023 Operations Plan

Shareholder/Water Users (Shareholders),

While our area has received a substantial amount of rain in the last two months, it is still too soon to know whether the year will be *Shasta Critical or Non Critical*. SLCC took steps in late 2022 to prepare for both scenarios, by setting surface water allocations and adopting other supplemental allocation programs. We will continue to monitor the hydrology conditions as they develop, and will provide you information as soon as it becomes available. In the meantime, we want to keep you all informed as to the operational measures in place regarding WY 2023 allocations. The remainder of this letter outlines those measures.

Surface Water Allocation

SLCC will be implementing the following 5-Month and 7-Month surface water allocations for WY 2023:

1. 7-Month surface water allocation of 2.5 AF/AC (April-October 2023, *Shasta Critical Year*)
2. 7-Month surface water allocation of 2.8 AF/AC (April-October 2023, *Shasta Non-Critical Year*)
3. 5-Month surface water allocation of 0.5 AF/AC (January, February, March, November, December 2023)

Water Operations

While we are extremely thankful for the additional rain this year, it has provided some challenges to our tight construction deadlines. Staff is working diligently to ensure that the pre-irrigation season will not be interrupted. We appreciate your patience as we recharge our facilities and maneuver through some of the delays caused by the recent precipitation.

As always, SLCC will fully utilize every drop of surface water we receive. We would like to remind our Shareholders of various ordering and operational procedures in place, to allow SLCC to minimize operational spills and put every drop of water to use. We can only do this with the help and communication of our Shareholders.

The Operations Department should receive a minimum 48-hour notice (72-Hour or more is preferred) for all water orders, and the order placed by 7:30 am. While we strive to get the water to you within 48 hours, please note that may not always be possible. As with previous years, deliveries will be filled in the order received.

Consistent with years past, we need a duration for every order placed. It is extremely important we have the correct duration, and Shareholders do not turn water back early. When this happens, we are at risk of losing that water to operational spills. Any water ordered but not used will be counted towards your SLCC allocation if it can't be used by another. Also, Sunday shutoffs are extremely hard to manage without creating operational spill. We are asking help from all users to avoid or minimize weekend shutoffs to the extent possible.

To improve our customer service and provide easy, real time access to your account information, we encourage all Shareholders to use the Water User Interface (Water UI). Water UI provides Shareholders with the most updated information about their water usage and can be accessed from the main page of the SLCC website, by clicking "Shareholder Portal" at the top of the page. We want to remind everyone it is the Shareholders responsibility manage their own allocations, and Water UI is great tool to help shareholders. If you do not have enough water to complete your irrigation, please call Christine Ruiz immediately to work out potential solutions.

<u>Supplemental Allocation Program(s)/ Shareholder Private Ground Water Program(s)</u>
In efforts to maximize all options to our Shareholders, SLCC will be implementing several Supplemental Allocation Programs. This includes facilitating moving surface water in from other Exchange Contractor entities and purchasing supplemental allocation at $93.50. Additionally, SLCC will continue to allow Shareholders to pump groundwater for themselves and continue to facilitate Shareholder to Shareholder pumping to supplement the SLCC supplied surface water allocations. Please note participation in these Programs is subject to SLCC approval, terms and conditions, and loss factors apply. It is imperative that our Operations Department receive a minimum 48-Hour notice (72-Hour or more is preferred) for all Shareholder private pumping plans.

We appreciate the cooperation and efforts we are receiving from our Shareholders on these operational parameters, and we ask all to continue those efforts. As always, the Company will keep everyone informed of any developments to our water supply or change in conditions. Please feel free to call the office if you have any questions or concerns at (209) 826-5112.

Adopted: March 26, 2009
Revised: December 20, 2018

SAN LUIS CANAL COMPANY
WATER TRANSFER POLICY

In order to implement Section 3405 of the Central Valley Project Improvement Act (CVPIA) of 1992 (PL 102-575), the San Luis Canal Company ("Company") adopts this establishing the rules and regulations governing transfers of Central Valley Project Water.

1. **Exclusive Right to Transfer**: Inasmuch as the San Luis Canal Company, as a corporate body, possesses the right to receive water pursuant to the Exchange Contract with the United States Bureau of Reclamation (USBR), and inasmuch as the Corporation shareholders possess the right to receive water from the Corporation, it is this Company's position that only the San Luis Canal Company can transfer Corporation water pursuant to Public Law 102-575, Section 3405.
    a. Eligible Transferor: Only Company shareholders may transfer Company water allocations to which they are entitled from Company.
    b. Company Approval: All water transfer proposals must be approved by the Company. The transferor must demonstrate by application that the transfer does not unreasonably impact:
        1) The quantity and quality of all the water supply available to the Company and its shareholders.
        2) The Company's operations including, but not limited to, the ability of the Company or its agents, servants and employees to meet its delivery obligations, obtain additional water supplies, and undertake conservation measures, exchanges, transfers, groundwater storage, or conjunctive use programs.
        3) The Company's financial condition or its cost of providing water service to its shareholders.
        4) Any other relevant factor that may create adverse financial, operational or water supply impacts, on the Company or its shareholders, including the ability to meet current and future legal obligations such as the Sustainable Groundwater Management Act.

2. **Definitions**

a. Shareholder: One who owns land within the Company boundaries

b. Recipient District:

1) A District or mutual water company within the geographical area described in the San Joaquin River Exchange Contractors Water Authority's 25-year Transfer Program, or

2) A District or Mutual Water Company approved in future transfer programs conducted and approved by San Joaquin River Exchange Contractors Water Authority and USBR, or

3) A District or mutual water company that agrees in writing to comply with terms and conditions of the transfer.

3. **Compliance with Laws and Regulations**: Although only the Company has the right to transfer water under the provisions of the CVPIA, the transfer proposal must comply with the express provisions of that Act and all applicable regulations and guidelines of the Secretary of the Interior. All transfer proposals must also be consistent and legally compatible with State law, including, but not limited to, the provisions of the California Environmental Quality Act (CEQA). In addition, transfers must be approved by the Contracting Entities and not jeopardize the "Second Amended Contract for Exchange of Waters." (Revised 12/6/67)

4. **Types of Transfers:** The following are separate and distinct transfers recognized by the Company:

a) Conservation Transfers: This type of transfer is defined as one in which conserved water is transferred through Company programs that benefit all shareholders. As the Company conserves water through a variety of methods, it may decide to transfer said water through annual and multi-year transfer programs. Any revenue generated through a conserved water sale will be utilized by the Company at the discretion of the Board of Directors.

b) Land Fallowing Transfers (Landowner to Themselves): This type of transfer is defined as one in which a Company shareholder would fallow a specific portion of their land within the Company boundary and transfer an amount of water that would have been consumptively used on those fallowed lands to property within a Recipient District owned by the same landowner.

c) Land Fallowing Transfers (Company to a Recipient District): This type of transfer is defined as one in which a Company shareholder fallows a specific portion of their land within the Company boundary, and the Company transfers an amount of water that would have been consumptively used on those fallowed lands to a Recipient District.

d) Well Water Exchange (Substitution): This type of transfer is defined as one in which water is generated through pumping of a private well owned by a shareholder within the boundaries of the Company, used by the Company for irrigation deliveries and a like amount (less applicable losses) is transferred to the same shareholder owned land in a Recipient District.

5. **Fallowing Transfer Limitations**: The amount of Company water that can be transferred without unreasonable impacts on the water supply, water quality, operations and financial conditions of the Company and its water users is limited. The Company will not make any transfers that would adversely impact the water supply for its shareholders land. Shareholder requested transfers shall not exceed 20% of the Company's water supply subject to contract with the USBR.

   a. Consumptive Use Limitation: Only water that would have been consumptively used during the term of the transfer may be transferred. The Company reserves the right to limit transfers during specific months to the quantity of water that would have been consumptively used by the transferor during those months.

   b. Correlative Share Limitation: The amount of Company water that can be transferred without unreasonable impacts on the water supply, operations, and financial conditions of the Company and its shareholders is limited. The Company considers the right of individual shareholders to transfer their water allocation to be limited to correlative share of the total transferable Company supply. The Company will not approve any transfer proposal that would prevent other Shareholders from transferring their correlative shares of the transferable supply of Company water. If a shareholder elects not to utilize its share of the followable land allocation, the unutilized portion of the allocation shall be made available to the other SLCC shareholders in proportion of their owned acreage with the boundary.

6. **<u>Groundwater Limitations</u>**: Any Well Water Exchange has the potential to cause significant long-term adverse impacts on groundwater conditions within the Company's service area, and result in an unreasonable interference with pumping rates of capacities of wells within the Company's service area. Therefore, all Well Water Exchanges must adhere to the Company's policies and monitoring programs designed to avoid any adverse impacts, and shall be unilaterally terminated by the Company in the event the Company determines that the Well Water Exchange is causing adverse impacts.

7. **<u>Transferee Limitations</u>**: In order to promote the purposes of the CVPIA and to avoid unreasonable adverse impacts on the water supply, water quality, operations, and financial condition of the Company and its water users, the company will not enter into a water transfer unless:
   a. The Recipient District initiates a reasonable water conservation program that includes efficient water management practices or is in compliance with an urban water management plan under Water Code Section 10610 et esq.; an urban water shortage contingency plan under Water Code Section 10621, Section 10631, and Section 10656; or an agricultural water management plan adopted pursuant to Water code Section 10800 et seq. or any revised codes together.
   b. The Recipient District conducts a drainage study to assure that the water transfer will not cause a deleterious effect on lands in proximity to lands irrigated as a result of the transfer. The drainage study can be avoided if it is mutually agreed upon by the transferee and the Company that the transferred water is being delivered to lands that are not considered impacted by the effects of drainage.
   c. The Recipient District demonstrates that it will not be dependent upon the transferred water supply at the end of the term of the proposed transfer and will be able to relinquish the transferred water supply at that time.

8. **<u>Submission of Proposals</u>**:

a. Preliminary Proposals: An applicant under this policy may submit a preliminary water transfer proposal to the Company prior to the submission of a formal water transfer proposal. The purpose of the preliminary water transfer proposal is to provide an informal review by Company staff in order to advise the transferor of any perceived deficiencies, additional requirements, conditions, or objections that would likely occur if a formal proposal is made. The response of the Company to a preliminary proposal shall not be deemed as anything more that advisory, nor shall Company be bound by any responses, suggestions, or conclusions expressed therein.

b. Formal Proposals: Before a formal water transfer proposal can be submitted to the USBR by the Company, the transferor shall submit two (2) complete copies to the Company. A proposal shall be deemed complete for the purposes of Company review only when it has been deemed complete by USBR and contains sufficient information for the Company to determine the impact of the proposed transfer on the water supply, operations and financial conditions of the Company and its water users, and compliance with CEQA. The transferor must supply any additional information requested by the Company in order to enable the Company to meet its responsibilities to review the proposal.

c. Agreement to Fallow Land: No formal proposal shall be considered as complete without an agreement signed by the transferor to fallow the land to which the transferred water would have been delivered for each crop year in which a transfer is made.

9. **Future Modifications**: Any Company approved transfer shall be reviewed annually, but could be subject to modification from time to time as required in response to:

   a. Changes to applicable laws, regulations, contracts, judicial precedent, and price;

   b. Changed circumstances that cause a transfer to result in unreasonable impacts on the water supply, operations, or financial conditions of the Company or its shareholders.

   c. Proposals by other shareholders within the Company to transfer their correlative share of the Company's transferable water supply that, if approved, would result in more than twenty percent (20%) of the Company's long-term water supply from the USBR being committed for transfer.

10. **Hearings**: The Company may conduct one or more public hearings in order to determine the impact of the proposed transfer on the water supply, operations, and financial conditions of the Company and its shareholders, and to ensure compliance with State and Federal law and regulation. The transferor, and the transferee, or their respective representatives, shall attend any such hearing if requested to do so by the Company in order to respond to questions and comments regarding the impact of the proposed water transfer. At the hearing, the Company may modify the proposed transfer and add conditions, as necessary, to protect the Company and its shareholders.

11. **Transfer Costs:** The transferor shall be responsible for all Transfer Costs as set forth in the current Company policies. These costs include, but are not limited to consultant expenses and staff time.

12. **Company Charges**: The transferor shall be responsible for all Company charges as set forth in the current Company policies. These charges include, but are not limited to, fees imposed by the USBR, assessments, volumetric water charges and any delinquencies on past due accounts.

13. **Indemnification**: The transferor and Recipient District shall defend, indemnify, and hold the Company harmless against any claims of third parties that the transfer:
    a. Violates the terms of that certain contract dated February 14, 1968 between CENTRAL CALIFORNIA IRRIGATIONS DISTRICT, COLUMBIA CANAL COMPANY, SAN LUIS CANAL COMPANY, and FIREBAUGH CANAL COMPANY entitles "Second Amended Contract for Exchange of Waters".
    b. Is not beneficial or reasonable use of water.
    c. Violates any State or Federal law or regulation including, but not limited to the National Environmental Policy Act (NEPA), CEQA, Endangered Species acts, Water Quality statutes, and Area of Origin laws;
    d. Has caused or will cause injury or damage to any person or property, including violations of any contracts, leases, trust deeds, or water rights.

e. Has resulted, or is likely to result, in the breach by either transferee or transferor or any contractual or statutory duties.

14. **Relinquishment** – Regarding fallowing transfers, in exchange for approval by the Company of the transfer, as provided herein, the transferor shall relinquish for the duration of the approved transfer the right to receive the quantity of Company water that would have been supplied, in the absence of the transfer, to the land subject to the approved transfer. The transferor and Recipient District shall abide by the termination date of the transfer unless extended in the manner provided by law and neither shall contest the return of the transferred water supply to the Company's service area upon such termination. In particular, the Recipient District shall waive any claim of dependency, detrimental reliance, or intervening public use, as a basis for extending the water transfer beyond its approved term.

SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY WATER TRANSFER POLICY & DRAINAGE TRANSFER POLICY

Adopted April 7, 2000
Adopted Revised Policy – November 6, 2020

1. Background.

1.1 The San Joaquin River Exchange Contractors Water Authority (**SJRECWA**) is a joint exercise of powers authority formed and existing under California law. Its member agencies are Central California Irrigation District, San Luis Canal Company, Firebaugh Canal Water District, and Columbia Canal Company. These four entities are traditionally referred to collectively as the **Exchange Contractors**.

1.2 The **Exchange Contractors** hold pre-1914 water rights on the San Joaquin River. In order to facilitate the construction of the Central Valley Project, the **Exchange Contractors** and their predecessors entered into two contracts with the United States Bureau of Reclamation (Reclamation) in 1939. The Purchase Contract conveyed excess San Joaquin River flows—the so called "high flows" -- and reserved the first San Joaquin River flows—sometimes referred to as the "low flows" -- to the **Exchange Contractors**. The Exchange Contract established the terms pursuant to which a substitute supply of water was to be delivered by the Reclamation to the **Exchange Contractors** in lieu of their "low flow" diversions from the San Joaquin River. These agreements established the underpinnings for the Reclamation to construct Friant Dam on the upper San Joaquin River and divert the river's natural flow north to Madera and Chowchilla through the Madera Canal and south into Kern County through the Friant-Kern Canal. The Exchange Contract specifies that so long as the **Exchange Contractors** are provided a quantified substitute supply of water, the **Exchange Contractors** will not exercise their pre-1914 right to divert water from the San Joaquin River. The Exchange Contract at Article 5a contemplates that most, if not all, of this substitute water will be delivered to the **Exchange Contractors** from the Sacramento River watershed, pumped from the South Delta, and conveyed by means of the Delta-Mendota Canal. The current Exchange Contract is the Second Amended Contract for Exchange of Waters, Contract No. Ilr-1144, executed February 14, 1968.

1.3 The **SJRECWA** was formed in 1993 to represent its four member entities in many water matters including issues related to water transfers.

1.4 In California, the concept of water transfers, also referred to as water marketing or water brokering, is considered by some to be a partial solution to the shortage of water. The underlying assumption is that market forces in a free market will reallocate water. In some circumstances, agricultural water users who manage a conjunctive use water resource area can, to some extent, provide flexibility which may, at times, facilitate transfers of water. The **Exchange Contractors** proactively manage their surface water, groundwater, and conserved water conjunctively to maximize its beneficial use.

2. Objective. The objective of this water transfer policy is to manage water transfers to provide a framework by which the **Exchange Contractors** manage water transfers on a sound scientific basis, and to provide a clear set of standards and guidelines that each transfer proposal must comply with, and to only allow **SJRECWA**, or its member entities, to market and/or transfer water, and not individual landowner(s). The approach is designed to (i) ensure that the quantity of water proposed for transfer is made available through technically sound methods and projects which are scientifically based and verifiable; (ii) provide sound analysis of potential water transfer impacts; (iii) properly develop and implement necessary mitigations; (iv) monitor on-going water transfers and water development projects to ensure that beneficial and conjunctive use objectives are met; (v) provide flexible and efficient use of available water resources; (vi) ensure that the water supply, operations, and financial condition of the **Exchange Contractors** and their water users are not unreasonably impacted, and third party impacts from the transfer are mitigated; and, (vii) establish, maintain and utilize a data bank that will be used to manage the San Joaquin River Exchange Contractors Groundwater Sustainability Agency's Groundwater Sustainability Plan. The Transfer Policy will be reviewed by the Water Transfer Committee and Board of Directors every five (5) years, or as needed.

3. Authority

3.1 A transfer of water is considered a beneficial use under state and federal law. (Water Code Section 1011; CVPIA Section 3405.)

3.2 The **Exchange Contractors** hold pre-1914 rights to appropriate water from the San Joaquin River. The California Legislature has declared that it is established policy of the State to facilitate the voluntary transfer of water and water rights. (Water Code Section 109.) The Costa-Isenberg Water Transfer Act adopted by the legislature in 1986 as Water Code Sections 470 and 475-484 provides that voluntary water transfers between water users can result in a more efficient use of water, alleviate water shortages and finds and declares that it is in the public interest to conserve all available water resources. Water transfers do not undermine the rights that are the basis of the transfer. Water Code Sections 1010, 1011, 1011.5, 1244, 1440, 1731, 1737 and 1745.07 were specifically added to provide protection to water right holders who transfer water.

3.3 Reclamation utilizes the water transfer authority provided for in CVPIA to facilitate Exchange Contract water transfers. Water transfers implemented in accordance with CVPIA Section 3405(a) are deemed by federal law to be a beneficial use of water.

4. Applicability. Proposals to transfer any water from the **Exchange Contractors**' service area are subject to the requirements of this policy.

5. Definitions. For purposes of this policy, "water district" shall mean any water district, irrigation district, municipality, federal water agency, state water agency, or similar entity that exists pursuant to federal or state law.

6. Criteria for Water Transfers

6.1 Basis for all water transfers.

6.1.1 The state water rights, that are the underpinning of the Exchange Contract, are owned by the individual **Exchange Contractors'** members. The federal contract rights pursuant to the Exchange Contract are similarly owned by the individual **Exchange Contractors'** members. Consequently, any transfer of water from the **Exchange Contractors'** service area must first be approved by the **Exchange Contractors'** member entity from which the water will be transferred and then by the **SJRECWA**.

6.1.2 The **Exchange Contractors'** member entities share a water right in common, have a single watermaster who schedules water deliveries to the member entities, and are in the process of completing a Groundwater Sustainability Plan (GSP) as required by the Sustainable Groundwater Management Act (SGMA) of 2014. The **Exchange Contractors** actively manage their surface water, groundwater and conserved water resources conjunctively, and manage water application within their service area to minimize drainage discharges from their service area and to cope with regulatory requirements imposed by law. Thus, all proposals to transfer water must be submitted by an **Exchange Contractors'** member entity and by the **SJRECWA** on behalf of its member entities, and water transfer proposals shall not be accepted from individual landowners. An individual landowner who proposes a water transfer must submit the proposal to the landowner's member entity, and, if approved by the member entity, shall be submitted by the member entity on behalf of the individual landowner.

6.1.3 It is imperative to protect the member entity's water rights and to assure that no water right is assigned; therefore, only annually severable water transfers will be considered.

6.2 Water transfer types.

6.2.1 All water transfers shall be proposed by an **Exchange Contractors'** member entity. Additionally, the individual entities may propose a transfer jointly with any or all of the member entities. A transfer of water proposed jointly by all of the member entities shall be handled as a **SJRECWA** water transfer.

6.2.2 Therefore, transfer proposals are limited to three types:

6.2.2.1 A transfer of water by the **SJRECWA** on behalf of its four member entities.

6.2.2.2 A transfer of water by an **Exchange Contractors'** member entity to another water district.

6.2.2.3 A transfer of water by an **Exchange Contractors'** member entity to a water district that is made on behalf of an **Exchange Contractors'** landowner who is entitled to receive Exchange Contract water.

6.3 Water to be transferred. Water that is subject to transfer may be from an **Exchange Contractors'** member entity's water entitlement allocated pursuant to the Exchange Contract Division of Water Agreement, or from a member entity's non-allocated water supplies.

6.4 Generation of transferable water. Transferable water can be generated by using standard methods of conservation, groundwater substitution, or fallowing depending on the special hydrologic conditions that exist within the service area where the water is being generated as determined in paragraph 6.6.

6.5 Transferees. Water shall only be transferred to a water district.

6.6 Technical standards. All water transfers are subject to the technical standards and criteria adopted by the individual entity that proposes the transfer, and the **SJRECWA.** The technical standards are attached hereto as Appendices.

6.7 Priority of Transfers. All transfers are subject to the following priorities:

6.7.1 First priority shall be given to transfers initiated by the **SJRECWA** on behalf of its four member entities, and/or a transfer by an **Exchange Contractors'** member entity that enables an individual landowner within the member entity's service area to transfer water to a CVP ag service contracting water district for their own use in that water district.

6.7.2 Second priority shall be given to transfers initiated by an **Exchange Contractors'** member entity.

6.7.3 Third priority shall be given to transfers proposed by an **Exchange Contractors'** member entity on behalf of one of its landowners.

6.7.4 For illustrative purposes, the attached Appendix "A" provides an example of how the priority system would be implemented under the following three scenarios: 1) the transfer demands are less than the transfer supply during a normal water year; 2) the transfer demands are greater than the transfer supply during a normal water year; and, 3) a critical water year.

6.8 Limitation on Quantity of Water Transferred. For the years 2019 through 2023, the maximum quantity of transfers in each category is as follows:

Table 6.8

PROGRAM	*ACRE FEET (AF) MAXIMUM*	*NOTES*
Current Conservation	80,000 AF	Divided on Four Entity split *
Additional Conservation	20,000 AF	Divided on Four Entity split*
Drainage	20,000 AF	Under the Drainage Transfer Policy
Fallowing	50,000 AF	Divided on Four Entity split*
Groundwater Exchange.	28,000 AF	Divided on Four Entity split *

* Subject to Section 6.8.1.

The annual amount of transfer water to be offered to M&I purchasers is capped at 10,000 AF. The 10,000 AF is from within the quantities in Table 6.8 and not in addition to those amounts.

Each year, each entity shall declare the quantity of water that will be transferred out of the **Exchange Contractors'** service area. The aggregated amount of the water to be transferred shall not exceed the amounts in Table 6.8 above.

Each year, as soon as practicable, and not later than the **Exchange Contractors'** March board meeting, the transfer quantity for the upcoming water year shall be announced. The announced maximum shall not be changed upward or downward from the announced maximum unless clear and convincing scientific evidence supports the change. Transfers initiated by **SJRECWA** will not be permitted in a critical water year designated under the Exchange Contract.

6.8.1 Internal Allocation of Transferable Water: On an annual basis, any Exchange Contractors' member entity may assign any portion of their maximum percent allocation in any of the transfer classifications to one or more of the Exchange Contractors' member entities and this assignment will increase the recipient Member Entity's share of transfers in the classifications stated below. The baseline for determining the Exchange Contractors' member's maximum percent allocation is the 1978 Division of Water Agreement subject to modifications pursuant to Sections 6.8.2.1 and 6.8.2.2.

6.8.2 Transfers will be classified as: (i) conservation or (ii) groundwater exchange or substitution or (iii) fallowing transfers or (iv) drainage transfers. The income from each classification of transfer will be blended and distributed to the member entities in proportion to the amount of water contributed by each entity.

6.9 Annual Establishment of Transferees and Maximum Quantities of Water to be Transferred to Each Transferee. Each year by no later than March 1st, the **SJRECWA** shall establish the transferees and maximum quantities of water to be transferred to each transferee. The water needed to meet these obligations will be in accordance with the transfer priorities established by Section 6.7.

6.10 Water Transfer Committee.

6.10.1 A **SJRECWA** Water Transfer Committee is established to review all transfer proposals that are submitted consistent with this policy. It will review and analyze the technical data upon which each transfer is based and make a recommendation on each water transfer proposed. The membership of the committee will include the manager of each of the **Exchange Contractors'** member entities, and one board member from each member entity, or a member's alternate, appointed by the President of the board. The committee may retain technical consultants.

6.10.2 The committee shall review each transfer proposal and each approved transfer annually to ensure that it meets the stated objectives, technical standards, and criteria of this policy.

6.10.3 Due to the fact that the **Exchange Contractors** and their landowners conjunctively use surface and groundwater resources where a water transfer is proposed from lands that the committee believes will not participate fully in the conjunctive use program, the committee may limit a water transfer to the amount of groundwater used by the lands initiating the transfer so that those lands do not exceed annually their fair share of the safe yield.

6.10.4 The committee shall review each transfer proposal and each approved transfer annually to consider whether it is likely to cause unreasonable impacts to the overall water supply, water management operations, or financial condition of the transferor entity or its water users, and whether member entity impacts that result from the transfer will likely be mitigated.

6.10.5 The committee shall make a recommendation to the **SJRECWA** Board of Directors on each proposed transfer, and an annual recommendation for the continuation or termination of each approved transfer, based upon analysis of technical criteria developed pursuant to paragraph 6.6.

6.11 Water Transfer Fees, Mitigation Costs, and Water Transfer Proceeds.

6.11.1 Where a transfer is made by a **SJRECWA** member entity, the entity will allocate a portion of the income from the water transfer to conservation projects and/or water distribution and drainage facilities, or other similar projects and actions that benefit its water users.

6.11.2 Any Bureau of Reclamation, or state agency water transfer application and environmental assessment fee shall be the responsibility of the transferring entity.

6.11.3 The processing by **SJRECWA** of a water transfer will require the payment by the transferring entity of all costs associated with the transfer. Such cost shall include but not be limited to management and study costs associated with administration of the Transfer Policy. For example, where a transfer involves groundwater, the transferring entity will be responsible for the cost (i) to determine safe annual yield of groundwater, (ii) for monitoring required to analyze groundwater conditions both in terms of quantity and quality, (iii) the amount of applied water that recharges the groundwater or enters drainage systems, and (iv) to study and monitor for subsidence impacts.

6.11.4 The **SJRECWA** shall be the fiscal agent for all water transfers.

6.12 Environmental Requirements. The environmental review requirements of NEPA and CEQA must be complied with before the **Exchange Contractors** will process a transfer application and all such costs shall be born by the transferring member entity.

6.13 Public Hearing. The **Exchange Contractors** may conduct a public hearing to determine the impact of the proposed transfer. The transferor and transferee must attend the hearing if requested to do so by the **Exchange Contractors** or by the entity from which the transferor is entitled to receive water.

6.14 Action by **SJRECWA** Board of Directors. All water transfers must be approved by unanimous vote of the **SJRECWA** Board of Directors. A water transfer proposal along with the recommendation by the Water Transfer Committee will be considered by the **SJRECWA** Board of Directors, and the transfer approved, disapproved, or returned to the Water Transfer Committee for further action as directed by the Board.

APPENDIX "A"

Illustration of Transfer Policy Priority System

Annually the SJRECWA shall establish:

1. Annual Maximum – The maximum annual amount of water to be transferred from the SJRECWA developed on a sub-basin by sub-basin level. (Section 6.8)

2. Demand – The maximum quantities of water to be transferred to each transferee shall be established by no later than March 1st of each year. (Section 6.9)

3. SJRECWA Supply – The amount of water available under a SJRECWA transfer and/or a transfer by an **Exchange Contractors'** member entity that enables an individual landowner within the member entity's service area to transfer water to a CVP ag service contracting water district for their own use in that water district. First priority. (Section 6.7.1)

4. Individual Entity Supply – The amount of water available under an individual entity transfer. Second priority. (Section 6.7.2)

5. Individual Entity on behalf of landowner supply – The amount of water available for an entity on behalf of a landowner, limited by the maximum demand. Third priority. (Section 6.7.3)

The application of the priority system described in section 6.7 is limited to determining quantities of transfer demand to be met by each of water transfer types. It will be calculated as follows (Section 6.9):

	TOTAL DEMAND
Less	***Amount available through SJRECWA initiated and/or Exchange Contractors' member entity that enables an individual within the member entity's service area to transfer water to a CVP ag service contracting water district for their own use in that water district (priority 1)***
Equals	***Amount available for priority 2 and priority 3***
Then	***Amount available through priority 2 and priority 3***
Less	***The amount of water available under an individual entity transfer (priority 2)***
Equals	***Amount available through priority 3***

Individual landowners will be notified of the amount of transfer demand available to be met by the third priority. They will be required to determine their level of participation (through fallowing as an example) as soon as possible.

To further illustrate the priorities, below are three types of water year scenarios:

NORMAL YEAR

100 % allocation to EC; demand is 95,000 af which exceeds Supply

Priority		Supply	Demand	Amount Transferred
1	SJRECWA/ dist. to dist. initiated	75,000	85,000	75,000
2	Exchange Contractor Entity Initiated	5,000	5,000	5,000
3	Exchange Contractor Entity Initiated on behalf of Individual	5,000	5,000	5,000
		85,000	95,000	85,000

Total amount transferred **85,000**

NORMAL YEAR

100 % allocation to EC; demand is 65,000 af and is less than Supply

Priority		Supply	Demand	Amount Transferred
1	SJRECWA/ dist. to dist. initiated	75,000	65,000	65,000
2	Exchange Contractor Entity Initiated	5,000	0	0
3	Exchange Contractor Entity Initiated on behalf of Individual	5,000	0	0
		85,000	65,000	65,000

Total amount transferred **65,000 af**

CRITICAL YEAR

75 % allocation to EC; demand is 25,000 af and is greater than Supply

Priority		Supply	Demand	Amount Transferred
1	SJRECWA/ dist. to dist. initiated	0	0	0
2	Exchange Contractor Entity Initiated	0	0	0
3	Exchange Contractor Entity Initiated on behalf of Individual	5,000	25,000	5,000
		5,000	25,000	5,000

Total amount transferred **5,000 af**

(Appendix to Subparagraph "6.6," Part 1 of 2)

Maximum Quantity of Water Transferable from the Exchange Contractors Service Area due to fallowing

Adopted August 5, 2005

Land Fallowing
Technical Standards and Guidelines

1. The requirements of this section will be the responsibility of the Entity from which the fallowing transfer is proposed to provide or implement.
2. **Maximum Quantity of Transferable Water**
    a. The maximum quantity of water (Max Transferable) that can be transferred by a landowner fallowing land is the *lesser of the monthly **Consumptive Use** of the crop being fallowed or the **Exchange Contractor Entity Deliverable Monthly Entitlement**.* (Subject to **Adjustments** within paragraph d, and the limits or reductions within Part 2 of 2 paragraphs 3c., 3d., and 3e. of this Appendix.)
    b. **Consumptive Use**
        i. The consumptive use will be calculated using the average of the crops grown on the land for the past three normal water years.
        ii. Consumptive Use (CU) = Evapotranspiration Crop + Required Leaching Fraction (LF) – Effective Precipitation.
            1. CU = Etc + LF – EP
        iii. Etc is calculated on a monthly time step for the calendar year. Data on the baseline three year average ETo and rainfall is collected from the nearest CIMIS station(s). The crop coefficients (Kc) are taken from the SWRCB report # 84-1.
        iv. LF is calculated based on the methodology outlined in the Western Fertilizer Handbook. The ECe and ECw are shown on the attached example. However, these may be updated by the Exchange Contractors.

v. EP is 50% of the three-year average rainfall measured at the nearest CIMIS station(s).

c. **Exchange Contractor Entity Deliverable Monthly Entitlement**

i. The deliverable monthly entitlement is that quantity of Exchange Contract Water, on average, (not other water such as well water) that can be delivered to farmed fields within the entity.

ii. The deliverable monthly entitlement is calculated on a per acre basis.

1. The deliverable monthly quantities are the Division of Waters Agreement quantities less system losses and other commitments divided by total entity acreage.

d. **Adjustments**

i. The deliverable monthly entitlement may be accumulated (bath tubbed) for the 7-month period so long as the bath tub is being provided by Reclamation in accordance with the Refuge Water Transportation Agreement.

3. **Determination of Acreage of Fallowed Land**

a. Acreage of Fallowed land will be based on farmed acres not assessed acreage.

i. The following are acceptable methods for determining farmed acreage:

1. FSA data base;
2. Measurements based on aerial photography;
3. Field measurements, and;
4. Equivalent methods approved by the transfer committee.

b. To the extent possible whole fields will be fallowed.

c. If only a portion of a field is to be fallowed then the fallowed portion must be physically separated from the farmed field by levee or drain. (It is important that surface water not be applied to the fallowed land.)

(Appendix to Subparagraph "6.6", Part 2 of 2)

TECHNICAL STANDARDS AND CHECKLIST FOR A COMPLETE WRITTEN PROPOSAL FOR A TRANSFER FROM AN ENTITY ON BEHALF OF LANDOWNERS

Revised October 7, 2020

1. Name and address of Transferring Entity
2. Names, addresses and locations of the landowners for whom the Transferring Entity is Transferring water on behalf of.
3. If all or a portion of the transfer proposal by the Entity is on behalf of a Landowner for his own use in another District, then:
    a. Provide name, address and location of the Receiving District
    b. Provide detailed location maps of the area(s) proposed to receive the transferred water.
    c. Provide documentation (deed or other equivalent proof) showing the same ownership of area(s) proposed both to develop water within the Entity and to receive water consistent with the transferring Entities' Transfer Policy. The ownerships must be identical unless the Entities' Transfer Policy proposing the transfer requires the reduction in the quantity of the transfer based on the percentage of ownership difference between the in-District land developing the transfer water AND the receiving land in another District, then the District shall provide the calculations for the reduced transfer quantities, and such a transfer will be allowed and the reduction shall be applied.
    d. Provide a signed statement by the landowner that they are also the 100% farming entity of the receiving lands, or, if the landowner is not the 100% farming entity, then the landowner shall provide documentation (Reclamation Reform Act form or other equivalent proof) showing the percentage of interest the landowner has in the farming interest on the receiving land. The Entity proposing the transfer on behalf of the landowner shall provide the calculations to show that the transfer has

been reduced based on the percentage. (Example: Landowner has a 50% interest in the farming operation then the transfer will be reduced by 50%).

e. The quantity of the transfer to the Receiving District shall also be limited to the CVP allocation deficit below 3.0 acre-feet per acre for the Receiving District as of April 1 in the year in which the transfer is to occur. (Example: If the declared CVP allocation as of April 1 is 50%, then the transfer will be limited to 1.5 acre-feet per acre on the receiving land.)

4. For Fallowing transfers:
   a. Provide crop maps showing the locations of fields being fallowed.
   b. Provide a tabulation of the acreage of fields being fallowed and the crops grown during the last three normal water years.
   c. State the quantity of water involved within the transfer and identify the proposed use for the transferred water.
   d. For transfers based on fallowing, provide the calculations of the **Maximum Quantity of Transferable Water** based on the Land Fallowing Technical Standards and Guidelines.
   e. State that the entity will be responsible to field verify that fallowing is accomplished as proposed and that an end of the year report on the fallowed lands will be provided.
   f. State that the entity will guarantee that the fallowed lands will be maintained so as to not create a nuisance to neighboring lands.

5. For transfers based on groundwater exchanges or substitution, provide basis for calculation of quantity of groundwater to be exchanged or substituted and transferred.
6. Provide a complete written description of the transfer proposal, including any special water transfer scheduling.

7. Attach statement by the Entity from where the water is being transferred that the transfer will have no unreasonable impact on water supply, operations, or financial condition of the Entity or its water users.

WATER TRANSFER POLICY RELATING TO DRAINAGE PROJECTS

Adopted: September 3, 2004
Adopted Revised Policy: November 5, 2010
Adopted Revised Policy: April 12, 2019

1. Background.

1.1 The San Joaquin River Exchange Contractors Water Authority (**SJRECWA**) is a joint exercise of powers authority formed and existing under California law. Its member agencies are Central California Irrigation District, San Luis Canal Company, Firebaugh Canal Water District, and Columbia Canal Company. These four entities are traditionally referred to collectively as the **Exchange Contractors**.

1.2 The **Exchange Contractors** hold pre-1914 water rights on the San Joaquin River. In order to facilitate the construction of the Central Valley Project, the **Exchange Contractors** and their predecessors entered into two contracts with the United States Bureau of Reclamation in 1939. The Purchase Contract conveyed excess San Joaquin River flows—the so called "high flows" -- and reserved the first San Joaquin River flows—sometimes referred to as the "low flows" – to the **Exchange Contractors**. The Exchange Contract established the terms pursuant to which a substitute supply of water was to be delivered by the Reclamation to the **Exchange Contractors** in lieu of their "low flow" diversions from the San Joaquin River. These agreements established the underpinnings for Reclamation to construct Friant Dam on the upper San Joaquin River and divert the river's natural flow north to Madera and Chowchilla through the Madera Canal and south into Kern County through the Friant-Kern Canal. The Exchange Contract specifies that so long as the **Exchange Contractors** are provided a quantified substitute supply of water, the **Exchange Contractors** will not exercise their pre-1914 right to divert water from the San Joaquin River. Reclamation will be entitled during those periods to exercise the pre-1914 rights of the **Exchange Contractors** for the benefit of the Friant Users. The Exchange Contract at Article 5a contemplates that most, if not all, of this substitute water will be delivered to the **Exchange Contractors** from the Sacramento River watershed, pumped from the South Delta, and conveyed by means of the Delta-Mendota Canal. The current Exchange Contract is the Second Amended Contract for Exchange of Waters, Contract No. Ilr-1144, executed February 14, 1968.

1.3 The **SJRECWA** was formed in 1993 to represent its four member entities in many water matters including issues related to water transfers.

1.4 In California, the concept of water transfers, also referred to as water marketing or water brokering, is considered by some in California to be a partial solution to the shortage of water. The underlying assumption is that market forces in a free market will reallocate water. In some circumstances, agricultural water users who manage a conjunctive use water resource area can, to some extent, provide flexibility which may, at times, facilitate transfers of water. The **Exchange Contractors** proactively manage their surface water, groundwater, and conserved water conjunctively to maximize its beneficial use.

1.5 Two areas within the **Exchange Contractors**, the Firebaugh Canal Water District and the Camp 13 area of Central California Irrigation District (as shown on the map included in Appendix A), are currently directly impacted by the inaction of the Bureau of Reclamation (Reclamation) to provide drainage to the San Luis Unit adjacent areas. San Luis Canal Company and Columbia Canal Company are impacted more indirectly at this time from the lack of drainage of poor-quality water originating from irrigation of the San Luis Unit and the Bureau's inaction. Poor-quality drainage waters from the San Luis Unit join in the drains and channels of Central California Irrigation District which lead to the service area of SLCC and add salinity and other constituents to those waters which SLCC utilizes for irrigation. In addition, poor-quality drainage enters underground aquifers which CCID and its landowners use for well water. The return flow from that well water has also been historically utilized by SLCC and is degraded by the drainage water escaping the San Luis Unit. Columbia Canal Company and its landowners depend upon substantial amounts of well water to supplement surface water supplies. A front of poor-quality water generated by irrigation of the San Luis Unit without the provision of drainage has been moving eastward toward the Columbia Canal wells, and degradation of the quality of well water from these drainage waters is believed to be occurring and will increase in the future. Per federal law, Reclamation was required to install and operate a drainage system to provide drainage for irrigation waters applied to lands within the San Luis Unit, and the Bureau has not provided for those works. For more than 35 years, irrigation water has been applied to the upslope San Luis Unit lands causing poor-quality groundwater to migrate through groundwater aquifers into these areas of the **Exchange Contractors'** service area. The application of irrigation water upslope has also resulted in increased pressures transmitted downslope into the Exchange Contractors' service area. The pressure causes poor-quality water to rise into crop root zones and drainage systems within the **Exchange Contractors'** service area. At the same time, new regulatory requirements are being placed upon the quality of drainage discharged from the **Exchange Contractors'** service area. Unless the quality of drainage water discharges are improved, drainage will be prohibited or curtailed. It would not be possible to continue irrigated farming under the proposed regulatory conditions. Because the activities upon upslope lands are not within the control of the **Exchange Contractors,** and Reclamation has never complied with its legal duties relating to drainage, the districts, on behalf of the areas where drainage impacts are occurring, are forced to undertake expensive mitigation measures to provide for reduction in drainage quantities and treatment of drainage water to improve the quality of drainage discharges (pursuant to the attached Appendix A -- Technical Criteria for Drainage Plan Transfers). Other adjacent areas of the **Exchange Contractors** may be threatened with impacts from upslope activity and may be required to take similar measures in the future.

1.6 A Drainage Plan Transfer will not compete with annually severable transfers.

2. Objective. The objective of this water transfer policy is to provide a framework to manage water transfers that relate to drainage by which the **Exchange Contractors** manage such water transfers. The framework will provide a sound scientific basis and provide a clear set of standards and guidelines that each such transfer proposal must comply with. The approach is designed to (i) ensure that the quantity of water proposed for transfer is made available through technically sound methods and projects which are scientifically based and verifiable; (ii) provide sound analysis of potential water transfer impacts; (iii) properly develop and implement necessary mitigations; (iv) monitor on-going water transfers and water development projects to ensure that beneficial and conjunctive use objectives are met; (v) provide flexible and efficient use of available water resources; (vi) ensure that the water supply, operations, and financial condition of the **Exchange Contractors** and their water users are not unreasonably impacted, and third party impacts from the transfer are mitigated; and, (vii) establish, maintain and utilize a data bank that will be used to manage the San Joaquin River Exchange Contractors Groundwater Sustainability Agency's Groundwater Sustainability Plan.

3. Authority.

3.4 A transfer of water is considered a beneficial use under state and federal law. (California Water Code Section 1011; CVPIA Section 3405.)

3.5 The **Exchange Contractors** hold pre-1914 rights to appropriate water from the San Joaquin River. The California Legislature has declared that it is established policy of the State to facilitate the voluntary transfer of water and water rights. (Water Code Section 109.) The Costa-Isenberg Water Transfer Act adopted by the legislature in 1986 as Water Code Sections 470 and 475-484 provides that voluntary water transfers between water users can result in a more efficient use of water, alleviate water shortages and finds and declares that it is in the public interest to conserve all available water resources. Water transfers do not undermine the rights that are the basis of the transfer. Water Code Sections 1010, 1011, 1011.5, 1244, 1440, 1731, 1737 and 1745.07 were specifically added to provide protection to water right holders who transfer water.

3.6 Reclamation utilizes the water transfer authority provided for in CVPIA to facilitate Exchange Contract water transfers. Water transfers implemented in accordance with CVPIA Section 3405(a) are deemed by federal law to be a beneficial use of water.

4. Applicability. Proposals to transfer any water from the **Exchange Contractors**' service for the purpose of solving drainage problems caused in whole or in part by the failure of Reclamation to provide drainage to the San Luis Unit are subject to the requirements of this policy. Proposals to receive high quality surface water from outside of the **Exchange Contractors'** service area and to provide on a cooperative basis for the exchange of water with those third parties, and to provide for the transfer of an equal amount of **Exchange Contractor** water pursuant to the exchange in the same calendar year in order to remedy drainage and water quality problems within an **Exchange Contractors** service area, shall be subject to the requirements of this policy.

5. Definitions. For purposes of this policy, "water district" shall mean any water district, irrigation district, municipality, federal water agency, state water agency, mutual water company, or similar entity that exists pursuant to federal or state law.

6. Criteria for Water Transfers

6.1 Basis for all water transfers.

6.1.1 The state water rights, that are the underpinning of the Exchange Contract, are owned by the individual **Exchange Contractors'** members. The federal contract rights pursuant to the Exchange Contract are similarly owned by the individual **Exchange Contractors'** members. Consequently, any transfer of water from the **Exchange Contractors'** service area must first be approved by the **Exchange Contractors'** member entity from which the water will be transferred and then by the **SJRECWA**.

6.1.2 The **Exchange Contractors'** member entities share a water right in common, have a single water master who schedules water deliveries to the member entities and have adopted a single groundwater management plan. The **Exchange Contractors** actively manage their surface water, groundwater and conserved water resources conjunctively, and manage water application within their service area to minimize drainage discharges from their service area and to cope with regulatory requirements imposed by law. Thus, all proposals to transfer water must be submitted by an **Exchange Contractors'** member entity and by the **SJRECWA** on behalf of its member entities, and water transfer proposals shall not be accepted from individual landowners. An individual landowner who proposes a water transfer must submit the proposal to the landowner's member entity, and, if approved by the member entity, shall be submitted by the member entity on behalf of the individual landowner.

6.1.3 Under no condition will a long-term transfer under this policy be an assignment of a water right.

6.2 Drainage Plan Transfers. Water transfer proposals which provide for funding for drainage projects from: (1) the Firebaugh Canal Water District service area and from the Camp 13 service area portion of the Central California Irrigation District or (2) Exchanges of surface water with third parties for the purposes of remedying significant drainage water quality conditions by any of the **Exchange Contractors** which involve transfers of **Exchange Contractors'** water in the same quantity received from the third party in the same calendar year, are hereinafter referred to as "Drainage Plan Transfers."

6.2.1 A Drainage Plan Transfer is one in which all of the following requirements are met:

A. The transfer is of water conserved, developed or exchanged within the service areas described as an integral part of a plan to reduce drainage, manage drainage and improve drainage water quality, which transfer is based upon findings made and adopted by the respective member entity that the transfer will reduce drainage discharges and contribute to compliance with water quality regulatory requirements; and,

B. The transfer is found by the respective member entity to be required because of a failure of the United States Department of Interior, Bureau of Reclamation to provide for the construction and operation of a drainage system as required by Section lA of the San Luis Act irrigated lands and as provided under Section 5 of the San Luis Act and for adjoining lands impacted by irrigation of San Luis Unit lands; and,

C. The net proceeds of the transfer or exchange will be utilized for the purposes of implementing the Drainage Plan of the Member Entity and reducing the physical and monetary impacts to landowners and water users within the described areas of the Member Units service area from drainage and water quality impacts; and,

D. The amounts of water made subject to transfer will not reduce the amounts of water or the schedule of water deliveries available to other member units under the Exchange Contract;

E. Except when an exchange of water in the same calendar year and in the same amount is the basis for the transfer, the amounts of water to be transferred shall be shown by a water budget first prepared and approved by the member unit and then approved by the **Exchange Contractors** to be not in excess of the amounts of water made available as a means of reducing drainage impacts within the **Exchange Contractors'** service areas. The water budget shall be prepared utilizing established scientific methods and shall demonstrate that the transfer will allow continued agricultural use of water within the Firebaugh Canal Water District and/or the Camp 13 area of Central California Irrigation District on a long-term basis in accordance with the Drainage Plan; and,

F. The transfer shall be conditioned upon the maintenance and implementation of long-term monitoring and adjustment factors which will further the Drainage Plan; and,

G. The initial consideration of the transfer pursuant to the Drainage Plan shall occur prior to conduct of CEQA/NEPA processes and final approval shall occur only after completion of all regulatory and environmental processes. Final approval shall be granted only if, in the judgment of the **SJRECWA**, the approval of the transfer and its term will further the goals of the **SJRECWA** in preserving the rights to water of the **Exchange Contractors** and providing a long term means of reducing damages from drainage impacts and the regulatory conditions placed upon drainage flows.

6.2.2 A Drainage Plan Transfer shall be proposed only by an **Exchange Contractors** Member Entity.

6.3 Water to be transferred. Water that is subject to transfer may be from an **Exchange Contractors'** Member Entity's water entitlement allocated pursuant to the Exchange Contract Division of Water Agreement, or from a member entity's non-allocated water supplies. Water exchanged with a Member Entity to permit a Drainage Transfer by a Member Entity in the same calendar year must be received only from the surface water rights of a water district.

6.4 Generation of transferable water. Transferable water can be generated by using standard methods of conservation, groundwater substitution, or fallowing depending on the special hydrologic conditions that exist within the service area where the water is being generated as determined in paragraph 6.6. Transferred water pursuant to an exchange with third parties and receipt of an equal amount of water in the same calendar year will not require evidence of the generation mechanism except as set forth in Paragraph 6.3 above.

6.5 Transferees. Water shall only be transferred to a water district, although a Drainage Plan Transfer may provide that the recipient agency will use the water transferred only for a specific development.

6.6 Technical standards. All water transfers are subject to the technical standards and criteria adopted by the individual entity that proposes the transfer, and the **Exchange Contractors.** The technical standards are attached hereto as Appendices.

6.7 Water Transfer Committee.

6.7.1 An **Exchange Contractors'** Water Transfer Committee is established to review all transfer proposals that are submitted consistent with this policy. It will review and analyze the technical data upon which each transfer is based and make a recommendation on each water transfer proposed. The membership of the committee will include the manager of each of the **Exchange Contractors'** member entities, and one board member from each member entity, or a member's alternate, appointed by the President of the board. The committee may retain technical consultants.

6.7.2 The committee shall review each transfer proposal, and receive annual reports to ensure that it continues to comply with the stated objectives, technical standards, and criteria of this policy.

6.7.3 The committee shall make a recommendation to the **Exchange Contractors'** Board of Directors on each proposed Drainage Plan Transfer, and an annual report to the Board based upon analysis of technical criteria developed pursuant to paragraph 6.6.

6.8 Water Transfer Fees, Mitigation Costs, and Water Transfer Proceeds.

6.8.1 Where a Drainage Plan Transfer is made by an **Exchange Contractors'** member entity, the entity will allocate the net income from the water transfer to conservation projects and/or water distribution and drainage facilities, or other similar projects and actions that are part of the implementation of the Drainage Plan.

6.8.2 Any Bureau of Reclamation, or state agency water transfer application and environmental assessment fee shall be the responsibility of the transferring entity.

6.8.3 The processing by the **Exchange Contractors** of a Drainage Plan Transfer will require the payment by the transferring entity of all costs associated with the transfer. Such cost shall include but not be limited to management and study costs associated with administration of the Transfer Policy.

6.8.4 The **Exchange Contractors** shall be the fiscal agent for all water transfers, (1) except that the **Exchange Contractors** may decline that role in favor of the Member Entity, and (2) if bonds are to be issued by the Member Unit, the transfer proceeds may be pledged as security for bond repayment by the Member Entity.

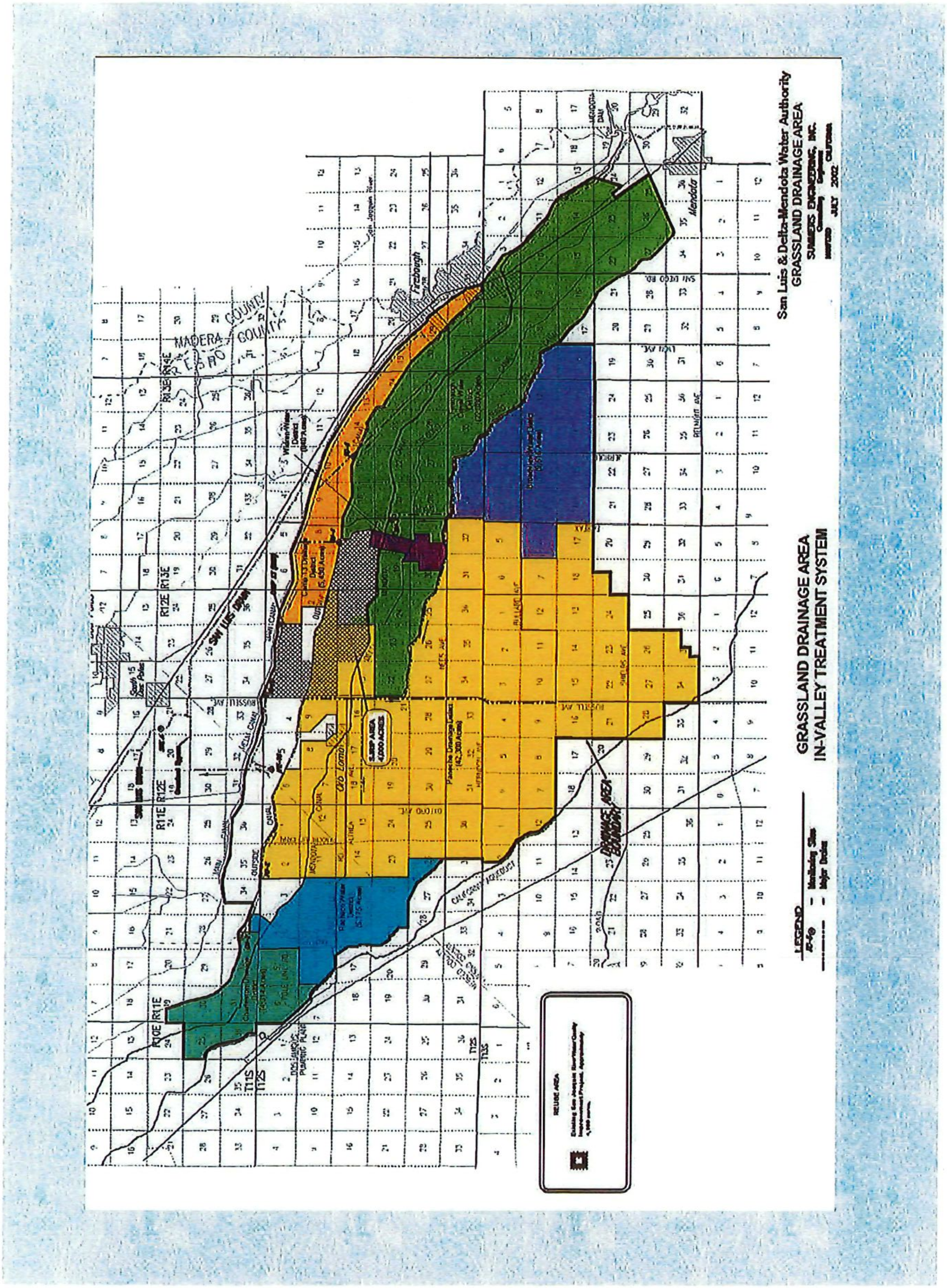
6.9 <u>Environmental Requirements</u>. Any environmental review requirements of NEPA and CEQA must be complied with before the **Exchange Contractors** will process a transfer application and all such costs shall be borne by the transferring member entity.

6.10 <u>Public Hearing</u>. The **Exchange Contractors** may conduct a public hearing to determine the impact of the proposed transfer. The transferor and transferee and/or the third party providing the water to the Member Entity for the exchange must attend the hearing if requested to do so by the **Exchange Contractors** or by the entity from which the transferor is entitled to receive water.

6.11 <u>Action by the **Exchange Contractors'** Board of Directors</u>. All water transfers must be approved by unanimous vote of the **Exchange Contractors'** Board of Directors. A water transfer proposal along with the recommendation by the Water Transfer Committee will be considered by the **Exchange Contractors'** Board of Directors, and the transfer approved, disapproved, or returned to the Water Transfer Committee for further action as directed by the Board.

Appendix A

Insert technical criteria for Drainage Plan transfers not involving exchange of water.


GRASSLAND DRAINAGE AREA
IN-VALLEY TREATMENT SYSTEM
San Luis & Delta-Mendota Water Authority
GRASSLAND DRAINAGE AREA
SUMMERS ENGINEERING, INC.
JULY 2002
LEGEND
MADERA COUNTY
FRESNO COUNTY
Firebaugh
Mendota
Oro Loma
CALIFORNIA AQUEDUCT
SAN DIEGO RD.
RUSSELL AVE.

SAN LUIS CANAL COMPANY
FALLOWING PROGRAM GUIDELINES

These guidelines set for the requirements of the company-wide volunteer-based Fallowing Program. The guidelines are valid until further changes have been approved by the Board of Directors.

1. RULES AND REGULATIONS

1.01 All fallow transfer shall be subject to the San Luis Canal Company's (Company) current Water Transfer Policy, the San Joaquin River Exchange Contractors Water Authority (Exchange Contractors) current transfer policy and current environmental documentation.

1.02 Said transfer is between the Company (transferor) and a potential buyer (transferee) as defined in the policies mentioned in Section 1.01 above.

2. ELIGIBLE PARTICIPANTS

2.01 The program participant may be the shareholder, the shareholder designee, or the tenant. If there is a Shareholder/Tenant relationship, both must sign the fallowing application and have a signed Authorization and Agreement on file. Any issues that arise between a Shareholder and their tenant(s) will not be reviewed or resolved by the Company.

3. RELINQUISHMENT OF RIGHT TO RECEIVE WATER

3.01 The Participant relinquishes for the duration of the approved transfer the right to receive from the Company the water supply that is the subject of the approved transfer for use on the land within the Company's service area. Also, the Participant's land, which is subject to the approved transfer, relinquishes all water allocations made by the Company for the participating year.

3.02 The Participant agrees to fallow property which lies within the service area of the Company which would have been entitled to receive all of the transferred fallowed water.

4. FALLOWING DEFINITION

4.01 The word "fallow" as used herein shall mean that there will be no applied water between January 1st and December 31st on participating lands. "Fallow" is further defined as not irrigating with:

a. Company water supply
b. Tail water return flows either from the Participants properties or Company sources
c. Well water
d. Tile water discharges
e. Dairy lagoon water
f. Any sources other than rainfall

5. PARTICIPANT TO INDEMNIFY COMPANY

5.01 The Participant agrees to defend, indemnify, and hold harmless the Company from any claims that the Company transfer violates the rights of any tenants or other persons having any interest in the Participants land.

6. TRANSFER TERMS

6.01 The Company will negotiate with potential buyers to determine the amount of water in acre feet (AF) to be transferred.

6.02 The Company will negotiate with potential buyers to determine the selling price on a dollar amount per AF or a dollar amount per acre basis.

6.03 After the Company has negotiated the terms in 6.01 and 6.02, the Company will work closely with the Landowners to explain the terms and conditions.

7. PARTICIPANT OBLIGATIONS

7.01 Proper Cultivation: Participant agrees that the fallowed land will be kept clear of weeds or noxious plant life so that the same will not be allowed to go to seed, and free of insect or disease conditions, which may impact those neighboring lands.

7.02 Crop Status: Participant agrees that fallowed land planted in Winter Crops, Safflower or Alfalfa will comply with specified disk down or harvest dates.

7.03 Non-Compliance: Participant agrees that if he/she fails to comply with the provisions of 7.01 and 7.02 that the Company will terminate the individual's participation in the program. If such a determination was made, the Company could follow through with the two options stated below, or any other type of remedy deemed appropriate:

a. Withhold the balance owed as described in Section 8 below to the Participant for their portion of the fallowed transfer receipts.
b. Hire an outside contractor to perform the necessary work on the Participants property so that the land is kept in a weed free and pest free environment. The cost of such work would then be billed against fallowed transfer receipts owed to the Participant as described in Section 8 below.

8. COMPANY OBLIGATIONS

8.01 The Company will make the land fallowing payments to the Participants as follows: Payment will be dispensed to the Participants when the money is collected through the San Joaquin River Exchange Contractors Water Authority. The total payment, which will be 100% of the net proceeds, will be sent to the Participants no later than September 1st of participating year.

9. TECHNICAL STANDARDS AND GUIDELINES

9.01 Maximum Quantity of Transferable Water: The Consumptive Use calculation is derived from the San Joaquin River Exchange Contractors Water Authority Land Fallowing and Technical Standards Guidelines. These guidelines were developed in accordance with the rules and regulations of the U.S. Bureau of Reclamation. The consumptive use will be calculated using the average of the crops grown on the land for the past three water years.

9.02 Participating Acreage Determination

a. Net farmed acres
b. Partial fields will be allowed to be fallowed as long as they are contiguous within the field
c. Random fallowing of separate, non-contiguous portions, of one field will not be allowed
d. The minimum allowable field size is 5 acres
e. Duck Club lands and permanent pasture lands are ineligible

POLICY GOVERNING THE SAN LUIS CANAL COMPANY'S WELL WATER EXCHANGE PROGRAM

San Luis Canal Company (SLCC) receives its surface water supplies from the United States Bureau of Reclamation (USBR), pursuant to the "Second Amended Contract for Exchange of Waters" (revised December 6th, 1967). As a result of variability in hydrology, declining reliability in the Delta and/or implementation of regulations limiting the supply of South of Delta Agricultural Service Contractors neighboring SLCC, the Board has developed a Well Water Exchange Program (Program) to provide water resource reliability to its Shareholders. The Program will allow Shareholders to pump groundwater supplies into the Henry Miller Reclamation District (HMRD) conveyance system, and exchange a like amount of surface water allocation (less applicable losses) to a Recipient District, defined below. The remainder of this policy outlines the rules and regulations of said Program.

1. Definitions
    a. Company: The San Luis Canal Company
    b. In-District: Any ground in the SLCC service area with current SLCC issued Stock Certificates.
    c. Shareholder: One who owns land within the SLCC service area with current SLCC issued Stock Certificates. Shareholder includes entities to which the Shareholder is a member or owner such a trust, corporation, partnership, and limited liability company.
    d. Recipient District:
        i. A District or mutual water company within the geographical area described in the San Joaquin River Exchange Contractors Water Authority's 25-year Transfer Program, or
        ii. A District or mutual water company approved in future transfer programs conducted and approved by the San Joaquin River Exchange Contractors Water Authority and USBR

2. General

    Except as noted, these rules shall apply to all well water pumped for exchange to Recipient Districts from in-District wells. Where applicable, the requirements of the SLCC Water Transfer Policy and the San Joaquin River Exchange Contractors Water Authority Water Transfer Policy and Drainage Transfer Policy shall apply to this program. In order to avoid unreasonable impacts on the water supply, operations, and financial condition of the SLCC and its water users, the SLCC will not approve a proposal to pump well water for exchange unless:

    a. The Recipient District conducts a water conservation program that includes efficient water management practices, or is in compliance with an urban water management plan under Water Code Section 10610 et seq, an urban water shortage contingency plan under Water Code Sections 10621, 10631 and 10656, or an agricultural water management plan adopted pursuant to Water Code Section 10800 et seq.; and
    b. The Recipient District conducts a drainage program which in the sole determination of SLCC assures that the water transfer will not cause a deleterious effect on lands downslope from any lands irrigated as a result of the transfer; and
    c. The Shareholder demonstrates that it will not be dependent upon the transferred water supply at the end of the term of the proposed transfer; and
    d. Exchange requests will be approved no more than 2 out of 3 consecutive years. Alteration in the Shareholder identity, the well ownership, or the ownership of the land to receive the credit will not avoid this rule. Any Shareholder may not be subscribed in the program for any purpose for three (3) consecutive years.

3. Water Quality Requirements

All water pumped must meet water quality standards as established by the Board of Directors. Currently, the maximums allowed are:

a. EC 2,000 uS/cm
b. Boron - 2.0 ppm
c. Selenium - 2.0 ppb

The *Policy Governing the San Luis Canal Company's Water Quality Testing Procedure* will be applicable to this policy.

4. Eligibility

Exchanged water may only be used by a Shareholder and the Shareholder's immediate family as defined herein who owns both the land in the Recipient District, and the land located in the SLCC service area encompassing the private well. Permission to pump a well for exchange will be granted to only one owner during the year; permission cannot be transferred to another owner. Shareholder must have held both interests, title to the land in the Recipient District and SLCC, for a minimum of one year prior to January 1st of the year that the exchange is proposed to occur. If a Shareholder owns the land in SLCC on January 1 of the year in which the transfer is proposed and said Shareholder was the tenant upon the property in the previous full year and held a written option to purchase, the Shareholder shall be treated as complying with this requirement. The parents, natural or adopted children, brother, sister, mother in-law, father in-law, spouse, and grandchildren of a Shareholder, will be treated as identical with the Shareholder for the purposes of this policy. If ownership is in an entity such as a corporation or partnership, the Shareholder's percentage of ownership may limit the amount of water transferable.

5. Quantity Limitations

Limitations to the eligible amount pumped for exchange shall be governed by the following:

a. A shareholder will be allowed to exchange no more than an amount of groundwater which can be pumped without damaging other shareholders, or negatively impacting groundwater storage, as determined solely by SLCC. This amount is currently estimated at 1.5 acre-feet per acre. Acreage for this calculation will include land owned by the shareholder and contiguous to the parcel where the well is located. This amount of groundwater pumped for exchange purposes may be curtailed based upon observed impacts or new information regarding groundwater conditions.
b. A shareholder shall be allowed to exchange the deficit in allocation of the Recipient District. Deficit is defined as the difference of 3 acre-foot per acre allocation or the Recipient District full allocation and the current years actual allocation percentage, applied to the acreage of the holding in the Recipient District.
c. In years which the SLCC allocates water, in no case shall the exchanged water exceed the per-acre allocation for SLCC's Shareholders.
d. SLCC may determine the eligible amount for Exchange by any of the methods above, a combination thereof or any other method adopted by the SLCC Board of Directors.

6. Authority to Terminate or Curtail Pumping - Exchange pumping shall be terminated if the pumping has a detrimental impact on neighboring wells, or on the groundwater table. In case of a dispute over claims of detrimental impacts, a determination will be made by an independent groundwater consultant chosen by the SLCC, whose decision will be final. If a non-detrimental determination is made, the Shareholder initiating the dispute will be responsible for all consultant costs. If a detrimental determination is made, the Shareholder exchanging the water will be responsible for all consultant costs. Curtailment of groundwater exchange amounts may occur during the water year, at the sole discretion of the SLCC. In no case will private wells pumping from the sub-Corcoran layer (deep pumping) be eligible for participation in this program. Enrollment in the Program will be denied and/or terminated at any time if the exchange pumping creates any detrimental impacts as determined by the San Joaquin River Exchange Contractor's Water Authority Groundwater Sustainability Agencies Groundwater Sustainability Plan (GSP), implemented in accordance with the Sustainable Groundwater Management Act of 2014. Enrollment is further contingent on any applicable County ordinances, and any other jurisdictional agency requirements.

7. SLCC Usage - Pumping into HMRD canals will be allowed only when the exchange water can be efficiently used for SLCC water demands.
    a. SLCC's surface water supply delivered by the USBR is generally restricted in monthly quantity. Consequently, unless the water year is such that SLCC is accorded water supply delivery flexibility, all well pumping exchanges must be exchanged to the Recipient District in the same month in which the water is pumped. SLCC shall have complete discretion and control on operations of the well.
    b. A 10% loss factor will be applied to all well water pumped for credit under this policy.
    c. All wells in the Program must have a meter acceptable to HMRD.

8. SLCC Charges - There will be an administrative fee of $20.00 per acre-foot pumped. Other charges to transport well water for credit will be as follows:
    a. Water Quality
        i. 0 to 1,000 EC: No charge
        ii. 1,000 to 2,000 EC: $5.00/AF
    b. Any other fees or charges assessed by the USBR, or the Recipient District will be the responsibility of the Shareholder.
    c. These fees shall be reviewed annually by the Board of Directors and may be revised at that time.

9. Release of Liability – By enrolling in the Program, Shareholder agrees to hold SLCC harmless against:
    a. Claims for damage to the groundwater table from adjacent Shareholders.
    b. Claims for damages incurred by the Shareholder, in the event the permission to pump for exchange is revoked or cancelled.
    c. Wear and tear to the pump and motor and damages not the fault of SLCC.
    d. Any problems or unforeseen circumstances that may arise under this program.

10. Severability - Enrollment in this Program may be revoked if any of the above terms and conditions are violated, and /or at the sole discretion of the SLCC.

Revised December 15, 2022

Attachment C

Measurement Device Documentation

Flow rate Volumetric Accuracy

San Luis Canal Company uses Standard flow measurement devices: metergates combined with excellent water level control using mainly long crested weir, ITRC Flap gates and automated Langeman gates and Lopac gates, and flowmeters on privately owned drip/micro filter stations.

Attached are:

1. Turnout calibration Equations.

   Discharge Data Tables are attached for the array of type and sizes of turnout gates installed throughout the district. (Attachment C2)

2. All the flow rate verification calculation sheets are attached and a summary table explains the procedure to determine the combined volumetric error measured on 15 turnouts. Photos are attached for the bulked structures and gates installed in the district. (Attachment C3)

3. All the flow rate verification calculation sheets are attached and a summary table explains the procedure to determine the combined volumetric error measured on 15 flowmeters. Photos are attached for the flowmeters installed in the district. (Attachment C4)

Volumetric Error for 15 randomly selected meter gates

Turnout #	Turnout Name	Device Type	IFR, %	CWLF, %	CBP, %	ARD, %	Volumetric Error, %
124	DE196+048L	Meter Gate	2.3%	0.05%	0.02%	0.04%	2.27%
128	DE223+080L	Meter Gate	-8.0%	0.05%	0.02%	0.04%	7.97%
519	TO066+041R A	Meter Gate	1.7%	0.05%	0.02%	0.04%	1.70%
524	TS087+060L	Meter Gate	0.6%	0.05%	0.02%	0.04%	0.62%
462	SW029+029R	Meter Gate	2.0%	0.05%	0.02%	0.04%	1.96%
468	SW103+025R	Meter Gate	-9.3%	0.05%	0.02%	0.04%	9.27%
125	DE208+028L	Meter Gate	-9.3%	0.05%	0.02%	0.04%	9.32%
127	DE208+067L	Meter Gate	4.8%	0.05%	0.02%	0.04%	4.84%
140	DE477+046R	Meter Gate	0.9%	0.05%	0.02%	0.04%	0.87%
511	TO007+083L	Meter Gate	4.4%	0.05%	0.02%	0.04%	4.36%
201	GO044+019R	Meter Gate	-8.4%	0.05%	0.02%	0.04%	8.43%
246	LT062+081L	Meter Gate	-1.6%	0.05%	0.02%	0.04%	1.63%
517	SJ189+069R	Meter Gate	-8.1%	0.05%	0.02%	0.04%	8.12%
99	D1065+043R	Meter Gate	9.0%	0.05%	0.02%	0.04%	9.03%
295	MI141+081R	Meter Gate	4.2%	0.05%	0.02%	0.04%	4.23%

- IFR – Instantaneous flow rate error
- CWLF – Canal water level fluctuations, or pipeline pressure fluctuations over time.

The impact of these fluctuations are mostly self-canceling over the course of an irrigation season.
This is discussed later in this report.

- CBP – Changes in "backpressure". Backpressure is the pressure on the downstream side of the flow measurement device.
- ARD – Accuracy of the recording of durations. For example, if an actual delivery lasts for a total of 25 hours but it is recorded and billed as a 24-hour delivery, this would be an error of one hour, or 4.2%

Combined Vol. Error = $\sqrt{(IFR)^2 + (CWLF)^2 + (CBP)^2 + (ARD)^2}$

The Canal Water Level fluctuation error (CWLF) was assumed as 0.2% as per the anaysis developd by Cal poly ITRC on the SBX 7-7 Compliance for Agricultural Irrigation Districts Paper which used San Luis canal Compamny's data set to demonstrate that more than 10 irrigations per seasaon the annual volumetric error is about +/- 0.5%

ITRC

moving water in new directions

IRRIGATION TRAINING & RESEARCH CENTER

SBx7 Flow Rate Measurement Program Verification for San Luis Canal Company

Department of Water Resources

October 2012

**IRRIGATION
TRAINING &
RESEARCH
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RCE 28995 - Issued July 12, 1978

Signed 10/18/2012

Disclaimer:

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Irrigation Training & Research Center
October 18, 2012

EXECUTIVE SUMMARY

1. San Luis Canal Company (SLCC) took a strong proactive approach toward both verifying and improving farm delivery turnout volumetric measurement in response to SBx7-7.

Based on the results of its field verification, SLCC meets the SBx7-7 accuracy criteria for volumetric for measurement at delivery gates.

2. To meet the SBx7-7 requirements of 88% accuracy of <u>volume</u> measurement, SLCC must demonstrate an instantaneous <u>flow rate</u> measurement error of less than about 11% on at least 75% of the sampled area (**Table 1**).

Table 1. Comparison of SBx7-7 and SLCC test results

Item		SBx7 Minimum Requirement	SLCC Results	Meets Criteria?
Area served, acres			40,190	
Required sample size - instantaneous flow rate measurement on this % of the acreage or volume of the district.	Propeller Meter	10	15.8	Yes
	Metergate	10	10.3	Yes
	Total (weighted)	10%	11.2%	Yes
Minimum number of devices of each type of test	# of Propeller Meters Tested	5	5	Yes
	# of Metergates Tested	5	52	Yes
% of the sample volume (area) required to meet the standard	Propeller Meter	75	80	Yes
	Metergate	75	84	Yes

3. During the summer verification process, SLCC identified several key factors that did, or still do, contribute to flow rate measurement inaccuracies. These included:
    a. Improper definition of the metergate stem height at "zero" opening
    b. Improper location of the downstream pressure measurement
    c. Improper calibration tables for some metergates

4. SLCC realizes that good volumetric measurement is important for the district. Therefore, SLCC is planning to support Cal Poly ITRC laboratory investigations to identify the correction factors for items 3(b) and 3(c), above. The appropriate corrections will be loaded into the SLCC portable scanners that are used by the operators, so that measurement accuracy will improve.

5. SLCC plans to embark on a program of marking all metergate stem heights to the correct "zero" position - as opposed to using a gate stem height correction factor in its computations.

6. SLCC plans to continue a program of metergate standardization for all new/repair gates.

Attachment C2

Measurement Device Documentation

Discharge Tables from Metergate Manufacturers

12" DIA. - Waterman C-10 - Type GATE

Head	Net Gate Opening (inches)																
(Inches)	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6.0	7.0	8.0	9.0	10.0	11.0	12.0
1	0.07	0.16	0.25	0.34	0.42	0.48	0.55	0.61	0.67	0.73	0.79	0.85	0.97	1.10	1.20	1.27	1.32	1.34
1 1/4	0.08	0.18	0.28	0.38	0.47	0.54	0.61	0.68	0.75	0.81	0.89	0.96	1.09	1.23	1.34	1.42	1.47	1.50
1 1/2	0.09	0.20	0.31	0.42	0.51	0.59	0.67	0.74	0.82	0.89	0.97	1.05	1.19	1.35	1.46	1.56	1.61	1.64
1 3/4	0.09	0.21	0.33	0.45	0.55	0.64	0.72	0.80	0.88	0.96	1.05	1.13	1.28	1.46	1.58	1.68	1.74	1.77
2	0.10	0.23	0.36	0.49	0.59	0.68	0.77	0.86	0.94	1.03	1.12	1.21	1.37	1.56	1.69	1.80	1.86	1.89
2 1/4	0.10	0.24	0.38	0.52	0.63	0.72	0.82	0.91	1.00	1.09	1.19	1.28	1.46	1.66	1.79	1.91	1.98	2.01
2 1/2	0.11	0.25	0.40	0.54	0.66	0.76	0.87	0.96	1.06	1.15	1.25	1.35	1.53	1.74	1.89	2.01	2.08	2.12
2 3/4	0.12	0.26	0.42	0.57	0.69	0.80	0.91	1.00	1.11	1.20	1.31	1.42	1.61	1.83	1.98	2.11	2.19	2.22
3	0.12	0.28	0.44	0.60	0.72	0.84	0.95	1.05	1.16	1.26	1.37	1.48	1.68	1.91	2.07	2.21	2.28	2.32
3 1/4	0.13	0.29	0.45	0.62	0.75	0.87	0.99	1.09	1.20	1.31	1.43	1.54	1.75	1.99	2.16	2.30	2.38	2.41
3 1/2	0.13	0.30	0.47	0.64	0.78	0.90	1.02	1.13	1.25	1.36	1.48	1.60	1.82	2.06	2.24	2.38	2.47	2.50
3 3/4	0.14	0.31	0.49	0.67	0.81	0.94	1.06	1.17	1.29	1.41	1.53	1.66	1.88	2.14	2.32	2.47	2.55	2.59
4	0.14	0.32	0.50	0.69	0.84	0.97	1.09	1.21	1.34	1.45	1.58	1.71	1.94	2.21	2.39	2.55	2.64	2.68
4 1/4	0.14	0.33	0.52	0.71	0.86	1.00	1.13	1.25	1.38	1.50	1.63	1.76	2.00	2.27	2.46	2.63	2.72	2.76
4 1/2	0.15	0.34	0.53	0.73	0.89	1.03	1.16	1.28	1.42	1.54	1.68	1.81	2.06	2.34	2.54	2.70	2.80	2.84
4 3/4	0.15	0.35	0.55	0.75	0.91	1.05	1.19	1.32	1.46	1.58	1.73	1.86	2.12	2.40	2.61	2.78	2.87	2.92
5	0.16	0.36	0.56	0.77	0.93	1.08	1.22	1.35	1.49	1.62	1.77	1.91	2.17	2.47	2.67	2.85	2.95	2.99
5 1/2	0.16	0.37	0.59	0.81	0.98	1.13	1.28	1.42	1.57	1.70	1.86	2.00	2.28	2.59	2.80	2.99	3.09	3.14
6	0.17	0.39	0.62	0.84	1.02	1.18	1.34	1.48	1.64	1.78	1.94	2.09	2.38	2.70	2.93	3.12	3.23	3.28
6 1/2	0.18	0.41	0.64	0.88	1.06	1.23	1.40	1.54	1.70	1.85	2.02	2.18	2.47	2.81	3.05	3.25	3.36	3.41
7	0.19	0.42	0.66	0.91	1.10	1.28	1.45	1.60	1.77	1.92	2.10	2.26	2.57	2.92	3.16	3.37	3.49	3.54
7 1/2	0.19	0.44	0.69	0.94	1.14	1.32	1.50	1.66	1.83	1.99	2.17	2.34	2.66	3.02	3.27	3.49	3.61	3.67
8	0.20	0.45	0.71	0.97	1.18	1.37	1.55	1.71	1.89	2.06	2.24	2.42	2.75	3.12	3.38	3.60	3.73	3.79
8 1/2	0.20	0.46	0.73	1.00	1.22	1.41	1.60	1.76	1.95	2.12	2.31	2.49	2.83	3.22	3.49	3.71	3.84	3.90
9	0.21	0.48	0.75	1.03	1.25	1.45	1.64	1.82	2.00	2.18	2.38	2.56	2.91	3.31	3.59	3.82	3.96	4.02
9 1/2	0.22	0.49	0.77	1.06	1.29	1.49	1.69	1.87	2.06	2.24	2.44	2.63	2.99	3.40	3.68	3.93	4.06	4.13
10	0.22	0.50	0.79	1.09	1.32	1.53	1.73	1.91	2.11	2.30	2.50	2.70	3.07	3.49	3.78	4.03	4.17	4.23
11	0.23	0.53	0.83	1.14	1.39	1.60	1.82	2.01	2.22	2.41	2.63	2.83	3.22	3.66	3.97	4.22	4.37	4.44
12	0.24	0.55	0.87	1.19	1.45	1.67	1.90	2.10	2.31	2.52	2.74	2.96	3.36	3.82	4.14	4.41	4.57	4.64
13	0.25	0.57	0.91	1.24	1.51	1.74	1.97	2.18	2.41	2.62	2.86	3.08	3.50	3.98	4.31	4.59	4.75	4.83
14	0.26	0.60	0.94	1.29	1.56	1.81	2.05	2.26	2.50	2.72	2.96	3.20	3.63	4.13	4.47	4.77	4.93	5.01
15	0.27	0.62	0.97	1.33	1.62	1.87	2.12	2.34	2.59	2.81	3.07	3.31	3.76	4.27	4.63	4.93	5.11	5.19
16	0.28	0.64	1.00	1.37	1.67	1.93	2.19	2.42	2.67	2.91	3.17	3.42	3.88	4.41	4.78	5.09	5.27	5.36
17	0.29	0.66	1.04	1.42	1.72	1.99	2.26	2.50	2.75	3.00	3.27	3.52	4.00	4.55	4.93	5.25	5.44	5.52
18	0.30	0.68	1.07	1.46	1.77	2.05	2.32	2.57	2.83	3.08	3.36	3.63	4.12	4.68	5.07	5.40	5.59	5.68
19	0.30	0.69	1.09	1.50	1.82	2.11	2.39	2.64	2.91	3.17	3.45	3.73	4.23	4.81	5.21	5.55	5.75	5.84
20	0.31	0.71	1.12	1.54	1.87	2.16	2.45	2.71	2.99	3.25	3.54	3.82	4.34	4.93	5.35	5.70	5.90	5.99
21	0.32	0.73	1.15	1.57	1.91	2.21	2.51	2.77	3.06	3.33	3.63	3.92	4.45	5.06	5.48	5.84	6.04	6.14
22	0.33	0.75	1.18	1.61	1.96	2.27	2.57	2.84	3.13	3.41	3.71	4.01	4.55	5.18	5.61	5.97	6.18	6.28
23	0.34	0.76	1.20	1.65	2.00	2.32	2.63	2.90	3.20	3.48	3.80	4.10	4.66	5.29	5.73	6.11	6.32	6.42
24	0.34	0.78	1.23	1.68	2.05	2.37	2.68	2.96	3.27	3.56	3.88	4.19	4.76	5.41	5.86	6.24	6.46	6.56
25	0.35	0.80	1.26	1.72	2.09	2.42	2.74	3.03	3.34	3.63	3.96	4.27	4.85	5.52	5.98	6.37	6.59	6.69

12" DIA. - Waterman C-10 - Type GATE

Head	Net Gate Opening (inches)																
(Inches)	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6.0	7.0	8.0	9.0	10.0	11.0	12.0
26	0.36	0.81	1.28	1.75	2.13	2.46	2.79	3.09	3.41	3.70	4.04	4.36	4.95	5.63	6.10	6.49	6.72	6.83
27	0.36	0.83	1.31	1.79	2.17	2.51	2.84	3.14	3.47	3.78	4.11	4.44	5.04	5.73	6.21	6.62	6.85	6.96
28	0.37	0.84	1.33	1.82	2.21	2.56	2.90	3.20	3.53	3.84	4.19	4.52	5.14	5.84	6.33	6.74	6.98	7.09
29	0.38	0.86	1.35	1.85	2.25	2.60	2.95	3.26	3.60	3.91	4.26	4.60	5.23	5.94	6.44	6.86	7.10	7.21
30	0.38	0.87	1.38	1.88	2.29	2.65	3.00	3.31	3.66	3.98	4.34	4.68	5.32	6.04	6.55	6.98	7.22	7.33
31	0.39	0.89	1.40	1.91	2.33	2.69	3.05	3.37	3.72	4.05	4.41	4.76	5.40	6.14	6.66	7.09	7.34	7.45
32	0.40	0.90	1.42	1.94	2.36	2.73	3.10	3.42	3.78	4.11	4.48	4.84	5.49	6.24	6.76	7.20	7.46	7.57
33	0.40	0.91	1.44	1.97	2.40	2.78	3.15	3.48	3.84	4.17	4.55	4.91	5.58	6.34	6.87	7.32	7.57	7.69
34	0.41	0.93	1.46	2.00	2.44	2.82	3.19	3.53	3.89	4.24	4.62	4.98	5.66	6.43	6.97	7.43	7.69	7.81

15" DIA. - Waterman C-10 - Type GATE

Head	Net Gate Opening (inches)																				
(Inches)	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10	11	12	13	14	15
1	0.09	0.20	0.32	0.46	0.57	0.66	0.75	0.83	0.91	0.98	1.07	1.14	1.30	1.43	1.58	1.71	1.84	1.94	2.04	2.13	2.18
1 1/4	0.10	0.22	0.35	0.51	0.62	0.73	0.83	0.92	1.02	1.09	1.19	1.27	1.44	1.59	1.75	1.90	2.05	2.17	2.29	2.38	2.43
1 1/2	0.10	0.24	0.38	0.55	0.67	0.79	0.91	1.00	1.11	1.19	1.30	1.38	1.57	1.74	1.91	2.08	2.24	2.38	2.51	2.62	2.67
1 3/4	0.11	0.26	0.41	0.59	0.72	0.85	0.98	1.08	1.19	1.28	1.39	1.49	1.68	1.87	2.06	2.24	2.41	2.57	2.72	2.83	2.90
2	0.12	0.28	0.44	0.63	0.77	0.90	1.04	1.15	1.27	1.37	1.48	1.59	1.79	1.99	2.20	2.39	2.58	2.75	2.90	3.03	3.09
2 1/4	0.13	0.29	0.46	0.67	0.81	0.95	1.10	1.22	1.34	1.45	1.57	1.48	1.89	2.11	2.33	2.54	2.73	2.91	3.07	3.22	3.28
2 1/2	0.13	0.31	0.49	0.70	0.85	1.00	1.15	1.28	1.41	1.53	1.65	1.76	1.99	2.22	2.45	2.68	2.87	3.07	3.24	3.40	3.46
2 3/4	0.14	0.32	0.51	0.73	0.89	1.05	1.20	1.33	1.48	1.60	1.73	1.84	2.09	2.33	2.57	2.81	3.01	3.21	3.40	3.57	6.64
3	0.14	0.33	0.53	0.76	3.93	1.09	1.25	1.38	1.54	1.67	1.80	1.92	2.18	2.43	2.69	2.93	3.14	3.35	3.54	3.73	3.81
3 1/4	0.15	0.35	0.55	0.79	0.97	1.13	1.29	1.43	1.60	1.73	1.87	2.00	2.27	2.53	2.80	3.05	3.27	3.49	3.68	3.88	3.97
3 1/2	0.15	0.36	0.57	0.82	1.00	1.17	1.33	1.48	1.65	1.79	1.94	2.08	2.36	2.63	2.90	3.17	3.39	3.62	3.82	4.01	4.11
3 3/4	0.16	0.37	0.59	0.85	1.03	1.21	1.37	1.53	1.70	1.85	2.01	2.15	2.44	2.72	3.00	3.28	3.51	3.75	3.96	4.14	4.25
4	0.16	0.38	0.61	0.88	1.06	1.25	1.41	1.58	1.75	1.91	2.07	1.22	2.52	2.81	3.10	3.39	3.63	3.87	4.09	4.27	4.39
4 1/4	0.17	0.39	0.63	0.91	1.09	1.29	1.45	1.63	1.80	1.97	2.13	2.29	2.60	2.90	3.20	3.49	3.74	3.99	4.21	4.40	4.53
4 1/2	0.17	0.40	0.64	0.93	1.12	1.32	1.49	1.68	1.85	2.03	2.19	2.36	2.68	2.98	3.29	3.59	3.85	4.10	4.33	4.53	4.67
4 3/4	0.18	0.41	0.66	0.95	1.15	1.35	1.53	1.73	1.90	2.09	2.25	2.42	2.75	3.06	3.38	3.69	3.96	4.21	4.45	4.65	4.80
5	0.18	0.42	0.67	0.97	1.18	1.38	1.57	1.77	1.95	2.14	2.31	2.48	2.82	3.14	3.47	3.79	4.06	2.32	4.57	4.77	4.92
5 1/2	0.19	0.44	0.70	1.01	1.23	1.44	1.64	1.85	2.05	2.24	2.43	2.60	2.96	3.30	3.63	3.97	4.26	4.54	4.79	5.00	5.14
6	0.20	0.46	0.73	1.05	1.28	1.50	1.71	1.93	2.14	2.34	2.54	2.72	3.09	3.44	3.79	4.15	4.44	4.74	5.00	5.22	5.36
6 1/2	0.20	0.48	0.76	1.09	1.33	1.56	1.78	2.01	2.23	2.44	2.64	2.83	3.22	3.58	3.95	4.32	4.62	4.93	5.20	5.43	5.58
7	0.21	0.49	0.79	1.13	1.38	1.62	1.85	2.09	2.31	2.53	2.74	2.93	3.34	3.72	4.10	4.48	4.79	5.11	5.40	5.64	5.79
7 1/2	0.22	0.51	0.81	1.17	1.42	1.68	1.92	2.16	2.39	2.62	2.84	3.03	3.46	2.85	4.25	4.64	4.96	5.29	5.59	5.84	5.99
8	0.23	0.53	0.84	1.21	1.46	1.73	1.98	2.23	2.47	2.71	2.93	3.13	3.57	2.98	4.39	4.79	5.13	5.47	5.78	6.03	6.19
8 1/2	0.23	0.54	0.86	1.24	1.50	1.78	2.04	2.30	2.55	2.79	3.02	3.23	3.68	4.10	4.52	4.93	5.29	5.64	5.95	6.22	6.38
9	0.24	0.55	0.88	1.27	1.54	1.83	2.10	2.37	2.62	2.87	3.11	3.33	3.79	4.22	4.65	5.07	5.44	5.80	6.12	6.40	6.56
9 1/2	0.24	0.57	0.91	1.30	1.58	1.88	2.16	2.43	2.69	2.95	3.19	3.42	3.89	4.34	4.78	5.21	5.59	5.96	6.29	6.58	6.74
10	0.25	0.58	0.93	1.33	1.62	1.93	2.22	2.49	2.76	3.03	3.27	3.51	3.99	4.45	4.91	5.35	5.73	6.11	6.46	6.75	6.92
11	0.26	0.61	0.97	1.39	1.70	2.03	2.32	2.61	2.90	3.17	3.43	3.68	4.18	4.66	5.14	5.61	6.01	6.41	6.77	7.07	7.26
12	0.27	0.64	1.02	1.45	1.78	2.12	2.42	2.73	3.03	3.31	3.59	3.84	4.37	4.87	5.37	5.86	6.29	6.70	7.07	7.39	7.59
13	0.29	0.66	1.06	1.50	1.85	2.21	2.52	2.84	3.15	3.45	3.73	4.00	4.55	5.07	5.59	6.10	6.54	6.97	7.36	7.69	7.89
14	0.30	0.69	1.10	1.55	1.92	2.29	2.62	2.95	2.37	3.58	3.87	4.15	4.72	5.26	5.80	6.34	6.79	7.24	7.64	7.98	8.19
15	0.31	0.71	1.13	1.60	1.99	2.37	2.71	3.05	3.38	3.70	4.01	4.30	4.88	5.44	6.00	6.56	7.03	7.49	7.91	8.26	8.47
16	0.32	0.73	1.17	1.65	2.05	2.45	2.80	3.15	3.49	3.82	4.14	4.44	5.04	5.62	6.20	6.77	7.26	7.73	8.17	8.53	8.75
17	0.32	0.76	1.20	1.70	2.11	2.52	2.89	3.25	3.60	3.94	4.27	4.57	5.20	5.80	6.39	6.98	7.48	7.97	8.42	8.80	9.02
18	0.33	0.78	1.24	1.75	2.17	2.59	2.97	3.34	3.70	4.05	4.39	4.70	5.35	5.96	6.58	7.18	7.69	8.20	8.66	9.05	9.28
19	0.44	0.90	1.35	1.80	2.23	2.65	3.05	3.45	3.80	4.15	4.50	4.85	5.50	6.10	6.80	7.40	7.95	8.45	9.00	9.30	9.60
20	0.46	0.92	1.40	1.85	2.30	2.75	3.15	3.55	3.90	4.25	4.63	5.00	5.70	6.30	7.00	7.60	8.20	8.70	9.25	9.60	9.90
21	0.47	0.96	1.45	1.90	2.35	2.80	3.23	3.65	4.03	4.40	4.78	5.15	5.85	6.50	7.20	7.85	8.40	9.00	9.55	9.90	10.20
22	0.48	0.98	1.48	1.95	2.40	2.85	3.28	3.70	4.08	4.45	4.83	5.20	5.90	6.60	7.30	7.95	8.50	9.10	9.65	10.00	10.35
23	0.49	1.00	1.50	1.97	2.44	2.90	3.33	3.75	4.13	4.50	4.90	5.30	5.95	6.70	7.40	8.05	8.60	9.20	9.80	10.20	10.50
24	0.50	1.15	1.51	2.00	2.48	2.95	3.40	3.85	4.23	4.60	5.00	5.40	6.15	6.85	7.60	8.30	8.85	9.45	10.10	10.40	10.70

18" DIA. - Waterman C-10 - Type GATE

Head	Net Gate Opening (inches)																						
(Inches)	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10	11	12	13	14	15	16	17	18
1/2	0.07	0.16	0.25	0.35	0.44	0.52	0.61	0.68	0.75	0.81	0.87	0.93	1.05	1.17	1.29	1.40	1.54	1.67	1.81	1.95	2.05	2.14	2.17	2.17
3/4	0.08	0.20	0.31	0.43	0.54	0.64	0.74	0.84	0.92	1.00	1.07	1.14	1.29	1.43	1.58	1.72	1.88	2.05	2.22	2.39	2.51	2.62	2.66	2.66
1	0.10	0.23	0.36	0.50	0.62	0.74	0.86	0.96	1.06	1.15	1.24	1.31	1.49	1.65	1.82	1.98	2.18	2.36	2.57	2.76	2.90	3.02	3.07	3.07
1 1/4	0.11	0.25	0.40	0.56	0.70	0.83	0.96	1.08	1.19	1.29	1.38	1.47	1.67	1.85	2.04	2.22	2.43	2.64	2.87	3.09	3.24	3.38	3.43	3.43
1 1/2	0.12	0.28	0.44	0.61	0.76	0.91	1.05	1.18	1.30	1.41	1.51	1.61	1.83	2.03	2.23	2.43	2.66	2.89	3.14	3.38	3.55	3.70	3.76	3.76
1 3/4	0.13	0.30	0.48	0.66	0.82	0.98	1.13	1.28	1.40	1.52	1.63	1.73	1.97	2.19	2.41	2.62	2.88	3.12	3.39	3.65	3.84	4.00	4.06	4.06
2	0.14	0.32	0.51	0.70	0.88	1.05	1.21	1.36	1.50	1.63	1.75	1.85	2.11	2.34	2.58	2.80	3.08	3.34	3.63	3.90	4.10	4.27	4.34	4.34
2 1/4	0.15	0.34	0.54	0.75	0.93	1.11	1.28	1.45	1.59	1.73	1.85	1.97	2.24	2.48	2.74	2.97	3.26	3.54	3.85	4.14	4.35	4.53	4.60	4.61
2 1/2	0.15	0.36	0.57	0.79	0.98	1.17	1.35	1.52	1.68	1.82	1.95	2.07	2.36	2.62	2.88	3.13	3.44	3.74	4.06	4.36	4.58	4.78	4.85	4.85
2 3/4	0.16	0.37	0.60	0.82	1.03	1.23	1.42	1.60	1.76	1.91	2.05	2.17	2.47	2.74	3.02	3.29	3.61	3.92	4.25	4.58	4.81	5.01	5.08	5.09
3	0.17	0.39	0.62	0.86	1.08	1.28	1.48	1.67	1.84	2.00	2.14	2.27	2.58	2.87	3.16	3.43	3.77	4.09	4.44	4.78	5.02	5.23	5.31	5.32
3 1/4	0.17	0.41	0.65	0.90	1.12	1.34	1.54	1.74	1.91	2.08	2.23	2.36	2.69	2.98	3.29	3.57	3.92	4.26	4.62	4.98	5.23	5.44	5.53	5.54
3 1/2	0.18	0.42	0.67	0.93	1.16	1.39	1.60	1.80	1.99	2.16	2.31	2.45	2.79	3.10	3.41	3.71	4.07	4.42	4.80	5.16	5.42	5.65	5.74	5.74
3 3/4	0.19	0.44	0.70	0.96	1.20	1.44	1.66	1.87	2.06	2.23	2.39	2.54	2.89	3.20	3.53	3.84	4.21	4.57	4.97	5.35	5.62	5.85	5.94	5.95
4	0.19	0.45	0.72	0.99	1.24	1.48	1.71	1.93	2.12	2.30	2.47	2.62	2.98	3.31	3.65	3.96	4.35	4.72	5.13	5.52	5.80	6.04	6.13	6.14
4 1/4	0.20	0.46	0.74	1.02	1.28	1.53	1.76	1.99	2.19	2.38	2.55	2.70	3.07	3.41	3.76	4.09	4.48	4.87	5.29	5.69	5.98	6.23	6.32	6.33
4 1/2	0.21	0.48	0.76	1.05	1.32	1.57	1.82	2.05	2.25	2.44	2.62	2.78	3.16	3.51	3.87	4.20	4.61	5.01	5.44	5.86	6.15	6.41	6.50	6.51
4 3/4	0.21	0.49	0.78	1.08	1.36	1.62	1.87	2.10	2.31	2.51	2.69	2.86	3.25	3.61	3.98	4.32	4.74	5.15	5.59	6.02	6.32	6.58	6.68	6.69
5	0.22	0.50	0.81	1.11	1.39	1.66	1.91	2.16	2.37	2.58	2.76	2.93	3.33	3.70	4.08	4.43	4.86	5.28	5.74	6.17	6.48	6.75	6.86	6.87
5 1/2	0.23	0.53	0.84	1.17	1.46	1.74	2.01	2.26	2.49	2.70	2.90	3.08	3.50	3.88	4.28	4.65	5.10	5.54	6.02	6.47	6.80	7.08	7.19	7.20
6	0.24	0.55	0.88	1.22	1.52	1.82	2.10	2.36	2.60	2.82	3.03	3.21	3.65	4.05	4.47	4.85	5.33	5.79	6.28	6.76	7.10	7.40	7.51	7.52
6 1/2	0.25	0.57	0.92	1.27	1.59	1.89	2.18	2.46	2.71	2.94	3.15	3.34	3.80	4.22	4.65	5.05	5.55	6.02	6.54	7.04	7.39	7.70	7.82	7.83
7	0.26	0.60	0.95	1.31	1.65	1.96	2.26	2.55	2.81	3.05	3.27	3.47	3.94	4.38	4.83	5.24	5.75	6.25	6.79	7.30	7.67	7.99	8.11	8.12
7 1/2	0.26	0.62	0.99	1.36	1.70	2.03	2.34	2.64	2.91	3.16	3.38	3.59	4.08	4.53	5.00	5.43	5.96	6.47	7.02	7.56	7.94	8.27	8.40	8.41
8	0.27	0.64	1.02	1.41	1.76	2.10	2.42	2.73	3.00	3.26	3.49	3.71	4.22	4.68	5.16	5.61	6.15	6.68	7.25	7.81	8.20	8.54	8.67	8.68
8 1/2	0.28	0.66	1.05	1.45	1.81	2.16	2.50	2.81	3.10	3.36	3.60	3.82	4.35	4.82	5.32	5.78	6.34	6.89	7.48	8.05	8.45	8.81	8.94	8.95
9	0.29	0.68	1.08	1.49	1.87	2.23	2.57	2.89	3.19	3.46	3.71	3.93	4.47	4.96	5.47	5.95	6.53	7.09	7.70	8.28	8.70	9.06	9.20	9.21
9 1/2	0.30	0.69	1.11	1.53	1.92	2.29	2.64	2.97	3.27	3.55	3.81	4.04	4.59	5.10	5.62	6.11	6.70	7.28	7.91	8.51	8.94	9.31	9.45	9.46
10	0.31	0.71	1.14	1.57	1.97	2.35	2.71	3.05	3.36	3.64	3.91	4.15	4.71	5.23	5.77	6.27	6.88	7.47	8.11	8.73	9.17	9.55	9.70	9.71
11	0.32	0.75	1.19	1.65	2.06	2.46	2.84	3.20	3.52	3.82	4.10	4.35	4.94	5.49	6.05	6.57	7.21	7.83	8.51	9.15	9.62	10.02	10.17	10.18
12	0.34	0.78	1.25	1.72	2.15	2.57	2.97	3.34	3.68	3.99	4.28	4.54	5.16	5.73	6.32	6.86	7.53	8.18	8.89	9.56	10.04	10.46	10.62	10.64
13	0.35	0.81	1.30	1.79	2.24	2.67	3.09	3.48	3.83	4.15	4.45	4.73	5.37	5.96	6.58	7.15	7.84	8.52	9.25	9.95	10.45	10.89	11.05	11.07
14	0.36	0.84	1.35	1.86	2.33	2.78	3.20	3.61	3.97	4.31	4.62	4.91	5.58	6.19	6.83	7.41	8.14	8.84	9.60	10.33	10.85	11.30	11.47	11.49
15	0.37	0.87	1.39	1.92	2.41	2.87	3.32	3.73	4.11	4.46	4.78	5.08	5.77	6.41	7.06	7.68	8.42	9.15	9.93	10.69	11.23	11.70	11.87	11.89
16	0.39	0.90	1.44	1.99	2.49	2.97	3.42	3.86	4.25	4.61	4.94	5.25	5.96	6.62	7.30	7.93	8.70	9.45	10.26	11.04	11.60	12.08	12.26	12.28
17	0.40	0.93	1.49	2.05	2.56	3.06	3.53	3.98	4.38	4.75	5.09	5.41	6.15	6.82	7.52	8.17	8.97	9.74	10.58	11.38	11.96	12.45	12.64	12.66
18	0.41	0.96	1.53	2.11	2.64	3.15	3.63	4.09	4.51	4.89	5.24	5.56	6.32	7.02	7.74	8.41	9.23	10.02	10.88	11.71	12.30	12.81	13.01	13.03
19	0.42	0.98	1.57	2.17	2.71	3.23	3.73	4.20	4.63	5.02	5.39	5.72	6.50	7.21	7.95	8.64	9.48	10.30	11.18	12.03	12.64	13.17	13.36	13.38
20	0.43	1.01	1.61	2.22	2.78	3.32	3.83	4.31	4.75	5.15	5.53	5.86	6.67	7.40	8.16	8.86	9.73	10.56	11.47	12.34	12.97	13.51	13.71	13.73
21	0.44	1.03	1.65	2.28	2.85	3.40	3.92	4.42	4.87	5.28	5.66	6.01	6.83	7.58	8.36	9.08	9.97	10.83	11.75	12.65	13.29	13.84	14.05	14.07
22	0.45	1.06	1.69	2.33	2.92	3.48	4.01	4.52	4.98	5.40	5.79	6.15	6.99	7.76	8.56	9.29	10.20	11.08	12.03	12.95	13.60	14.17	14.38	14.40
23	0.46	1.08	1.73	2.38	2.98	3.56	4.11	4.62	5.09	5.53	5.93	6.29	7.15	7.93	8.75	9.50	10.43	11.33	12.30	13.24	13.91	14.48	14.70	14.72
24	0.47	1.10	1.76	2.43	3.05	3.63	4.19	4.72	5.20	5.64	6.05	6.42	7.30	8.10	8.94	9.71	10.66	11.57	12.57	13.52	14.20	14.80	15.02	15.04

S:\Water Operations\2016 Water Operations\ITRC Gate Calculations\Copy of ITRC Waterman C-10 Meter Gate Rating Tables.xlsxWaterman C-10 18"

18” DIA. - Waterman C-10 - Type GATE

Head	Net Gate Opening (inches)																						
(Inches)	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10	11	12	13	14	15	16	17	18
25	0.48	1.13	1.80	2.48	3.11	3.71	4.28	4.82	5.31	5.76	6.18	6.56	7.45	8.27	9.12	9.91	10.88	11.81	12.83	13.80	14.50	15.10	15.33	15.35
26	0.49	1.15	1.84	2.53	3.17	3.78	4.36	4.92	5.41	5.88	6.30	6.69	7.60	8.44	9.30	10.10	11.09	12.05	13.08	14.07	14.79	15.40	15.63	15.66
27	0.50	1.17	1.87	2.58	3.23	3.85	4.45	5.01	5.52	5.99	6.42	6.81	7.75	8.60	9.48	10.30	11.30	12.27	13.33	14.34	15.07	15.69	15.93	15.95
28	0.51	1.19	1.91	2.63	3.29	3.93	4.53	5.10	5.62	6.10	6.54	6.94	7.89	8.75	9.65	10.49	11.51	12.50	13.57	14.61	15.34	15.98	16.22	16.25
29	0.52	1.21	1.94	2.68	3.35	3.99	4.61	5.19	5.72	6.21	6.65	7.06	8.03	8.91	9.82	10.67	11.71	12.72	13.81	14.86	15.61	16.26	16.51	16.53
30	0.53	1.23	1.97	2.72	3.41	4.06	4.69	5.28	5.82	6.31	6.77	7.18	8.16	9.06	9.99	10.85	11.91	12.94	14.05	15.12	15.88	16.54	16.79	16.82
31	0.54	1.26	2.01	2.77	3.46	4.13	4.77	5.37	5.91	6.42	6.88	7.30	8.30	9.21	10.16	11.03	12.11	13.15	14.28	15.37	16.14	16.82	17.07	17.09
32	0.55	1.28	2.04	2.81	3.52	4.20	4.84	5.45	6.01	6.52	6.99	7.42	8.43	9.36	10.32	11.21	12.30	13.36	14.51	15.61	16.40	17.09	17.34	17.37
33	0.56	1.30	2.07	2.85	3.57	4.26	4.92	5.54	6.10	6.62	7.10	7.53	8.56	9.50	10.48	11.38	12.50	13.57	14.73	15.86	16.66	17.35	17.61	17.64
34	0.56	1.31	2.10	2.90	3.63	4.33	4.99	5.62	6.19	6.72	7.20	7.65	8.69	9.65	10.64	11.56	12.68	13.77	14.96	16.09	16.91	17.61	17.88	17.90

24" DIA. - Waterman C-10 - Type GATE

24" DIA. - Waterman C-10 - Type GATE

Head	Net Gate Opening (inches)																												
(Inches)	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1/2	0.10	0.22	0.35	0.49	0.61	0.73	0.84	0.95	1.05	1.14	1.23	1.31	1.49	1.65	1.81	1.96	2.14	2.32	2.45	2.57	2.71	2.85	3.01	3.16	3.30	3.51	3.68	3.71	3.77	3.57
3/4	0.12	0.27	0.43	0.60	0.75	0.89	1.03	1.17	1.29	1.40	1.51	1.61	1.82	2.02	2.22	2.40	2.63	2.84	3.00	3.14	3.32	3.49	3.68	3.87	4.04	4.30	4.51	4.54	4.62	4.37
1	0.14	0.31	0.50	0.69	0.86	1.03	1.19	1.35	1.49	1.62	1.74	1.85	2.10	2.33	2.56	2.78	3.03	3.28	3.46	3.63	3.84	4.03	4.25	4.47	4.67	4.97	5.20	5.24	5.34	5.04
1 1/4	0.15	0.35	0.56	0.77	0.96	1.15	1.33	1.51	1.66	1.81	1.95	2.07	2.35	2.61	2.87	3.10	3.39	3.67	3.87	4.06	4.29	4.51	4.76	4.99	5.22	5.56	5.82	5.86	5.97	5.64
1 1/2	0.17	0.39	0.61	0.84	1.06	1.26	1.46	1.65	1.82	1.98	2.13	2.27	2.58	2.86	3.14	3.40	3.71	4.02	4.24	4.44	4.70	4.94	5.21	5.47	5.72	6.09	6.37	6.42	6.54	6.18
1 3/4	0.18	0.42	0.66	0.91	1.14	1.36	1.58	1.78	1.97	2.14	2.30	2.45	2.78	3.09	3.39	3.67	4.01	4.34	4.58	4.80	5.07	5.33	5.63	5.91	6.17	6.57	6.88	6.93	7.06	6.67
2	0.19	0.44	0.71	0.97	1.22	1.46	1.69	1.91	2.10	2.29	2.46	2.62	2.98	3.30	3.63	3.93	4.29	4.64	4.90	5.13	5.43	5.70	6.02	6.32	6.60	7.03	7.36	7.41	7.55	7.13
2 1/4	0.20	0.47	0.75	1.03	1.29	1.55	1.79	2.02	2.23	2.43	2.61	2.78	3.16	3.50	3.85	4.17	4.55	4.92	5.20	5.44	5.75	6.05	6.38	6.70	7.00	7.45	7.81	7.86	8.01	7.56
2 1/2	0.22	0.50	0.79	1.09	1.36	1.63	1.89	2.13	2.35	2.56	2.75	2.93	3.33	3.69	4.05	4.39	4.80	5.19	5.48	5.74	6.07	6.38	6.73	7.06	7.38	7.86	8.23	8.29	8.44	7.97
2 3/4	0.23	0.52	0.83	1.14	1.43	1.71	1.98	2.23	2.47	2.68	2.89	3.07	3.49	3.87	4.25	4.61	5.03	5.44	5.74	6.02	6.36	6.69	7.05	7.41	7.74	8.24	8.63	8.69	8.85	8.36
3	0.24	0.54	0.87	1.19	1.49	1.78	2.07	2.33	2.58	2.80	3.02	3.21	3.65	4.04	4.44	4.81	5.25	5.68	6.00	6.28	6.64	6.98	7.37	7.74	8.08	8.61	9.01	9.08	9.24	8.74
3 1/4	0.25	0.57	0.90	1.24	1.55	1.86	2.15	2.43	2.68	2.92	3.14	3.34	3.79	4.21	4.62	5.01	5.47	5.92	6.24	6.54	6.92	7.27	7.67	8.05	8.41	8.96	9.38	9.45	9.62	9.09
3 1/2	0.26	0.59	0.94	1.29	1.61	1.93	2.23	2.52	2.78	3.03	3.26	3.47	3.94	4.37	4.80	5.20	5.67	6.14	6.48	6.79	7.18	7.54	7.96	8.36	8.73	9.30	9.74	9.80	9.98	9.43
3 3/4	0.26	0.61	0.97	1.33	1.67	2.00	2.31	2.61	2.88	3.13	3.37	3.59	4.08	4.52	4.96	5.38	5.87	6.36	6.71	7.03	7.43	7.81	8.24	8.65	9.04	9.62	10.08	10.15	10.33	9.77
4	0.27	0.63	1.00	1.38	1.72	2.06	2.38	2.69	2.97	3.24	3.48	3.71	4.21	4.67	5.13	5.55	6.07	6.56	6.93	7.26	7.67	8.06	8.51	8.93	9.33	9.94	10.41	10.48	10.67	10.09
4 1/4	0.28	0.65	1.03	1.42	1.78	2.12	2.46	2.78	3.07	3.34	3.59	3.82	4.34	4.81	5.29	5.72	6.25	6.77	7.14	7.48	7.91	8.31	8.77	9.21	9.62	10.25	10.73	10.80	11.00	10.40
4 1/2	0.29	0.67	1.06	1.46	1.83	2.19	2.53	2.86	3.16	3.43	3.69	3.93	4.46	4.95	5.44	5.89	6.43	6.96	7.35	7.70	8.14	8.55	9.02	9.47	9.90	10.54	11.04	11.12	11.32	10.70
4 3/4	0.30	0.69	1.09	1.50	1.88	2.25	2.60	2.94	3.24	3.53	3.79	4.04	4.59	5.09	5.59	6.05	6.61	7.15	7.55	7.91	8.36	8.79	9.27	9.73	10.17	10.83	11.34	11.42	11.63	10.99
5	0.31	0.70	1.12	1.54	1.93	2.30	2.67	3.01	3.33	3.62	3.89	4.15	4.71	5.22	5.73	6.21	6.78	7.34	7.75	8.11	8.58	9.02	9.51	9.99	10.44	11.11	11.64	11.72	11.93	11.28
5 1/2	0.32	0.74	1.17	1.61	2.02	2.42	2.80	3.16	3.49	3.80	4.08	4.35	4.94	5.47	6.01	6.51	7.11	7.70	8.12	8.51	9.00	9.46	9.98	10.47	10.94	11.66	12.20	12.29	12.52	11.83
6	0.33	0.77	1.22	1.69	2.11	2.52	2.92	3.30	3.64	3.96	4.26	4.54	5.16	5.72	6.28	6.80	7.43	8.04	8.48	8.89	9.40	9.88	10.42	10.94	11.43	12.17	12.75	12.84	13.07	12.35
6 1/2	0.35	0.80	1.27	1.75	2.20	2.63	3.04	3.44	3.79	4.13	4.44	4.73	5.37	5.95	6.54	7.08	7.73	8.37	8.83	9.25	9.78	10.28	10.85	11.39	11.90	12.67	13.27	13.36	13.61	12.86
7	0.36	0.83	1.32	1.82	2.28	2.73	3.15	3.56	3.94	4.28	4.61	4.91	5.57	6.17	6.78	7.35	8.03	8.68	9.16	9.60	10.15	10.67	11.26	11.82	12.35	13.15	13.77	13.87	14.12	13.34
7 1/2	0.37	0.86	1.37	1.88	2.36	2.82	3.27	3.69	4.07	4.43	4.77	5.08	5.76	6.39	7.02	7.61	8.31	8.99	9.49	9.94	10.51	11.04	11.65	12.23	12.78	13.61	14.25	14.35	14.62	13.81
8	0.39	0.89	1.41	1.95	2.44	2.91	3.37	3.81	4.21	4.58	4.92	5.24	5.95	6.60	7.25	7.85	8.58	9.28	9.80	10.26	10.85	11.41	12.03	12.63	13.20	14.06	14.72	14.82	15.10	14.26
8 1/2	0.40	0.92	1.46	2.01	2.51	3.00	3.48	3.93	4.34	4.72	5.08	5.41	6.14	6.80	7.47	8.10	8.84	9.57	10.10	10.58	11.18	11.76	12.40	13.02	13.61	14.49	15.17	15.28	15.56	14.70
9	0.41	0.94	1.50	2.06	2.59	3.09	3.58	4.04	4.46	4.86	5.22	5.56	6.31	7.00	7.69	8.33	9.10	9.85	10.39	10.89	11.51	12.10	12.76	13.40	14.00	14.91	15.61	15.72	16.01	15.13
9 1/2	0.42	0.97	1.54	2.12	2.66	3.18	3.67	4.15	4.58	4.99	5.37	5.71	6.49	7.19	7.90	8.56	9.35	10.12	10.68	11.18	11.82	12.43	13.11	13.77	14.38	15.32	16.04	16.15	16.45	15.54
10	0.43	0.99	1.58	2.18	2.73	3.26	3.77	4.26	4.70	5.12	5.50	5.86	6.66	7.38	8.11	8.78	9.59	10.38	10.95	11.47	12.13	12.75	13.45	14.12	14.76	15.72	16.46	16.57	16.88	15.95
11	0.45	1.04	1.66	2.28	2.86	3.42	3.95	4.47	4.93	5.37	5.77	6.15	6.98	7.74	8.50	9.21	10.06	10.88	11.49	12.03	12.72	13.37	14.11	14.81	15.48	16.48	17.26	17.38	17.70	16.73
12	0.47	1.09	1.73	2.38	2.99	3.57	4.13	4.67	5.15	5.61	6.03	6.42	7.29	8.08	8.88	9.62	10.51	11.37	12.00	12.57	13.29	13.97	14.74	15.47	16.17	17.22	18.03	18.15	18.49	17.47
13	0.49	1.13	1.80	2.48	3.11	3.72	4.30	4.86	5.36	5.84	6.28	6.69	7.59	8.41	9.24	10.01	10.94	11.83	12.49	13.08	13.83	14.54	15.34	16.10	16.83	17.92	18.76	18.90	19.24	18.18
14	0.51	1.18	1.87	2.57	3.23	3.86	4.46	5.04	5.57	6.06	6.51	6.94	7.87	8.73	9.59	10.39	11.35	12.28	12.96	13.58	14.35	15.09	15.92	16.71	17.46	18.60	19.47	19.61	19.97	18.87
15	0.53	1.22	1.94	2.66	3.34	3.99	4.62	5.22	5.76	6.27	6.74	7.18	8.15	9.04	9.93	10.76	11.75	12.71	13.41	14.05	14.86	15.62	16.48	17.30	18.07	19.25	20.15	20.30	20.67	19.53
16	0.55	1.26	2.00	2.75	3.45	4.12	4.77	5.39	5.95	6.47	6.96	7.42	8.42	9.33	10.26	11.11	12.13	13.13	13.85	14.51	15.34	16.13	17.02	17.87	18.67	19.88	20.81	20.96	21.35	20.17
17	0.56	1.30	2.06	2.84	3.56	4.25	4.92	5.56	6.13	6.67	7.18	7.64	8.68	9.62	10.57	11.45	12.51	13.53	14.28	14.96	15.82	16.63	17.54	18.42	19.24	20.49	21.46	21.61	22.00	20.79
18	0.58	1.33	2.12	2.92	3.66	4.37	5.06	5.72	6.31	6.87	7.39	7.87	8.93	9.90	10.88	11.78	12.87	13.92	14.70	15.40	16.28	17.11	18.05	18.95	19.80	21.09	22.08	22.24	22.64	21.40
19	0.59	1.37	2.18	3.00	3.76	4.49	5.20	5.87	6.48	7.06	7.59	8.08	9.17	10.17	11.18	12.10	13.22	14.31	15.10	15.82	16.72	17.58	18.54	19.47	20.34	21.66	22.68	22.84	23.26	21.98
20	0.61	1.41	2.24	3.08	3.86	4.61	5.33	6.03	6.65	7.24	7.79	8.29	9.41	10.44	11.47	12.42	13.56	14.68	15.49	16.23	17.16	18.03	19.03	19.97	20.87	22.23	23.27	23.44	23.87	22.55
21	0.63	1.44	2.29	3.15	3.95	4.72	5.46	6.17	6.82	7.42	7.98	8.50	9.64	10.69	11.75	12.73	13.90	15.04	15.87	16.63	17.58	18.48	19.50	20.47	21.39	22.77	23.85	24.02	24.46	23.11
22	0.64	1.48	2.35	3.23	4.04	4.83	5.59	6.32	6.98	7.59	8.17	8.70	9.87	10.95	12.03	13.03	14.23	15.39	16.25	17.02	17.99	18.91	19.95	20.95	21.89	23.31	24.41	24.58	25.03	23.65
23	0.65	1.51	2.40	3.30	4.14	4.94	5.72	6.46	7.13	7.76	8.35	8.89	10.09	11.19	12.30	13.32	14.55	15.74	16.61	17.40	18.40	19.34	20.40	21.42	22.38	23.83	24.96	25.13	25.60	24.19
24	0.67	1.54	2.45	3.37	4.22	5.05	5.84	6.60	7.29	7.93	8.53	9.08	10.31	11.43	12.56	13.60	14.86	16.08	16.97	17.78	18.79	19.75	20.84	21.88	22.86	24.35	25.49	25.67	26.15	24.71
25	0.68	1.57	2.50	3.44	4.31	5.15	5.96	6.74	7.44	8.09	8.70	9.27	10.52	11.67	12.82	13.88	15.17	16.41	17.32	18.14	19.18	20.16	21.27	22.33	23.33	24.85	26.02	26.20	26.68	25.22
26	0.70	1.60	2.55	3.51	4.40	5.25	6.08	6.87	7.58	8.25	8.88	9.45	10.73	11.90	13.07	14.16	15.47	16.73	17.66	18.50	19.56	20.56	21.69	22.77	23.80	25.34	26.53	26.72	27.21	25.72
27	0.71	1.63	2.60	3.58	4.48	5.35	6.20	7.00	7.73	8.41	9.05	9.63	10.94	12.13	13.32	14.43	15.76	17.05	18.00	18.85	19.93	20.95	22.11	23.21	24.25	25.82	27.04	27.23	27.73	26.21
28	0.72	1.66	2.65	3.64	4.56	5.45	6.31	7.13	7.87	8.56	9.21	9.81	11.14	12.35	13.57	14.69	16.05	17.37	18.33	19.20	20.30	21.34	22.51	23.63	24.69	26.30	27.54	27.73	28.24	26.69
29	0.73	1.69	2.69	3.71	4.64	5.55	6.42	7.26	8.01	8.72	9.37	9.98	11.33	12.57	13.81	14.95	16.33	17.67	18.65	19.54	20.66	21.71	22.91	24.05	25.13	26.76	28.02	28.22	28.74	27.16
30	0.75	1.72	2.74	3.77	4.72	5.64	6.53	7.38	8.15	8.87	9.53	10.16	11.53	12.78	14.04	15.21	16.61	17.98	18.97	19.87	21.01	22.09	23.30	24.46	25.56	27.22	28.50	28.71	29.23	27.62
31	0.76	1.75	2.78	3.83	4.80	5.74	6.64	7.50	8.28	9.01	9.69	10.32	11.72	12.99	14.28	15.46	16.89	18.27	19.29	20.20	21.36	22.45	23.69	24.87	25.98	27.67	28.97	29.18	29.71	28.08
32	0.77	1.78	2.83	3.89	4.88	5.83	6.74	7.62	8.41	9.16	9.85	10.49	11.91	13.20	14.50	15.71	17.16	18.56	19.59	20.53	21.70	22.81	24.07	25.27	26.40	28.11	29.44	29.65	30.19	28.53
33	0.78	1.81	2.87	3.95	4.95	5.92	6.85	7.74	8.54	9.30	10.00	10.65	12.09	13.41	14.73	15.95	17.42	18.85	19.90	20.84	22.04	23.16	24.44	25.66	26.81	28.55	29.89	30.11	30.66	28.97
34	0.80	1.83	2.92	4.01	5.03	6.01	6.95	7.86	8.67	9.44	10.15	10.81	12.27	13.61	14.95	16.19	17.69	19.14	20.20	21.16	22.37	23.51	24.81	26.04	27.21	28.98	30.34	30.56	31.12	29.41

30" DIA. - Waterman C-10 - Type GATE

30" DIA. - Waterman C-10 - Type GATE

Head	Net Gate Opening (inches)																					
(Inches)	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10	11	12	13	14	15	16	18
1	0.15	0.36	0.58	0.84	1.05	1.25	1.45	1.63	1.84	2.00	2.20	2.34	2.69	3.03	3.35	3.64	3.92	4.20	4.48	4.75	5.03	5.28	5.84
1 1/4	0.16	0.40	0.65	0.93	1.17	1.39	1.62	1.82	2.04	2.23	2.45	2.61	2.99	3.36	3.71	4.04	4.36	4.67	4.99	5.30	5.61	5.89	6.49
1 1/2	0.18	0.43	0.70	1.01	1.27	1.52	1.76	1.97	2.22	2.43	2.66	2.85	3.25	3.63	4.05	4.41	4.75	5.11	5.46	5.80	6.12	6.46	7.08
1 3/4	0.19	0.47	0.76	1.08	1.37	1.63	1.89	2.12	2.39	2.62	2.87	3.06	3.50	3.88	4.37	4.73	5.11	5.49	5.86	6.22	6.57	6.94	7.60
2	0.20	0.50	0.81	1.16	1.46	1.74	2.02	2.27	2.54	2.80	3.05	3.27	3.73	4.13	4.64	5.03	5.45	5.86	6.26	6.63	7.02	7.41	8.11
2 1/4	0.22	0.53	0.86	1.23	1.55	1.85	2.14	2.40	2.69	2.96	3.22	3.46	3.95	4.38	4.90	5.33	5.78	6.21	6.64	7.04	7.45	7.86	8.61
2 1/2	0.23	0.56	0.90	1.30	1.63	1.94	2.25	2.52	2.84	3.11	3.38	3.63	4.15	4.63	5.15	5.61	6.09	6.55	7.00	7.41	7.85	8.29	9.07
2 3/4	0.24	0.58	0.94	1.36	1.70	2.03	2.35	2.64	2.98	3.25	3.53	3.80	4.34	4.86	5.40	5.89	6.39	6.87	7.34	7.78	8.23	8.69	9.51
3	0.25	0.61	0.98	1.41	1.77	2.11	2.45	2.75	3.11	3.38	3.67	3.95	4.53	5.08	5.64	6.16	6.68	7.17	7.67	8.13	8.60	9.08	9.94
3 1/4	0.26	0.63	1.02	1.46	1.84	2.19	2.55	2.86	3.22	3.50	3.81	4.10	4.71	5.29	5.87	6.41	6.95	7.46	7.98	8.46	8.95	9.45	10.34
3 1/2	0.27	0.65	1.05	1.51	1.90	2.27	2.64	2.96	3.33	3.62	3.94	4.25	4.88	5.49	6.09	6.65	7.21	7.75	8.28	8.78	9.29	9.81	10.74
3 3/4	0.28	0.67	1.09	1.56	1.96	2.35	2.72	3.06	3.43	3.74	4.07	4.40	5.05	5.68	6.30	6.88	7.47	8.02	8.57	9.09	9.62	10.14	11.12
4	0.28	0.69	1.12	1.61	2.02	2.42	2.80	3.15	3.53	3.85	4.20	4.54	5.21	5.86	6.51	7.10	7.71	8.28	8.85	9.38	9.93	10.47	11.48
4 1/4	0.29	0.71	1.15	1.65	2.08	2.49	2.88	3.24	3.63	3.96	4.33	4.68	5.38	6.04	6.71	7.32	7.95	8.54	9.12	9.67	10.23	10.80	11.83
4 1/2	0.30	0.73	1.18	1.69	2.14	2.56	2.96	3.33	3.73	4.07	4.45	4.82	5.54	6.22	6.91	7.54	8.18	8.79	9.39	9.95	10.53	11.12	12.17
4 3/4	0.31	0.75	1.21	1.73	2.20	2.62	3.04	3.42	3.82	4.18	4.57	4.95	5.69	6.39	7.10	7.75	8.40	9.03	9.65	13.23	10.82	11.43	12.51
5	0.31	0.77	1.24	1.77	2.25	2.68	3.11	3.50	3.91	4.29	4.69	5.08	5.84	6.56	7.29	7.95	8.62	9.26	9.90	10.50	11.11	11.73	12.84
5 1/2	0.33	0.80	1.30	1.85	2.35	2.80	3.25	3.66	4.09	4.50	4.92	5.33	6.12	6.88	7.64	8.34	9.05	9.72	10.38	11.02	11.65	12.30	13.47
6	0.34	0.83	1.35	1.93	2.45	2.92	3.39	3.82	4.27	4.70	5.14	5.56	6.39	7.19	7.98	8.70	9.45	10.14	10.84	11.50	12.16	12.83	14.06
6 1/2	0.36	0.87	1.41	2.01	2.55	3.04	3.53	3.97	4.44	4.89	5.35	5.79	6.65	7.48	8.31	9.06	9.84	10.56	11.29	11.96	12.66	13.36	14.63
7	0.37	0.90	1.46	2.09	2.64	3.15	3.64	4.13	4.61	5.07	5.55	6.01	6.90	7.76	8.62	9.40	10.20	10.96	11.72	12.42	13.14	13.87	15.19
7 1/2	0.38	0.93	1.51	2.16	2.72	3.25	3.76	4.27	4.77	5.25	5.75	6.21	7.15	8.03	8.92	9.74	10.56	11.35	12.13	12.85	13.60	14.36	15.72
8	0.39	0.96	1.55	2.23	2.80	3.34	3.88	4.41	4.92	5.42	5.94	6.42	7.38	8.30	9.21	10.06	10.90	11.72	12.52	13.27	14.04	14.83	16.23
8 1/2	0.40	0.99	1.60	2.30	2.88	3.43	3.99	4.54	5.07	5.59	6.12	6.61	7.60	8.55	9.49	10.36	11.23	12.08	12.91	13.68	14.47	15.29	16.73
9	0.42	1.01	1.64	2.36	2.96	3.52	4.10	4.67	5.22	5.75	6.30	6.81	7.82	8.80	9.76	10.66	11.56	12.44	13.28	14.07	14.90	15.74	17.21
9 1/2	0.43	1.04	1.68	2.42	3.04	3.61	4.21	4.80	5.36	5.91	6.47	7.00	8.04	9.04	10.03	10.95	11.89	19.79	13.64	14.46	15.30	16.15	17.68
10	0.44	1.06	1.73	2.48	3.12	3.70	4.32	4.93	5.50	6.06	6.64	7.18	8.26	9.28	10.30	11.24	12.20	13.12	14.00	14.85	15.70	16.60	18.15
11	0.46	1.11	1.81	2.59	3.27	3.88	4.53	5.17	5.78	6.36	6.96	7.53	8.66	9.73	10.80	11.78	12.79	13.74	14.69	15.57	16.47	17.40	19.03
12	0.48	1.16	1.88	2.70	3.40	4.05	4.74	5.40	6.04	6.64	7.27	7.86	9.04	10.16	11.28	12.31	13.36	14.35	15.33	16.26	17.20	18.16	19.88
13	0.49	1.21	1.96	2.81	3.52	4.21	4.93	5.62	6.28	6.91	7.57	8.19	9.40	10.57	11.74	12.82	13.90	14.94	15.96	16.93	17.90	18.90	20.70
14	0.51	1.25	2.03	2.91	3.64	4.37	5.11	5.84	6.51	7.17	7.86	8.49	9.76	10.97	12.18	13.30	14.43	15.50	15.56	17.56	18.57	19.60	21.48
15	0.53	1.29	2.09	3.01	3.76	4.52	5.29	6.04	6.74	7.42	8.13	8.79	10.10	11.37	12.62	13.76	14.93	16.04	17.14	18.18	19.23	20.30	22.23
16	0.55	1.33	2.16	3.11	3.88	4.67	5.47	6.24	6.96	7.66	8.40	9.08	10.43	11.74	13.03	14.22	15.42	16.57	17.70	18.77	19.86	20.97	22.95
17	0.56	1.37	2.23	3.20	3.99	4.81	5.64	6.43	7.18	7.90	8.66	9.36	10.76	12.10	13.43	14.65	15.90	17.08	18.26	19.36	20.48	21.62	23.66
18	0.58	1.41	2.29	3.28	4.10	4.95	5.79	6.61	7.39	8.13	8.91	9.63	11.06	12.43	13.81	15.08	16.36	17.57	18.78	19.90	21.05	22.25	24.34
19				3.90	4.60	5.30	6.20	7.00	7.80	8.60	9.40	10.20	11.60	12.50	13.90	15.20	16.40	17.60	18.90	19.95	21.20	22.30	24.60
20				4.00	4.70	5.50	6.40	7.20	8.00	8.80	9.60	10.50	11.90	12.70	14.10	15.50	16.60	17.70	19.10	20.00	21.40	22.50	25.20
21				4.10	4.90	5.60	6.50	7.40	8.20	9.00	9.90	10.70	12.20	13.00	14.40	15.90	17.00	17.90	19.50	20.50	22.00	23.10	25.80
22				4.20	5.00	5.70	6.70	7.60	8.30	9.20	10.10	11.00	12.50	13.30	14.80	16.20	17.40	18.30	20.00	21.00	22.50	23.60	26.50
23				4.30	5.10	5.90	6.80	7.70	8.50	9.40	10.30	11.20	12.80	13.60	15.10	16.60	17.80	18.80	20.40	21.50	23.00	24.20	27.00
24				4.40	5.20	6.00	7.00	7.90	8.70	9.70	10.50	11.50	13.00	13.90	15.40	17.00	18.20	19.20	20.90	21.90	23.50	24.70	27.60
25				4.50	5.30	6.10	7.10	8.10	8.90	9.90	10.80	11.70	13.30	14.20	15.80	17.30	18.60	19.60	21.30	22.40	24.00	25.20	28.20
26				4.60	5.40	6.20	7.20	8.20	9.10	10.00	11.00	11.90	13.60	14.50	16.10	17.60	18.90	19.90	21.70	22.80	24.40	25.70	28.80
27				4.70	5.50	6.30	7.40	8.40	9.20	10.20	11.20	12.20	13.80	14.80	16.40	18.00	19.30	20.30	22.10	23.30	24.90	26.20	29.30
28				4.75	5.60	6.50	7.50	8.50	9.40	10.40	11.40	12.40	14.10	15.00	16.70	18.30	19.60	20.70	22.50	23.70	25.30	26.70	29.80
29				4.80	5.70	6.60	7.60	8.70	9.60	10.60	11.60	12.60	14.30	15.30	17.00	18.60	20.00	21.10	22.90	24.10	25.80	27.10	30.40
30				4.90	5.80	6.70	7.80	8.80	9.70	10.80	11.80	12.80	14.60	15.60	17.30	19.00	20.30	21.40	23.30	24.50	26.20	27.60	30.90
31				5.00	5.90	6.80	7.90	9.00	9.90	11.00	12.00	13.00	14.80	15.80	17.50	19.30	20.70	21.80	23.70	24.90	26.70	28.10	31.40
32				5.10	6.00	6.90	8.00	9.10	10.10	11.10	12.20	13.20	15.00	16.10	17.80	19.60	21.00	22.10	24.10	25.30	27.10	28.50	31.90
33				5.15	6.10	7.00	8.20	9.20	10.20	11.30	12.40	13.40	15.30	16.30	18.10	19.90	21.30	22.50	24.50	25.70	27.50	29.00	32.40
34				5.20	6.20	7.10	8.30	9.40	10.40	11.50	12.50	13.60	15.50	16.60	18.40	20.20	21.60	22.80	24.80	26.10	27.90	29.40	32.90

S:\Water Operations\2016 Water Operations\ITRC Gate Calculations\Copy of ITRC Waterman C-10 Meter Gate Rating Tables.xlsxWaterman C-10 30"

Head (Inches)	20	22	24	26	28	30
1	6.34	6.76	7.10	7.46	7.70	7.86
1 1/4	7.04	7.51	7.90	8.31	8.58	8.77
1 1/2	7.67	8.19	8.65	9.07	9.40	9.59
1 3/4	8.25	8.81	9.29	9.72	10.15	10.32
2	8.78	9.40	9.91	10.34	10.88	11.04
2 1/4	9.31	9.94	10.48	10.94	11.56	11.74
2 1/2	9.81	10.48	11.03	11.52	12.16	12.40
2 3/4	10.28	19.98	11.56	12.08	12.68	13.00
3	10.75	11.47	12.07	12.62	13.18	13.55
3 1/4	11.20	11.95	12.57	13.15	13.68	14.05
3 1/2	11.62	12.40	13.06	13.65	14.18	14.52
3 3/4	12.03	12.83	13.50	14.12	14.67	14.98
4	12.42	13.25	13.94	15.58	15.15	15.44
4 1/4	12.80	13.66	14.37	15.03	15.61	15.90
4 1/2	13.17	14.06	14.80	15.47	16.07	16.36
4 3/4	13.54	14.45	15.20	15.90	16.52	16.82
5	13.90	14.83	15.60	16.32	16.95	17.26
5 1/2	14.57	15.56	16.36	17.10	17.77	18.10
6	15.20	16.23	17.08	17.85	18.55	18.90
6 1/2	15.83	16.90	17.77	18.58	19.30	19.65
7	16.43	17.53	18.45	19.30	20.04	20.40
7 1/2	17.00	18.15	19.10	19.97	20.74	21.12
8	17.56	18.73	19.72	20.62	21.42	21.82
8 1/2	18.10	19.30	20.32	21.26	22.08	22.52
9	18.62	19.87	20.91	21.87	22.72	23.17
9 1/2	19.14	20.41	21.49	22.47	23.34	23.80
10	19.65	20.95	22.06	23.06	23.95	24.40
11	20.50	21.96	23.13	24.20	25.12	25.58
12	21.50	22.95	24.15	25.25	26.23	26.72
13	22.40	23.90	25.15	26.28	27.30	27.80
14	23.23	24.80	26.10	27.28	28.32	28.85
15	24.05	25.66	27.00	28.23	29.32	29.86
16	24.84	26.50	27.87	29.15	30.30	30.84
17	25.60	27.32	28.73	30.06	31.25	31.80
18	26.34	28.10	29.56	30.92	32.15	32.70
19	27.00	28.90	30.10	31.50	32.70	33.30
20	27.70	29.70	30.90	32.30	33.50	34.20
21	28.40	30.40	31.70	33.10	34.40	35.10
22	29.10	31.10	32.40	33.90	35.20	35.90
23	29.70	31.80	33.10	34.60	36.00	36.70
24	30.40	32.50	33.90	35.40	36.70	37.50
25	31.00	33.20	34.60	36.10	37.50	38.30
26	31.60	33.90	35.20	36.80	38.20	39.00
27	32.20	34.50	35.90	37.50	39.00	39.80
28	32.80	35.10	36.60	38.20	39.70	40.50
29	33.40	35.80	37.20	38.90	40.40	41.20
30	34.00	36.40	37.80	39.50	41.10	41.90
31	34.50	37.00	38.50	40.20	41.80	42.60
32	35.10	37.60	39.10	40.80	42.40	43.30
33	35.60	38.10	39.70	41.50	43.10	43.90
34	36.20	38.70	40.30	42.10	43.70	44.60

36" DIA. - Waterman C-10 - Type GATE

36" DIA. - Waterman C-10 - Type GATE

Head (inches)	Net Gate Opening (inches) 1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34	36
1	0.17	0.42	0.68	0.96	1.22	1.47	1.71	1.94	2.16	2.41	2.61	2.82	3.24	3.67	4.05	4.42	4.77	5.10	5.47	5.83	6.13	6.50	7.12	7.86	8.43	8.92	9.37	9.84	10.10	10.35	10.56	10.74
1 1/4	0.19	0.46	0.75	1.07	1.35	1.62	1.89	2.15	2.41	2.69	2.90	3.12	3.59	4.05	4.50	4.91	5.31	5.67	6.10	6.49	6.82	7.22	7.87	8.67	9.30	9.88	10.38	10.89	11.20	11.50	11.74	11.92
1 1/2	0.21	0.50	0.82	1.17	1.47	1.77	2.06	2.34	2.63	2.94	3.16	3.40	3.92	4.43	4.93	5.36	5.79	6.20	6.68	7.08	7.44	7.89	8.59	9.44	10.14	10.81	11.33	11.86	12.24	12.57	12.84	13.02
1 3/4	0.22	0.54	0.88	1.26	1.59	1.92	2.22	2.53	2.84	3.18	3.42	3.67	4.24	4.77	5.32	4.79	6.25	6.70	7.20	7.63	8.04	8.52	9.28	10.17	10.95	11.65	12.25	12.80	13.24	13.60	13.91	14.09
2	0.24	0.58	0.94	1.34	1.70	2.05	2.36	2.69	3.04	3.39	3.66	3.92	4.53	5.08	5.68	6.18	6.66	7.17	7.67	8.13	8.60	9.10	9.95	10.87	11.71	12.43	13.09	13.67	14.16	14.54	14.87	15.05
2 1/4	0.25	0.61	1.00	1.42	1.80	2.17	2.50	2.85	3.21	3.58	3.87	4.14	4.79	5.38	6.00	6.52	7.04	7.61	8.12	8.62	9.12	9.65	10.57	11.52	12.42	13.18	13.86	14.47	15.00	15.39	15.74	15.95
2 1/2	0.27	0.65	1.05	1.50	1.89	2.28	2.63	3.00	3.37	3.76	4.07	4.35	5.04	5.65	6.30	6.85	7.42	8.02	8.56	9.09	9.61	10.18	11.13	12.16	13.10	13.88	14.60	15.21	15.76	16.17	16.54	16.78
2 3/4	0.28	0.68	1.10	1.57	1.98	2.39	2.76	3.14	3.52	3.93	4.26	4.55	5.28	5.91	6.60	7.18	7.79	8.42	8.98	9.54	10.07	10.68	11.68	12.76	13.73	14.55	15.31	15.93	16.50	16.94	17.34	17.60
3	0.29	0.70	1.15	1.63	2.06	2.49	2.88	3.28	3.67	4.10	4.45	4.75	5.50	6.17	6.89	7.50	8.13	8.79	9.37	9.95	10.52	11.15	12.20	13.31	14.35	15.20	16.00	16.64	17.23	17.68	18.10	18.38
3 1/4	0.30	0.73	1.19	1.69	2.14	2.59	3.00	3.41	3.82	4.27	4.63	1.95	5.72	6.42	7.17	7.81	8.46	9.15	9.76	10.35	10.96	11.60	12.70	13.86	14.95	15.83	16.66	17.33	17.94	18.40	18.85	19.14
3 1/2	0.31	0.76	1.23	1.75	2.21	2.68	3.11	3.53	3.95	4.42	4.79	5.13	5.93	6.66	7.44	8.10	8.78	9.49	10.12	10.74	11.37	12.04	13.18	14.37	15.50	16.42	17.28	17.98	18.61	19.08	19.54	19.85
3 3/4	0.32	0.78	1.27	1.81	2.28	2.76	3.22	3.65	4.08	4.56	4.95	5.31	6.14	6.90	7.70	8.39	9.09	9.82	10.48	11.11	11.77	12.46	13.63	14.89	16.04	16.99	17.89	18.60	19.27	19.74	20.23	20.55
4	0.33	0.80	1.31	1.86	2.35	2.84	3.31	3.76	4.20	4.68	5.11	5.49	6.34	7.13	7.95	8.66	9.38	10.14	10.83	11.48	12.15	12.87	14.08	15.37	16.96	17.55	18.46	19.20	19.90	20.40	20.89	21.25
4 1/4	0.29	0.71	1.16	1.91	1.42	2.92	3.40	3.86	4.32	4.81	5.27	5.66	6.54	7.35	8.20	8.93	9.67	10.45	11.16	11.83	12.52	13.27	14.51	15.84	17.08	18.10	19.03	19.80	20.50	21.05	21.53	21.90
4 1/2	0.35	0.85	1.38	1.96	2.49	3.00	3.49	3.96	4.44	4.94	5.42	5.82	6.73	7.56	8.44	9.19	9.95	10.76	11.49	12.18	12.89	13.66	14.94	16.31	17.57	18.61	19.60	20.38	21.10	21.65	22.17	22.55
4 3/4	0.36	0.87	1.42	2.01	2.56	3.08	3.58	4.06	4.56	5.07	5.57	5.98	6.92	7.77	8.67	9.45	10.22	11.06	11.80	12.52	13.25	14.04	15.35	16.76	18.05	19.13	20.15	20.95	21.68	22.25	22.80	23.20
5	0.37	0.89	1.45	2.06	2.62	3.16	3.67	4.16	4.68	5.19	5.72	6.14	7.10	7.97	8.89	9.70	10.49	11.34	12.10	12.85	13.60	14.40	15.75	17.20	18.53	19.64	20.65	21.50	22.25	22.80	23.40	23.80
5 1/2	0.39	0.93	1.52	2.16	2.74	3.31	3.84	4.36	4.90	5.43	6.00	6.43	7.44	8.36	9.33	10.17	11.00	11.90	12.70	13.47	14.25	15.10	16.52	18.03	19.43	20.60	21.65	22.55	23.35	23.90	24.50	24.90
6	0.40	0.97	1.59	2.26	2.86	3.45	4.00	4.55	5.11	5.67	6.26	4.71	7.77	8.73	9.73	10.61	11.50	12.42	13.26	14.07	14.88	15.77	17.25	18.82	20.28	21.50	22.62	23.55	24.39	24.95	25.60	26.00
6 1/2	0.42	1.01	1.65	2.35	2.98	3.59	4.16	4.72	5.32	5.91	6.52	6.99	8.09	9.09	10.13	11.04	11.97	12.93	13.80	14.64	15.50	16.41	17.97	19.60	21.13	22.40	23.65	24.50	26.39	26.00	26.65	27.10
7	0.44	1.05	1.71	2.44	3.09	3.72	4.31	4.89	5.52	6.14	6.76	7.25	8.39	9.43	10.51	11.46	12.41	13.42	14.32	15.20	16.09	17.03	18.64	20.35	21.94	23.25	24.44	25.43	26.33	27.00	27.67	28.15
7 1/2	0.45	1.09	1.77	2.53	3.19	3.85	4.45	5.06	5.72	6.36	7.00	7.51	8.69	9.76	10.89	11.87	12.85	13.90	14.83	15.74	16.67	17.64	19.30	21.08	22.72	24.08	25.30	26.34	27.25	27.95	28.65	19.15
8	0.46	1.12	1.83	2.61	3.29	3.97	4.59	5.23	5.91	6.57	7.23	7.76	8.97	10.09	11.24	12.26	13.28	14.35	15.32	16.25	17.20	18.21	19.92	21.75	23.45	24.84	26.13	27.20	28.13	28.85	29.55	30.10
8 1/2	0.48	1.16	1.88	2.69	3.38	4.08	4.72	5.39	6.09	6.77	7.45	8.00	9.25	10.40	11.59	12.63	13.68	14.79	15.79	16.74	17.72	18.77	20.54	22.42	24.15	25.60	26.95	28.05	29.00	29.75	3.0.45	31.00
9	0.49	1.19	1.93	2.76	3.47	4.19	4.85	5.55	6.27	6.97	7.60	8.23	9.52	10.70	11.93	13.00	14.08	15.21	16.25	17.23	18.23	19.31	21.15	23.07	24.85	26.33	27.73	28.85	29.84	30.62	31.35	31.88
9 1/2	0.50	1.22	1.98	2.83	3.56	4.30	4.98	5.70	6.44	7.16	7.87	8.45	9.78	11.00	12.26	13.37	14.47	15.63	16.68	17.70	18.73	19.84	21.72	23.70	15.55	27.05	28.47	29.63	30.65	31.45	32.20	32.75
10	0.52	1.25	2.03	2.90	3.65	4.41	5.11	5.85	6.61	7.35	8.07	8.67	10.03	11.28	12.58	13.71	14.83	16.03	17.10	18.17	19.21	20.35	22.27	24.30	26.20	27.75	29.20	30.40	31.45	32.25	33.05	33.60
11	0.54	1.31	2.13	3.05	3.82	4.60	5.36	6.13	6.92	7.70	8.46	9.10	10.52	11.82	13.18	14.37	15.55	16.81	17.93	19.05	20.14	21.33	23.35	25.47	27.45	29.10	30.60	31.85	32.95	33.80	34.65	35.20
12	0.56	1.36	2.21	3.16	3.98	4.79	5.61	6.40	7.23	8.05	8.85	9.51	10.99	12.35	13.78	15.01	16.25	17.58	18.74	19.90	21.05	22.30	24.40	26.62	18.70	30.40	32.00	33.30	34.45	35.35	36.20	36.80
13	0.58	1.41	2.30	3.28	4.14	4.98	5.85	6.67	7.52	8.39	9.22	9.89	11.44	12.85	14.35	15.62	16.93	18.30	19.53	20.72	21.92	23.22	25.40	27.75	29.87	31.65	33.32	34.65	35.85	36.80	37.68	38.30
14	0.60	1.46	2.38	3.39	4.29	5.16	6.06	6.91	7.81	8.70	9.56	10.26	11.88	13.33	14.88	16.21	17.58	18.99	20.25	21.50	22.75	24.10	26.35	28.80	31.00	32.85	34.60	35.98	37.20	38.18	39.10	39.75
15	0.62	1.51	2.46	3.50	4.43	5.34	6.27	7.15	8.08	9.00	9.89	10.62	12.30	13.80	15.40	16.78	18.19	19.64	20.95	22.24	23.54	24.93	27.30	29.80	32.10	34.00	35.80	37.25	28.50	39.50	40.45	41.15
16	0.64	1.56	2.54	3.61	4.56	5.51	6.48	7.39	8.34	9.29	10.22	10.98	12.69	14.27	15.90	17.33	18.78	20.29	54.65	22.98	24.30	25.75	28.20	30.75	33.15	35.10	36.95	38.45	29.80	40.80	41.80	42.50
17	0.66	1.60	2.61	3.72	4.69	5.68	6.68	7.62	8.60	9.58	10.54	11.32	13.08	14.70	16.39	17.86	19.34	20.92	22.32	23.69	25.05	26.55	29.03	31.70	34.15	36.20	38.10	39.60	41.10	42.05	43.10	43.80
18	0.68	1.65	2.68	3.82	4.82	5.85	6.87	7.84	8.85	9.86	10.84	11.64	13.45	15.12	16.88	18.39	19.89	21.54	22.97	24.36	25.78	27.33	29.85	32.63	35.15	37.25	39.20	40.75	42.30	43.25	44.35	45.10
19				3.90	4.95	6.00	7.05	8.10	9.20	10.30	11.15	12.00	13.80	15.50	17.30	18.80	20.00	22.00	24.00	25.00	27.00	28.00	31.00	34.00	36.00	38.00	41.00	42.00	43.00	45.00	46.00	47.00
20				4.10	5.15	6.20	7.25	8.30	9.40	10.50	11.45	12.40	14.20	16.00	17.90	19.50	21.00	23.00	24.50	26.00	28.00	29.00	32.00	35.00	38.00	40.00	42.00	43.00	45.00	46.00	57.00	48.00
22				4.20	5.25	6.30	7.45	8.60	9.70	10.80	11.75	12.70	14.60	16.50	18.40	20.00	22.00	24.00	25.00	27.00	29.00	30.00	33.00	36.00	39.00	41.00	43.00	44.00	46.00	47.00	48.00	50.00
23				4.30	5.40	6.50	7.65	8.80	10.00	11.20	12.15	13.10	15.00	17.00	18.90	21.00	22.50	24.50	26.00	27.50	29.50	31.00	33.50	37.00	40.00	42.00	44.00	46.00	47.00	49.00	50.00	51.00
24				4.40	5.50	6.60	7.80	9.00	10.20	11.40	12.40	13.40	15.40	17.40	19.40	21.50	23.00	25.00	27.00	28.00	30.00	32.00	34.00	38.00	41.00	43.00	45.00	47.00	48.00	50.00	51.00	52.00
25				4.50	5.65	6.80	8.00	9.20	10.45	11.70	12.70	13.70	15.80	17.50	19.80	22.00	23.50	26.00	27.50	29.00	31.00	32.50	35.00	38.50	42.00	44.00	46.00	48.00	50.00	51.00	52.00	53.00
26				4.60	5.80	7.00	8.00	9.00	10.50	12.00	13.05	14.10	16.20	18.30	20.00	22.50	24.00	26.50	28.00	30.00	31.50	33.00	36.00	39.00	43.00	45.00	47.00	49.00	51.00	52.00	53.00	55.00
28				4.70	5.90	7.10	8.35	9.60	10.95	12.30	13.35	14.40	16.50	18.70	21.00	23.00	25.00	27.00	29.00	30.50	32.00	34.00	37.00	40.00	44.00	46.00	48.00	50.00	52.00	53.00	55.00	56.00
29				4.80	6.05	7.30	8.60	9.90	11.20	12.50	13.60	14.70	16.80	19.00	21.50	23.50	25.50	27.50	30.00	31.00	33.00	35.00	38.00	41.00	45.00	47.00	50.00	51.00	53.00	55.00	56.00	57.00
30				4.90	6.15	7.40	8.75	10.10	11.40	12.70	13.85	15.00	17.20	19.40	22.00	24.00	26.00	28.00	30.50	32.00	34.00	35.50	38.50	42.00	45.50	48.00	51.00	52.00	54.00	56.00	57.00	58.00
31				5.00	6.30	7.60	8.95	10.30	11.65	13.00	14.15	15.30	17.50	19.80	22.50	24.50	26.50	28.50	31.00	32.50	34.50	36.00	39.00	43.00	46.00	49.00	52.00	53.00	55.00	57.00	58.00	60.00
32				5.10	6.40	7.70	9.10	10.50	11.90	13.30	14.40	15.50	17.80	20.00	23.00	25.00	27.00	29.00	31.50	33.00	35.00	37.00	40.00	44.00	47.00	50.00	53.00	54.00	56.00	58.00	59.00	61.00
34				5.15	6.48	7.80	9.25	10.70	12.10	13.50	14.65	15.80	18.20	21.00	23.25	25.25	27.25	30.00	32.00	33.25	35.25	38.00	41.00	44.50	48.00	51.00	54.00	55.00	57.00	59.00	60.00	62.00

SAN LUIS CANAL COMPANY GATE MEASUREMENTS

18" Stainless Steel Rectangular Gate

Head	Net Gate Opening (Inches)																						
(Inches)	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8	9	10	11	12	13	14	15	16	17	18
0.5	0.02	0.05	0.09	0.13	0.18	0.23	0.28	0.34	0.40	0.46	0.52	0.58	0.72	0.86	1.01	1.17	1.34	1.51	1.71	1.92	2.07	2.21	2.26	2.28
0.75	0.02	0.06	0.11	0.16	0.22	0.28	0.35	0.42	0.49	0.56	0.64	0.71	0.88	1.05	1.24	1.43	1.64	1.85	2.10	2.36	2.54	2.70	2.77	2.79
1	0.02	0.07	0.12	0.19	0.25	0.33	0.40	0.48	0.56	0.65	0.73	0.82	1.01	1.21	1.43	1.65	1.89	2.13	2.43	2.72	2.93	3.12	3.20	3.22
1.25	0.03	0.08	0.14	0.21	0.28	0.37	0.45	0.54	0.63	0.72	0.82	0.92	1.13	1.36	1.60	1.85	2.11	2.39	2.71	3.04	3.28	3.49	3.58	3.60
1.5	0.03	0.08	0.15	0.23	0.31	0.40	0.49	0.59	0.69	0.79	0.90	1.01	1.24	1.49	1.75	2.02	2.32	2.61	2.97	3.33	3.59	3.82	3.92	3.95
1.75	0.03	0.09	0.16	0.25	0.34	0.43	0.53	0.63	0.74	0.86	0.97	1.09	1.34	1.61	1.89	2.19	2.50	2.82	3.21	3.60	3.88	4.13	4.24	4.26
2	0.03	0.09	0.17	0.26	0.36	0.46	0.57	0.68	0.80	0.92	1.04	1.16	1.44	1.72	2.02	2.34	2.67	3.02	3.43	3.85	4.15	4.42	4.53	4.56
2.25	0.04	0.10	0.18	0.28	0.38	0.49	0.60	0.72	0.84	0.97	1.10	1.23	1.52	1.82	2.15	2.48	2.84	3.20	3.64	4.08	4.40	4.68	4.80	4.84
2.5	0.04	0.11	0.19	0.29	0.40	0.52	0.64	0.76	0.89	1.02	1.16	1.30	1.60	1.92	2.26	2.61	2.99	3.37	3.83	4.30	4.63	4.94	5.06	5.10
2.75	0.04	0.11	0.20	0.31	0.42	0.54	0.67	0.79	0.93	1.07	1.22	1.36	1.68	2.01	2.37	2.74	3.14	3.54	4.02	4.51	4.86	5.18	5.31	5.35
3	0.04	0.12	0.21	0.32	0.44	0.57	0.70	0.83	0.97	1.12	1.27	1.42	1.76	2.10	2.48	2.86	3.28	3.70	4.20	4.71	5.08	5.41	5.55	5.58
3.25	0.04	0.12	0.22	0.34	0.46	0.59	0.72	0.86	1.01	1.17	1.32	1.48	1.83	2.19	2.58	2.98	3.41	3.85	4.37	4.90	5.28	5.63	5.77	5.81
3.5	0.04	0.13	0.23	0.35	0.48	0.61	0.75	0.90	1.05	1.21	1.37	1.54	1.90	2.27	2.68	3.09	3.54	3.99	4.54	5.09	5.48	5.84	5.99	6.03
3.75	0.05	0.13	0.24	0.36	0.49	0.63	0.78	0.93	1.09	1.25	1.42	1.59	1.97	2.35	2.77	3.20	3.66	4.13	4.70	5.27	5.68	6.05	6.20	6.24
4	0.05	0.13	0.24	0.37	0.51	0.65	0.80	0.96	1.12	1.30	1.47	1.64	2.03	2.43	2.86	3.30	3.78	4.27	4.85	5.44	5.86	6.24	6.41	6.45
4.25	0.05	0.14	0.25	0.38	0.52	0.67	0.83	0.99	1.16	1.33	1.51	1.69	2.09	2.50	2.95	3.41	3.90	4.40	5.00	5.61	6.04	6.44	6.60	6.65
4.5	0.05	0.14	0.26	0.40	0.54	0.69	0.85	1.02	1.19	1.37	1.56	1.74	2.15	2.57	3.03	3.50	4.01	4.53	5.14	5.77	6.22	6.62	6.79	6.84
4.75	0.05	0.15	0.27	0.41	0.55	0.71	0.88	1.04	1.23	1.41	1.60	1.79	2.21	2.65	3.12	3.60	4.12	4.65	5.29	5.93	6.39	6.81	6.98	7.03
5	0.05	0.15	0.27	0.42	0.57	0.73	0.90	1.07	1.26	1.45	1.64	1.84	2.27	2.71	3.20	3.69	4.23	4.77	5.42	6.08	6.55	6.98	7.16	7.21
5.5	0.06	0.16	0.29	0.44	0.60	0.77	0.94	1.12	1.32	1.52	1.72	1.93	2.38	2.85	3.35	3.87	4.44	5.00	5.69	6.38	6.87	7.32	7.51	7.56
6	0.06	0.16	0.30	0.46	0.62	0.80	0.98	1.17	1.38	1.59	1.80	2.01	2.49	2.97	3.50	4.05	4.63	5.23	5.94	6.66	7.18	7.65	7.84	7.90
6.5	0.06	0.17	0.31	0.48	0.65	0.83	1.03	1.22	1.43	1.65	1.87	2.10	2.59	3.09	3.65	4.21	4.82	5.44	6.18	6.93	7.47	7.96	8.16	8.22
7	0.06	0.18	0.32	0.49	0.67	0.86	1.06	1.27	1.49	1.71	1.94	2.17	2.69	3.21	3.78	4.37	5.00	5.65	6.42	7.20	7.75	8.26	8.47	8.53
7.5	0.07	0.18	0.33	0.51	0.70	0.90	1.10	1.31	1.54	1.77	2.01	2.25	2.78	3.32	3.92	4.52	5.18	5.84	6.64	7.45	8.03	8.55	8.77	8.83
8	0.07	0.19	0.35	0.53	0.72	0.92	1.14	1.36	1.59	1.83	2.08	2.32	2.87	3.43	4.05	4.67	5.35	6.04	6.86	7.69	8.29	8.83	9.06	9.12
8.5	0.07	0.20	0.36	0.54	0.74	0.95	1.17	1.40	1.64	1.89	2.14	2.40	2.96	3.54	4.17	4.82	5.51	6.22	7.07	7.93	8.55	9.10	9.34	9.40
9	0.07	0.20	0.37	0.56	0.76	0.98	1.21	1.44	1.69	1.94	2.20	2.47	3.04	3.64	4.29	4.96	5.67	6.40	7.28	8.16	8.79	9.37	9.61	9.67
9.5	0.07	0.21	0.38	0.57	0.78	1.01	1.24	1.48	1.73	2.00	2.26	2.53	3.13	3.74	4.41	5.09	5.83	6.58	7.47	8.38	9.03	9.62	9.87	9.94
10	0.08	0.21	0.39	0.59	0.81	1.03	1.27	1.52	1.78	2.05	2.32	2.60	3.21	3.84	4.52	5.22	5.98	6.75	7.67	8.60	9.27	9.87	10.13	10.20
11	0.08	0.22	0.41	0.62	0.84	1.08	1.33	1.59	1.87	2.15	2.43	2.73	3.37	4.03	4.74	5.48	6.27	7.08	8.04	9.02	9.72	10.36	10.62	10.69
12	0.08	0.23	0.42	0.65	0.88	1.13	1.39	1.66	1.95	2.24	2.54	2.85	3.52	4.20	4.96	5.72	6.55	7.39	8.40	9.42	10.15	10.82	11.09	11.17
13	0.09	0.24	0.44	0.67	0.92	1.18	1.45	1.73	2.03	2.33	2.65	2.96	3.66	4.38	5.16	5.96	6.82	7.69	8.74	9.81	10.57	11.26	11.55	11.62
14	0.09	0.25	0.46	0.70	0.95	1.22	1.50	1.79	2.10	2.42	2.75	3.08	3.80	4.54	5.35	6.18	7.08	7.98	9.07	10.18	10.97	11.68	11.98	12.06
15	0.09	0.26	0.47	0.72	0.99	1.27	1.56	1.86	2.18	2.51	2.84	3.18	3.93	4.70	5.54	6.40	7.33	8.26	9.39	10.53	11.35	12.09	12.40	12.49

SAN LUIS CANAL COMPANY GATE MEASUREMENTS

18" Stainless Steel Rectangular Gate

Head (Inches)	Net Gate Opening (Inches) 0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8	9	10	11	12	13	14	15	16	17	18
16	0.10	0.27	0.49	0.75	1.02	1.31	1.61	1.92	2.25	2.59	2.94	3.29	4.06	4.86	5.72	6.61	7.57	8.53	9.70	10.88	11.72	12.49	12.81	12.90
17	0.10	0.28	0.50	0.77	1.05	1.35	1.66	1.98	2.32	2.67	3.03	3.39	4.18	5.00	5.90	6.81	7.80	8.80	10.00	11.21	12.09	12.87	13.20	13.29
18	0.10	0.28	0.52	0.79	1.08	1.39	1.71	2.03	2.39	2.75	3.11	3.49	4.31	5.15	6.07	7.01	8.02	9.05	10.29	11.54	12.44	13.25	13.59	13.68
19	0.10	0.29	0.53	0.81	1.11	1.42	1.75	2.09	2.45	2.82	3.20	3.58	4.42	5.29	6.24	7.20	8.24	9.30	10.57	11.86	12.78	13.61	13.96	14.05
20	0.11	0.30	0.55	0.83	1.14	1.46	1.80	2.14	2.52	2.90	3.28	3.68	4.54	5.43	6.40	7.39	8.46	9.54	10.85	12.16	13.11	13.96	14.32	14.42
21	0.11	0.31	0.56	0.85	1.17	1.50	1.84	2.20	2.58	2.97	3.36	3.77	4.65	5.56	6.56	7.57	8.67	9.78	11.11	12.46	13.43	14.31	14.68	14.77
22	0.11	0.31	0.57	0.87	1.19	1.53	1.89	2.25	2.64	3.04	3.44	3.85	4.76	5.69	6.71	7.75	8.87	10.01	11.37	12.76	13.75	14.65	15.02	15.12
23	0.11	0.32	0.59	0.89	1.22	1.57	1.93	2.30	2.70	3.11	3.52	3.94	4.87	5.82	6.86	7.92	9.07	10.23	11.63	13.04	14.06	14.97	15.36	15.46
24	0.12	0.33	0.60	0.91	1.25	1.60	1.97	2.35	2.76	3.17	3.60	4.03	4.97	5.95	7.01	8.09	9.27	10.45	11.88	13.32	14.36	15.30	15.69	15.79
25	0.12	0.34	0.61	0.93	1.27	1.63	2.01	2.40	2.81	3.24	3.67	4.11	5.07	6.07	7.15	8.26	9.46	10.67	12.13	13.60	14.66	15.61	16.01	16.12
26	0.12	0.34	0.62	0.95	1.30	1.67	2.05	2.44	2.87	3.30	3.74	4.19	5.18	6.19	7.29	8.42	9.64	10.88	12.37	13.87	14.95	15.92	16.33	16.44
27	0.12	0.35	0.64	0.97	1.32	1.70	2.09	2.49	2.92	3.36	3.81	4.27	5.27	6.31	7.43	8.58	9.83	11.09	12.60	14.13	15.23	16.22	16.64	16.75
28	0.13	0.36	0.65	0.99	1.35	1.73	2.13	2.54	2.98	3.43	3.88	4.35	5.37	6.42	7.57	8.74	10.01	11.29	12.83	14.39	15.51	16.52	16.95	17.06
29	0.13	0.36	0.66	1.00	1.37	1.76	2.17	2.58	3.03	3.49	3.95	4.43	5.47	6.54	7.70	8.90	10.19	11.49	13.06	14.65	15.78	16.81	17.25	17.36
30	0.13	0.37	0.67	1.02	1.39	1.79	2.20	2.63	3.08	3.55	4.02	4.50	5.56	6.65	7.84	9.05	10.36	11.69	13.28	14.90	16.05	17.10	17.54	17.66
31	0.13	0.37	0.68	1.04	1.42	1.82	2.24	2.67	3.13	3.61	4.09	4.58	5.65	6.76	7.96	9.20	10.53	11.88	13.50	15.14	16.32	17.38	17.83	17.95
32	0.14	0.38	0.69	1.05	1.44	1.85	2.27	2.71	3.18	3.66	4.15	4.65	5.74	6.87	8.09	9.34	10.70	12.07	13.72	15.39	16.58	17.66	18.12	18.24
33	0.14	0.39	0.70	1.07	1.46	1.88	2.31	2.75	3.23	3.72	4.22	4.72	5.83	6.97	8.22	9.49	10.87	12.26	13.93	15.62	16.84	17.94	18.40	18.52
34	0.14	0.39	0.71	1.09	1.48	1.91	2.34	2.80	3.28	3.78	4.28	4.79	5.92	7.08	8.34	9.63	11.03	12.44	14.14	15.86	17.09	18.21	18.67	18.80

SAN LUIS CANAL COMPANY GATE MEASUREMENTS

24" Stainless Steel Rectangular Gate

Net Gate Opening (Inches)

HEAD (Inches)	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0.5	0.04	0.07	0.12	0.18	0.25	0.31	0.38	0.44	0.52	0.60	0.68	0.76	0.93	1.11	1.30	1.49	1.68	1.86	2.06	2.25	2.45	2.65	2.87	3.08	3.28	3.70	3.89	4.05	4.06	4.07
0.75	0.04	0.08	0.15	0.23	0.30	0.38	0.46	0.54	0.64	0.73	0.83	0.93	1.14	1.36	1.60	1.83	2.06	2.28	2.52	2.75	3.00	3.25	3.51	3.77	4.02	4.54	4.76	4.96	4.97	4.98
1	0.05	0.09	0.17	0.26	0.35	0.44	0.54	0.63	0.74	0.85	0.96	1.07	1.32	1.57	1.84	2.11	2.38	2.64	2.91	3.18	3.47	3.75	4.06	4.36	4.64	5.24	5.50	5.73	5.74	5.75
1.25	0.06	0.10	0.19	0.29	0.39	0.50	0.60	0.70	0.82	0.95	1.07	1.20	1.48	1.76	2.06	2.36	2.66	2.95	3.25	3.55	3.88	4.20	4.54	4.87	5.19	5.85	6.15	6.41	6.42	6.43
1.5	0.06	0.11	0.21	0.32	0.43	0.54	0.66	0.77	0.90	1.04	1.18	1.32	1.62	1.93	2.26	2.59	2.91	3.23	3.56	3.89	4.25	4.60	4.97	5.33	5.69	6.41	6.73	7.02	7.03	7.04
1.75	0.07	0.12	0.23	0.34	0.46	0.59	0.71	0.83	0.97	1.12	1.27	1.42	1.75	2.08	2.44	2.80	3.14	3.49	3.85	4.20	4.59	4.96	5.37	5.76	6.14	6.93	7.27	7.58	7.59	7.61
2	0.07	0.13	0.24	0.37	0.50	0.63	0.76	0.89	1.04	1.20	1.36	1.52	1.87	2.23	2.60	2.99	3.36	3.73	4.11	4.49	4.90	5.31	5.74	6.16	6.57	7.41	7.77	8.10	8.12	8.13
2.25	0.08	0.14	0.26	0.39	0.53	0.66	0.80	0.94	1.10	1.27	1.44	1.61	1.98	2.36	2.76	3.17	3.56	3.96	4.36	4.77	5.20	5.63	6.09	6.53	6.97	7.86	8.24	8.59	8.61	8.62
2.5	0.08	0.15	0.27	0.41	0.55	0.70	0.85	0.99	1.16	1.34	1.52	1.70	2.09	2.49	2.91	3.34	3.76	4.17	4.60	5.02	5.48	5.93	6.41	6.89	7.34	8.28	8.69	9.06	9.07	9.09
2.75	0.08	0.15	0.28	0.43	0.58	0.73	0.89	1.04	1.22	1.41	1.59	1.78	2.19	2.61	3.05	3.50	3.94	4.37	4.82	5.27	5.75	6.22	6.73	7.22	7.70	8.68	9.11	9.50	9.52	9.53
3	0.09	0.16	0.30	0.45	0.61	0.77	0.93	1.09	1.28	1.47	1.66	1.86	2.29	2.73	3.19	3.66	4.12	4.57	5.04	5.50	6.00	6.50	7.03	7.54	8.05	9.07	9.52	9.92	9.94	9.96
3.25	0.09	0.17	0.31	0.47	0.63	0.80	0.97	1.13	1.33	1.53	1.73	1.94	2.38	2.84	3.32	3.81	4.28	4.75	5.24	5.73	6.25	6.77	7.31	7.85	8.37	9.44	9.91	10.33	10.35	10.37
3.5	0.10	0.17	0.32	0.49	0.66	0.83	1.00	1.18	1.38	1.59	1.80	2.01	2.47	2.95	3.45	3.95	4.45	4.93	5.44	5.94	6.49	7.02	7.59	8.15	8.69	9.80	10.28	10.72	10.74	10.76
3.75	0.10	0.18	0.33	0.50	0.68	0.86	1.04	1.22	1.43	1.64	1.86	2.08	2.56	3.05	3.57	4.09	4.60	5.11	5.63	6.15	6.71	7.27	7.86	8.43	8.99	10.14	10.64	11.09	11.11	11.13
4	0.10	0.19	0.34	0.52	0.70	0.89	1.07	1.26	1.47	1.70	1.92	2.15	2.64	3.15	3.68	4.23	4.75	5.27	5.82	6.35	6.93	7.51	8.11	8.71	9.29	10.47	10.99	11.46	11.48	11.50
4.25	0.11	0.19	0.35	0.54	0.72	0.91	1.11	1.29	1.52	1.75	1.98	2.22	2.72	3.25	3.80	4.36	4.90	5.44	6.00	6.55	7.15	7.74	8.36	8.98	9.58	10.80	11.33	11.81	11.83	11.85
4.5	0.11	0.20	0.36	0.55	0.74	0.94	1.14	1.33	1.56	1.80	2.04	2.28	2.80	3.34	3.91	4.48	5.04	5.59	6.17	6.74	7.35	7.96	8.61	9.24	9.85	11.11	11.66	12.15	12.17	12.20
4.75	0.11	0.20	0.37	0.57	0.76	0.97	1.17	1.37	1.61	1.85	2.09	2.34	2.88	3.43	4.01	4.61	5.18	5.75	6.34	6.92	7.55	8.18	8.84	9.49	10.12	11.41	11.98	12.49	12.51	12.53
5	0.11	0.21	0.38	0.58	0.78	0.99	1.20	1.40	1.65	1.90	2.15	2.40	2.96	3.52	4.12	4.73	5.31	5.90	6.50	7.10	7.75	8.39	9.07	9.74	10.39	11.71	12.29	12.81	12.83	12.86
5.5	0.12	0.22	0.40	0.61	0.82	1.04	1.26	1.47	1.73	1.99	2.25	2.52	3.10	3.69	4.32	4.96	5.57	6.18	6.82	7.45	8.13	8.80	9.51	10.21	10.89	12.28	12.89	13.44	13.46	13.48
6	0.13	0.23	0.42	0.64	0.86	1.09	1.31	1.54	1.80	2.08	2.35	2.63	3.24	3.86	4.51	5.18	5.82	6.46	7.12	7.78	8.49	9.19	9.94	10.67	11.38	12.83	13.46	14.03	14.06	14.08
6.5	0.13	0.24	0.43	0.66	0.89	1.13	1.37	1.60	1.88	2.16	2.45	2.74	3.37	4.01	4.70	5.39	6.06	6.72	7.42	8.10	8.84	9.57	10.34	11.10	11.84	13.35	14.01	14.61	14.63	14.66
7	0.14	0.25	0.45	0.69	0.93	1.17	1.42	1.66	1.95	2.24	2.54	2.84	3.50	4.17	4.87	5.59	6.29	6.98	7.70	8.40	9.17	9.93	10.73	11.52	12.29	13.85	14.54	15.16	15.18	15.21
7.5	0.14	0.26	0.47	0.71	0.96	1.21	1.47	1.72	2.02	2.32	2.63	2.94	3.62	4.31	5.04	5.79	6.51	7.22	7.97	8.70	9.49	10.28	11.11	11.93	12.72	14.34	15.05	15.69	15.72	15.75
8	0.14	0.26	0.48	0.74	0.99	1.25	1.52	1.78	2.08	2.40	2.72	3.04	3.74	4.45	5.21	5.98	6.72	7.46	8.23	8.98	9.80	10.61	11.47	12.32	13.14	14.81	15.55	16.20	16.23	16.26
8.5	0.15	0.27	0.50	0.76	1.02	1.29	1.56	1.83	2.15	2.47	2.80	3.13	3.85	4.59	5.37	6.16	6.93	7.69	8.48	9.26	10.11	10.94	11.83	12.70	13.54	15.27	16.02	16.70	16.73	16.76
9	0.15	0.28	0.51	0.78	1.05	1.33	1.61	1.88	2.21	2.54	2.88	3.22	3.97	4.72	5.53	6.34	7.13	7.91	8.73	9.53	10.40	11.26	12.17	13.07	13.93	15.71	16.49	17.19	17.22	17.25
9.5	0.16	0.29	0.53	0.80	1.08	1.37	1.65	1.94	2.27	2.61	2.96	3.31	4.07	4.85	5.68	6.51	7.32	8.13	8.97	9.79	10.68	11.57	12.50	13.42	14.32	16.14	16.94	17.66	17.69	17.72
10	0.16	0.30	0.54	0.82	1.11	1.40	1.70	1.99	2.33	2.68	3.04	3.40	4.18	4.98	5.82	6.68	7.52	8.34	9.20	10.05	10.96	11.87	12.83	13.77	14.69	16.56	17.38	18.12	18.15	18.18
11	0.17	0.31	0.57	0.86	1.16	1.47	1.78	2.08	2.44	2.81	3.19	3.57	4.38	5.22	6.11	7.01	7.88	8.75	9.65	10.54	11.50	12.45	13.45	14.44	15.41	17.37	18.23	19.00	19.03	19.07
12	0.18	0.32	0.59	0.90	1.21	1.53	1.86	2.18	2.55	2.94	3.33	3.72	4.58	5.45	6.38	7.32	8.23	9.14	10.08	11.00	12.01	13.00	14.05	15.09	16.09	18.14	19.04	19.85	19.88	19.92
13	0.18	0.34	0.61	0.94	1.26	1.60	1.93	2.26	2.66	3.06	3.46	3.88	4.77	5.68	6.64	7.62	8.57	9.51	10.49	11.45	12.50	13.53	14.63	15.70	16.75	18.88	19.82	20.66	20.69	20.73
14	0.19	0.35	0.64	0.98	1.31	1.66	2.01	2.35	2.76	3.17	3.59	4.02	4.95	5.89	6.89	7.91	8.89	9.87	10.88	11.89	12.97	14.04	15.18	16.30	17.38	19.59	20.57	21.44	21.47	21.51
15	0.20	0.36	0.66	1.01	1.36	1.72	2.08	2.43	2.85	3.28	3.72	4.16	5.12	6.10	7.13	8.18	9.20	10.21	11.27	12.30	13.43	14.53	15.71	16.87	17.99	20.28	21.29	22.19	22.23	22.27
16	0.20	0.37	0.68	1.04	1.40	1.77	2.14	2.51	2.95	3.39	3.84	4.30	5.29	6.30	7.37	8.45	9.51	10.55	11.63	12.71	13.87	15.01	16.23	17.42	18.58	20.95	21.99	22.92	22.95	23.00
17	0.21	0.39	0.70	1.07	1.45	1.83	2.21	2.59	3.04	3.49	3.96	4.43	5.45	6.49	7.59	8.71	9.80	10.87	11.99	13.10	14.29	15.47	16.73	17.96	19.15	21.59	22.66	23.62	23.66	23.71
18	0.22	0.40	0.72	1.11	1.49	1.88	2.27	2.66	3.13	3.60	4.08	4.56	5.61	6.68	7.81	8.97	10.08	11.19	12.34	13.48	14.71	15.92	17.21	18.48	19.71	22.22	23.32	24.31	24.35	24.39
19	0.22	0.41	0.74	1.14	1.53	1.93	2.34	2.74	3.21	3.69	4.19	4.69	5.76	6.86	8.03	9.21	10.36	11.50	12.68	13.85	15.11	16.36	17.68	18.98	20.25	22.83	23.96	24.97	25.01	25.06
20	0.23	0.42	0.76	1.17	1.57	1.98	2.40	2.81	3.29	3.79	4.30	4.81	5.91	7.04	8.24	9.45	10.63	11.79	13.01	14.21	15.50	16.78	18.14	19.48	20.77	23.42	24.58	25.62	25.66	25.71
21	0.23	0.43	0.78	1.19	1.61	2.03	2.46	2.88	3.38	3.88	4.40	4.93	6.06	7.22	8.44	9.68	10.89	12.08	13.33	14.56	15.89	17.20	18.59	19.96	21.29	24.00	25.19	26.25	26.30	26.35
22	0.24	0.44	0.80	1.22	1.64	2.08	2.51	2.95	3.45	3.98	4.51	5.04	6.20	7.38	8.64	9.91	11.15	12.37	13.64	14.90	16.26	17.60	19.03	20.43	21.79	24.56	25.78	26.87	26.92	26.97
23	0.24	0.45	0.82	1.25	1.68	2.13	2.57	3.01	3.53	4.07	4.61	5.16	6.34	7.55	8.83	10.14	11.40	12.65	13.95	15.23	16.62	18.00	19.46	20.89	22.28	25.11	26.36	27.48	27.52	27.57
24	0.25	0.46	0.84	1.28	1.72	2.17	2.63	3.08	3.61	4.15	4.71	5.27	6.47	7.71	9.02	10.35	11.64	12.92	14.25	15.56	16.98	18.39	19.87	21.34	22.76	25.65	26.93	28.07	28.11	28.17
25	0.26	0.47	0.85	1.30	1.75	2.22	2.68	3.14	3.68	4.24	4.80	5.37	6.61	7.87	9.21	10.57	11.88	13.19	14.54	15.88	17.33	18.76	20.28	21.78	23.22	26.18	27.48	28.65	28.69	28.75
26	0.26	0.48	0.87	1.33	1.79	2.26	2.73	3.20	3.76	4.32	4.90	5.48	6.74	8.03	9.39	10.78	12.12	13.45	14.83	16.20	17.68	19.14	20.69	22.21	23.68	26.70	28.03	29.21	29.26	29.32

SAN LUIS CANAL COMPANY GATE MEASUREMENTS

24" Stainless Steel Rectangular Gate

Net Gate Opening (Inches)

24" Stainless Steel Rectangular Gate

Net Gate Opening (Inches)

HEAD (Inches)	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
27	0.27	0.49	0.89	1.35	1.82	2.30	2.79	3.26	3.83	4.40	4.99	5.59	6.87	8.18	9.57	10.98	12.35	13.70	15.11	16.51	18.01	19.50	21.08	22.63	24.14	27.21	28.56	29.77	29.82	29.88
28	0.27	0.49	0.90	1.38	1.86	2.34	2.84	3.32	3.90	4.49	5.08	5.69	6.99	8.33	9.75	11.18	12.58	13.95	15.39	16.81	18.34	19.86	21.47	23.05	24.58	27.71	29.08	30.32	30.37	30.42
29	0.27	0.50	0.92	1.40	1.89	2.39	2.89	3.38	3.97	4.56	5.17	5.79	7.12	8.48	9.92	11.38	12.80	14.20	15.66	17.11	18.67	20.21	21.85	23.45	25.01	28.20	29.60	30.85	30.90	30.96
30	0.28	0.51	0.93	1.43	1.92	2.43	2.94	3.44	4.03	4.64	5.26	5.89	7.24	8.62	10.09	11.58	13.02	14.44	15.93	17.40	18.99	20.56	22.22	23.85	25.44	28.68	30.11	31.38	31.43	31.49
31	0.28	0.52	0.95	1.45	1.95	2.47	2.99	3.50	4.10	4.72	5.35	5.99	7.36	8.77	10.25	11.77	13.23	14.68	16.19	17.69	19.30	20.90	22.59	24.25	25.86	29.16	30.60	31.90	31.95	32.01
32	0.29	0.53	0.96	1.47	1.98	2.51	3.03	3.55	4.17	4.80	5.43	6.08	7.48	8.91	10.42	11.95	13.44	14.92	16.45	17.97	19.61	21.23	22.95	24.64	26.28	29.62	31.09	32.41	32.46	32.52
33	0.29	0.54	0.98	1.50	2.01	2.55	3.08	3.61	4.23	4.87	5.52	6.18	7.59	9.04	10.58	12.14	13.65	15.15	16.71	18.25	19.91	21.56	23.30	25.02	26.68	30.08	31.57	32.91	32.97	33.03
34	0.30	0.54	0.99	1.52	2.04	2.58	3.13	3.66	4.29	4.94	5.60	6.27	7.71	9.18	10.74	12.32	13.86	15.38	16.96	18.52	20.21	21.88	23.65	25.39	27.08	30.53	32.05	33.41	33.46	33.52

Attachment C3

Measurement Device Documentation

Example calculations and Photos of Turnouts

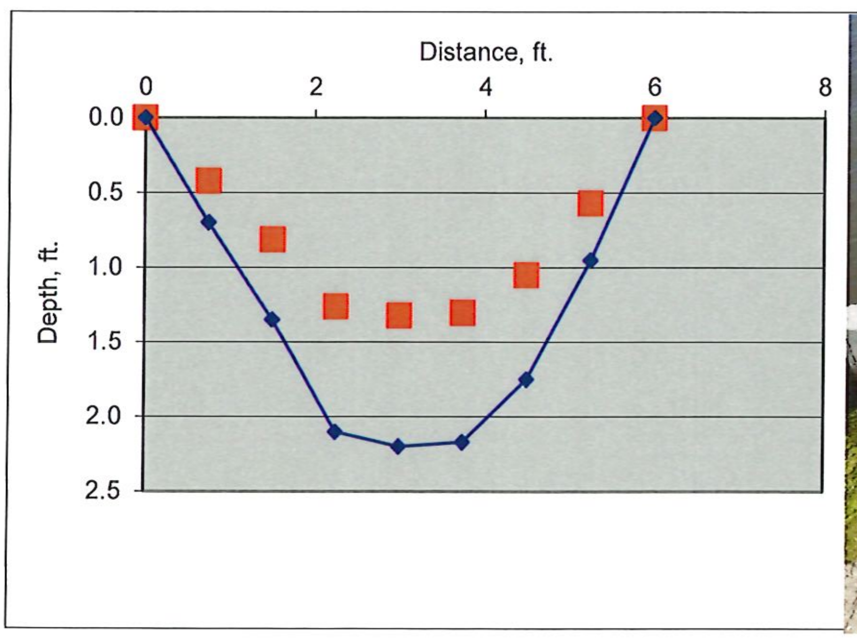
DATE: 5/15/2024 **TIME:** 10:00

GATE: DE196+048L

Dist. from Point	Depth	Depth of Observation	VELOCITY At Point	VELOCITY Mean In Section	AREA Mean Depth	AREA Width	Discharge CFS
0	0.00	0.0	0.00				
0.8	0.70	0.4	0.36	0.18	0.35	0.8	0.05
1.5	1.35	0.8	0.44	0.40	1.03	0.8	0.31
2.3	2.10	1.3	0.35	0.39	1.73	0.8	0.51
3.0	2.20	1.3	0.32	0.33	2.15	0.8	0.54
3.8	2.17	1.3	0.26	0.29	2.19	0.8	0.48
4.5	1.75	1.1	0.29	0.28	1.96	0.8	0.40
5.3	0.95	0.6	0.30	0.30	1.35	0.8	0.30
6.0	0.00	0.0	0.00	0.15	0.48	0.8	0.05
						Flow	**2.63**

Gate Type	SS
Gate Size	18
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	7.00	
Opening, in.	Stem	MID rod
	7(9.5-2.5)	
Flow from Manufacturer's Table, cfs	**2.69**	
Diff., cfs	0.1	
Accuracy, %	2%	

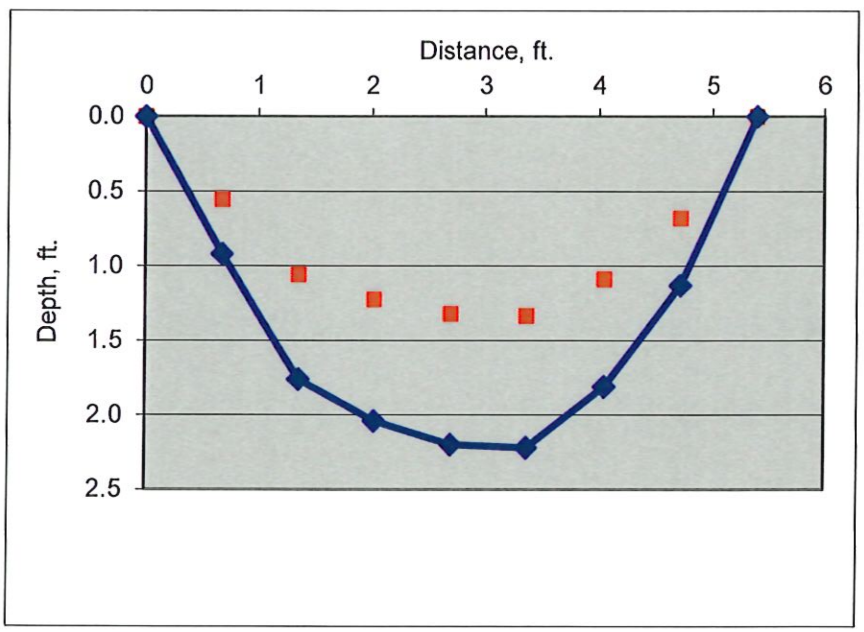


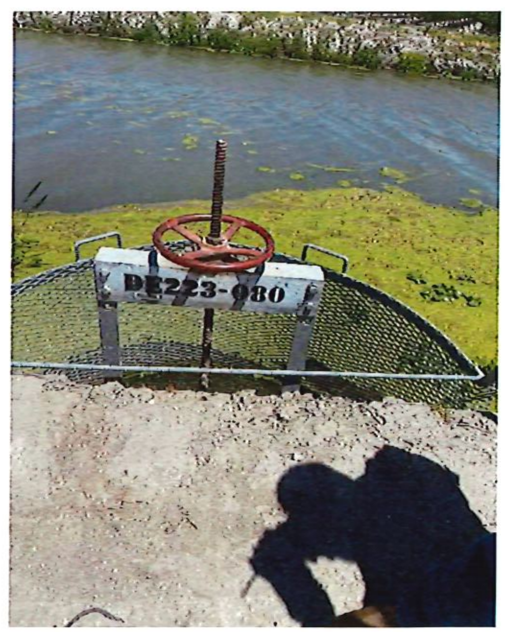
DATE:	5/15/2024		**TIME:**	13:30
GATE:		DE223+080L		

Dist. from Point	Depth	Depth of Observation	VELOCITY		AREA		Discharge CFS
			At Point	Mean In Section	Mean Depth	Width	
0	0.00	0.0	0.00				
0.7	0.92	0.6	0.10	0.05	0.46	0.7	0.02
1.4	1.76	1.1	0.41	0.26	1.34	0.7	0.23
2.0	2.04	1.2	0.52	0.47	1.90	0.7	0.59
2.7	2.20	1.3	0.48	0.50	2.12	0.7	0.72
3.4	2.22	1.3	0.56	0.52	2.21	0.7	0.77
4.1	1.81	1.1	0.60	0.58	2.02	0.7	0.79
4.7	1.13	0.7	0.46	0.53	1.47	0.7	0.52
5.4	0.00	0.0	0.00	0.23	0.57	0.7	0.09
						Flow	**3.73**

Gate Type	W	
Gate Size	18	
Label	Yes	
W. Tube position		No
W. Tube clean	Yes	

Head, in.	6.00	
Opening, in.	Stem	MID rod
	6.5(7-0.5)	
Flow from Manufacturer's Table, cfs	**3.43**	
Diff., cfs	-0.3	
Accuracy, %	-8%	





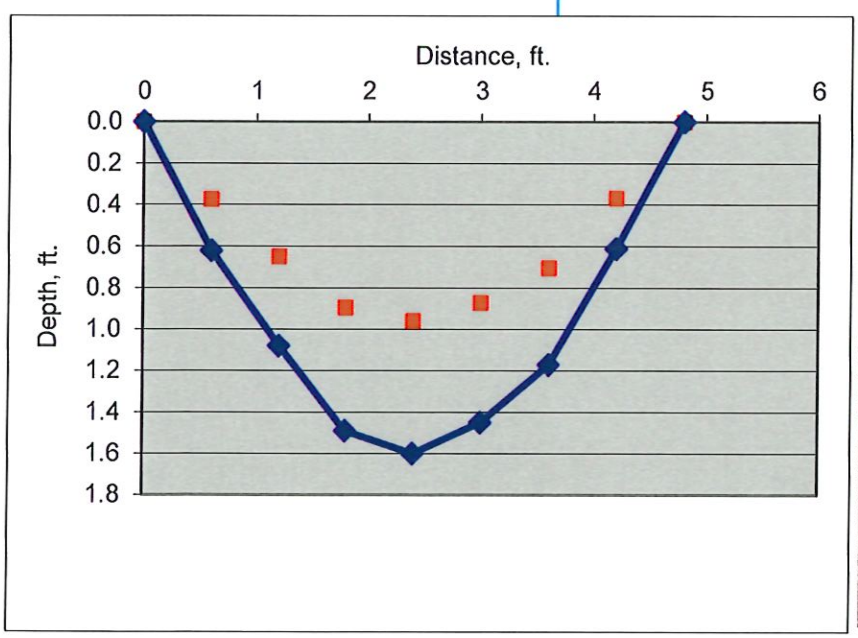
DATE: 5/16/2024 TIME: 8:30

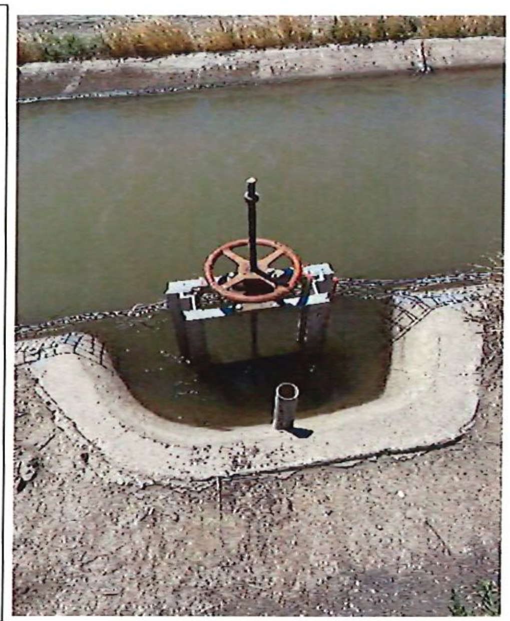
GATE: TO066+041R A

Dist. from Point	Depth	Depth of Observation	VELOCITY At Point	VELOCITY Mean In Section	AREA Mean Depth	AREA Width	Discharge CFS
0	0.00	0.0	0.00				
0.6	0.62	0.4	0.36	0.18	0.31	0.6	0.03
1.2	1.08	0.6	0.53	0.45	0.85	0.6	0.23
1.8	1.49	0.9	0.54	0.54	1.29	0.6	0.41
2.4	1.60	1.0	0.47	0.51	1.55	0.6	0.47
3.0	1.45	0.9	0.52	0.50	1.53	0.6	0.45
3.6	1.17	0.7	0.49	0.51	1.31	0.6	0.40
4.2	0.61	0.4	0.39	0.44	0.89	0.6	0.23
4.8	0.00	0.0	0.00	0.20	0.31	0.6	0.04
						Flow	**2.26**

Gate Type	Allum
Gate Size	12
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	5.50	
Opening, in.	Stem	MID rod
	7.5(9.5-2)	
Flow from Manufacturer's Table, cfs	**2.30**	
Diff., cfs	0.0	
Accuracy, %	2%	





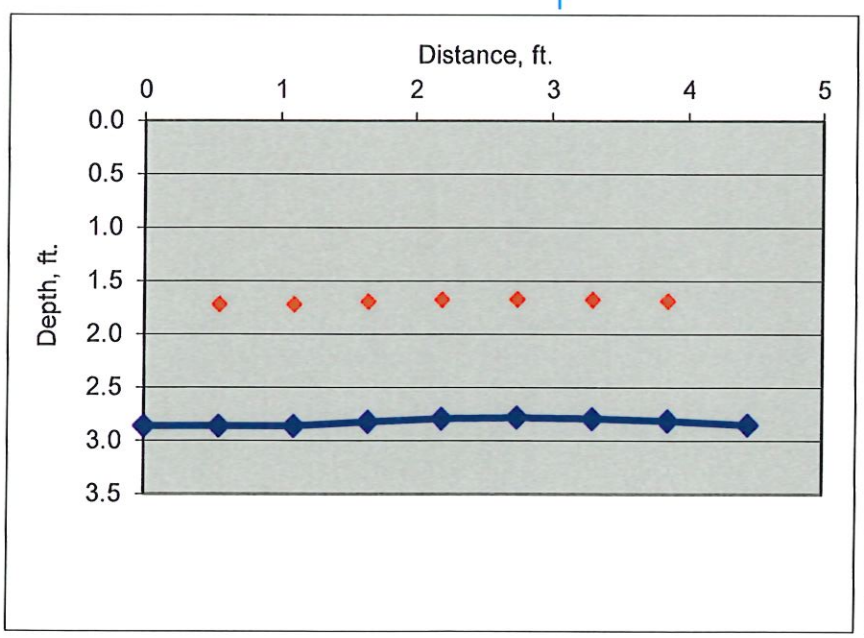
DATE: 5/16/2024 **TIME:** 9:45

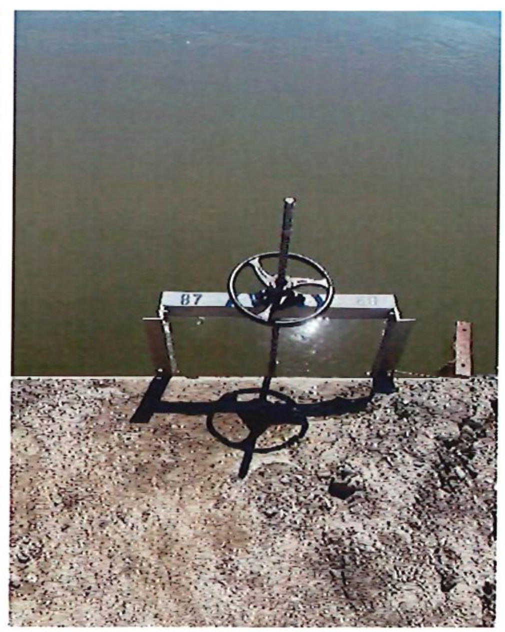
GATE: TS087+060L

Dist. from Point	Depth	Depth of Observation	VELOCITY		AREA		Discharge CFS
			At Point	Mean In Section	Mean Depth	Width	
0	2.86	2.9	0.19				
0.6	2.86	1.7	0.41	0.30	2.86	0.6	0.46
1.1	2.86	1.7	0.39	0.40	2.86	0.6	0.62
1.7	2.82	1.7	0.36	0.37	2.84	0.6	0.58
2.2	2.79	1.7	0.36	0.36	2.81	0.6	0.55
2.8	2.78	1.7	0.32	0.34	2.79	0.6	0.52
3.3	2.79	1.7	0.29	0.30	2.79	0.6	0.46
3.9	2.81	1.7	0.41	0.35	2.80	0.6	0.53
4.5	2.85	2.9	0.27	0.34	2.83	0.6	0.57
						Flow	**4.30**

Gate Type	SS	
Gate Size	24	
Label	Yes	
W. Tube position		No
W. Tube clean		No

Head, in.	16.00	
Opening, in.	Stem	MID rod
	6(8-2)	
Flow from Manufacturer's Table, cfs	**4.33**	
Diff., cfs	0.0	
Accuracy, %	1%	





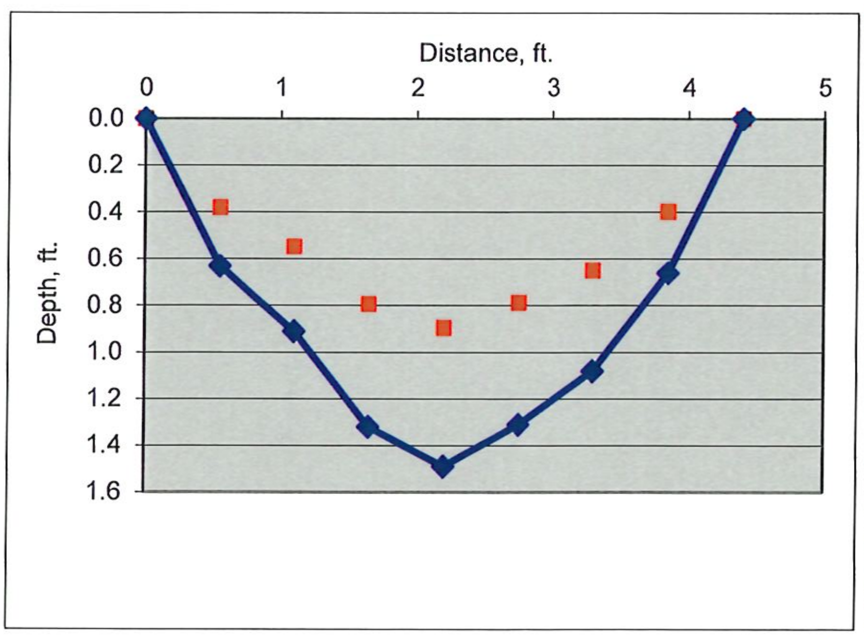
DATE: 5/16/2024 TIME: 12:16

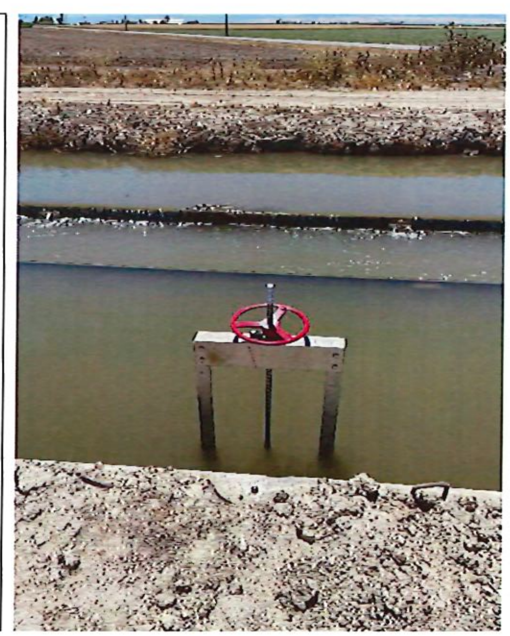
GATE: SW029+029R

Dist. from Point	Depth	Depth of Observation	VELOCITY At Point	VELOCITY Mean In Section	AREA Mean Depth	AREA Width	Discharge CFS
0	0.00	0.0	0.00				
0.6	0.63	0.4	0.42	0.21	0.32	0.6	0.04
1.1	0.91	0.5	0.82	0.62	0.77	0.6	0.26
1.7	1.32	0.8	0.82	0.82	1.12	0.6	0.50
2.2	1.49	0.9	0.90	0.86	1.41	0.6	0.66
2.8	1.31	0.8	0.84	0.87	1.40	0.6	0.67
3.3	1.08	0.6	0.74	0.79	1.20	0.6	0.52
3.9	0.66	0.4	0.63	0.69	0.87	0.6	0.33
4.4	0.00	0.0	0.00	0.32	0.33	0.6	0.06
						Flow	**3.04**

Gate Type	W
Gate Size	18
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	10.50	
Opening, in.	Stem	MID rod
	3.5(4-0.5)	
Flow from Manufacturer's Table, cfs	**3.10**	
Diff., cfs	0.1	
Accuracy, %	2%	



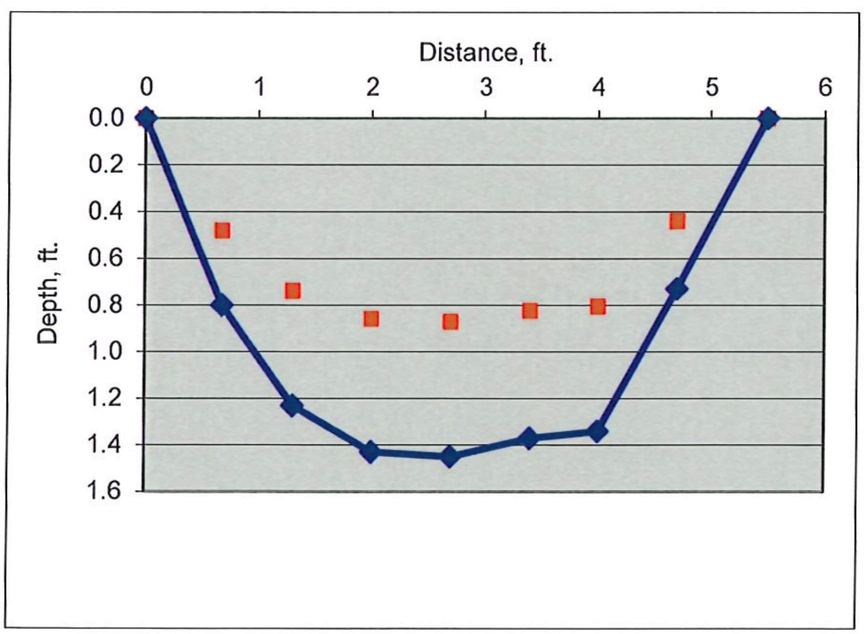


DATE: 5/17/2024 **TIME:** 7:40

GATE: SW103+025R

Dist. from Point	Depth	Depth of Observation	VELOCITY		AREA		Discharge CFS
			At Point	Mean In Section	Mean Depth	Width	
0	0.00	0.0	0.00				
0.7	0.80	0.5	0.76	0.38	0.40	0.7	0.10
1.3	1.23	0.7	1.01	0.89	1.02	0.6	0.56
2.0	1.43	0.9	0.69	0.85	1.33	0.7	0.79
2.7	1.45	0.9	1.10	0.90	1.44	0.7	0.90
3.4	1.37	0.8	1.08	1.09	1.41	0.7	1.08
4.0	1.34	0.8	0.81	0.95	1.36	0.6	0.77
4.7	0.73	0.4	0.64	0.73	1.04	0.7	0.53
5.5	0.00	0.0	0.00	0.32	0.37	0.8	0.09
						Flow	**4.82**

Gate Type	W	Head, in.	6.00
Gate Size	18	Opening, in.	Stem MID rod
Label	Yes		8.75 (9.25-0.5)
W. Tube position	Yes	Flow from Manufacturer's Table, cfs	**4.37**
W. Tube clean	Yes		
		Diff., cfs	-0.4
		Accuracy, %	-9%



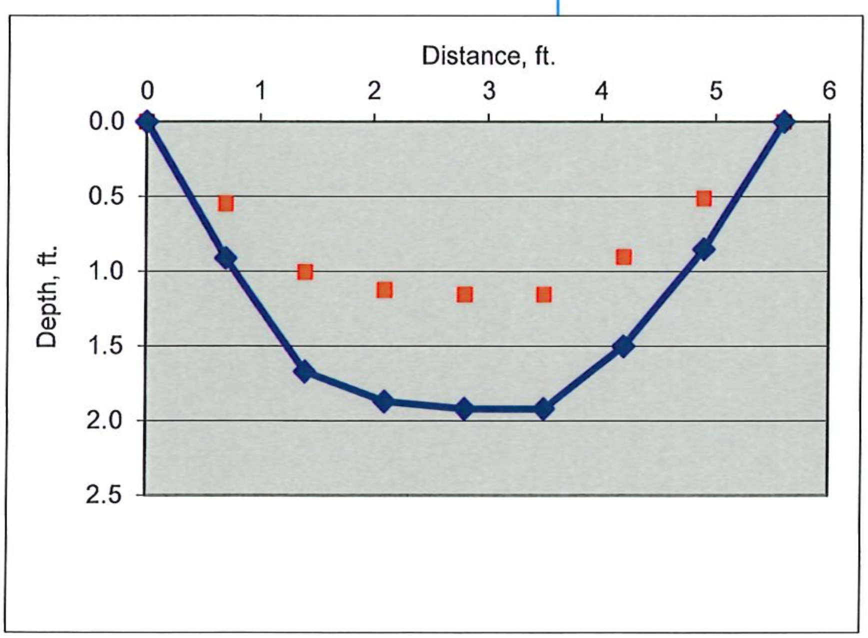
DATE: 5/17/2024 TIME: 12:23

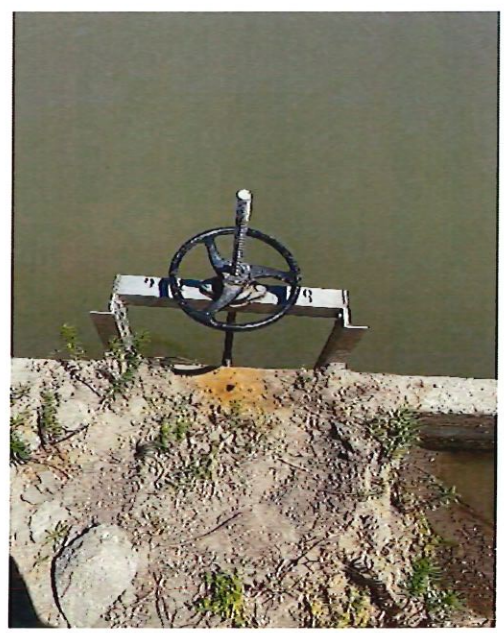
GATE: DE208+028L

Dist. from Point	Depth	Depth of Observation	VELOCITY		AREA		Discharge CFS
			At Point	Mean In Section	Mean Depth	Width	
0	0.00	0.0	0.00				
0.7	0.91	0.5	0.38	0.19	0.46	0.7	0.06
1.4	1.67	1.0	0.46	0.42	1.29	0.7	0.38
2.1	1.87	1.1	0.54	0.50	1.77	0.7	0.62
2.8	1.92	1.2	0.53	0.54	1.90	0.7	0.71
3.5	1.92	1.2	0.43	0.48	1.92	0.7	0.65
4.2	1.50	0.9	0.46	0.45	1.71	0.7	0.53
4.9	0.85	0.5	0.17	0.32	1.18	0.7	0.26
5.6	0.00	0.0	0.00	0.09	0.43	0.7	0.03
						Flow	**3.23**

Gate Type	SS
Gate Size	18
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	13.00	
Opening, in.	Stem	MID rod
	6 (8.5-2.5)	
Flow from Manufacturer's Table, cfs	**2.93**	
Diff., cfs	-0.3	
Accuracy, %	-9%	





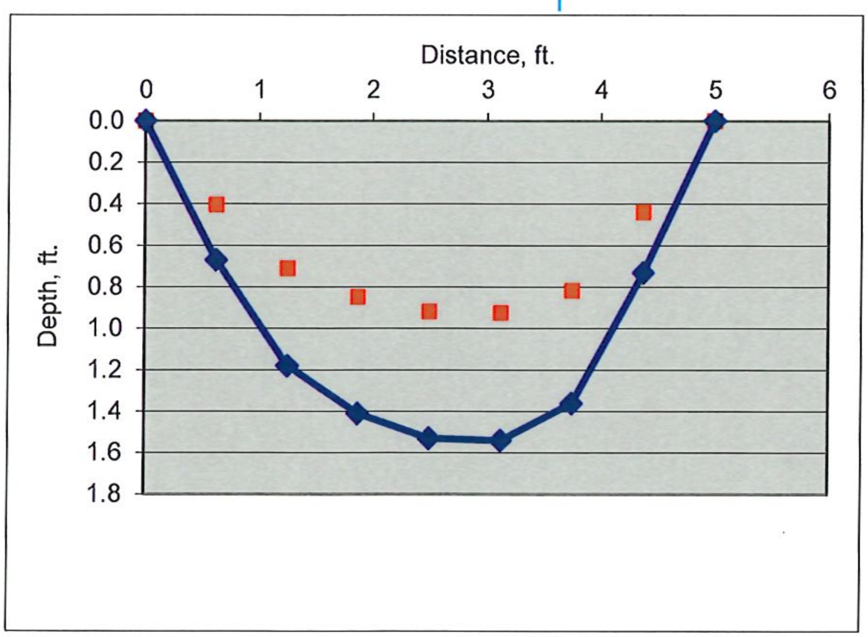
DATE: 5/17/2024 TIME: 12:05

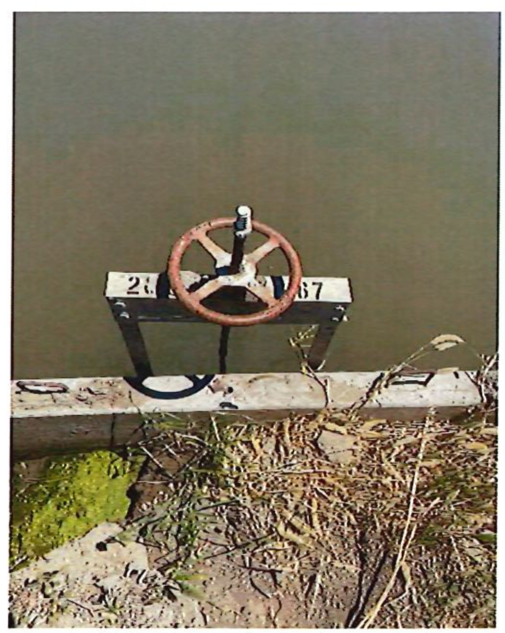
GATE: DE208+067L

Dist. from Point	Depth	Depth of Observation	VELOCITY At Point	VELOCITY Mean In Section	AREA Mean Depth	AREA Width	Discharge CFS
0	0.00	0.0	0.00				
0.6	0.67	0.4	0.52	0.26	0.34	0.6	0.05
1.3	1.18	0.7	0.93	0.73	0.93	0.6	0.42
1.9	1.41	0.8	0.98	0.96	1.30	0.6	0.77
2.5	1.53	0.9	0.89	0.94	1.47	0.6	0.86
3.1	1.54	0.9	0.98	0.94	1.54	0.6	0.90
3.8	1.36	0.8	0.93	0.96	1.45	0.6	0.87
4.4	0.73	0.4	0.88	0.91	1.05	0.6	0.59
5.0	0.00	0.0	0.00	0.44	0.37	0.6	0.10
						Flow	**4.56**

Gate Type	W
Gate Size	18
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	15.00	
Opening, in.	Stem	MID rod
	5.5 (6-0.5)	
Flow from Manufacturer's Table, cfs	**4.78**	
Diff., cfs	0.2	
Accuracy, %	5%	





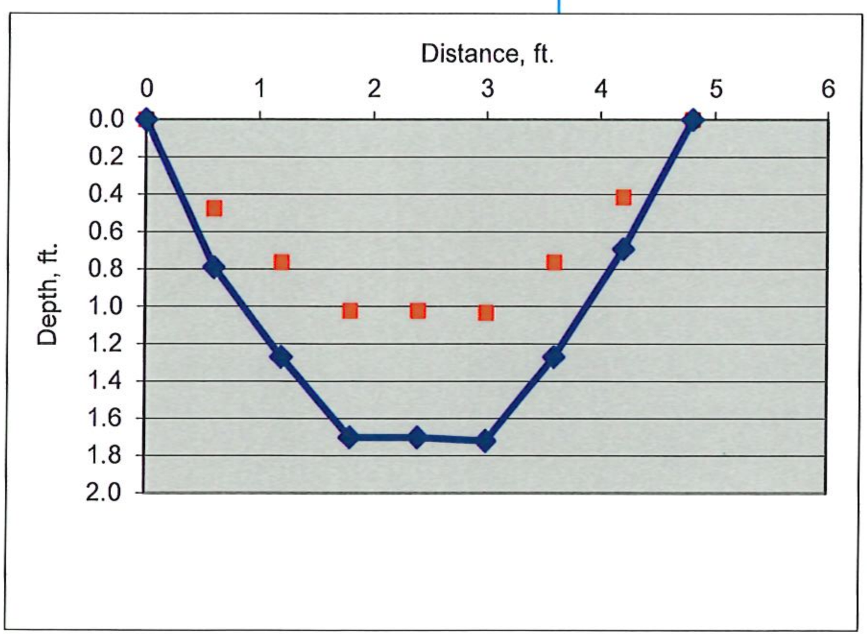
DATE: 5/24/2024 TIME: 8:50

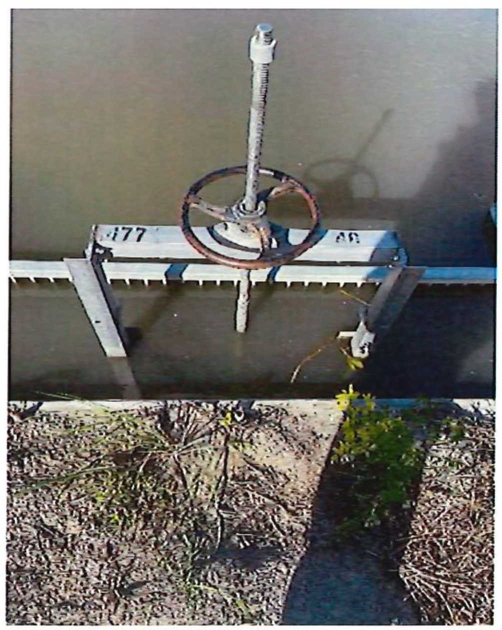
GATE: DE477+046R

Dist. from Point	Depth	Depth of Observation	VELOCITY		AREA		Discharge CFS
			At Point	Mean In Section	Mean Depth	Width	
0	0.00	0.0	0.00				
0.6	0.79	0.5	0.97	0.49	0.40	0.6	0.11
1.2	1.27	0.8	1.32	1.15	1.03	0.6	0.71
1.8	1.70	1.0	1.29	1.31	1.49	0.6	1.16
2.4	1.70	1.0	1.18	1.24	1.70	0.6	1.26
3.0	1.72	1.0	1.17	1.18	1.71	0.6	1.21
3.6	1.27	0.8	1.01	1.09	1.50	0.6	0.98
4.2	0.69	0.4	1.06	1.04	0.98	0.6	0.61
4.8	0.00	0.0	0.00	0.53	0.35	0.6	0.11
						Flow	**6.15**

Gate Type	SS
Gate Size	24
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	5.00	
Opening, in.	Stem	MID rod
	12.5(15-2.5)	
Flow from Manufacturer's Table, cfs	**6.20**	
Diff., cfs	0.1	
Accuracy, %	1%	





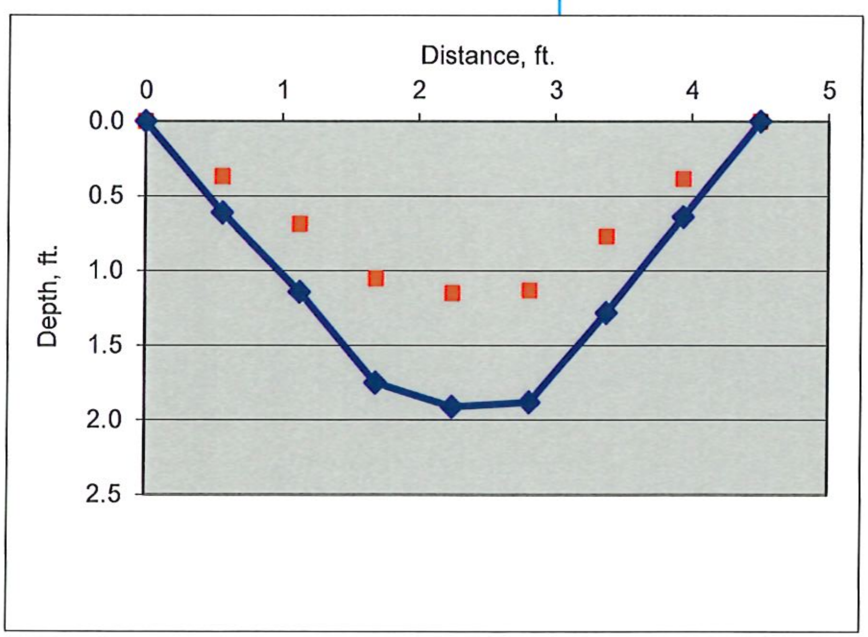
DATE: 5/24/2024 **TIME:** 12:45

GATE: TO007+083L

Dist. from Point	Depth	Depth of Observation	VELOCITY At Point	VELOCITY Mean In Section	AREA Mean Depth	AREA Width	Discharge CFS
0	0.00	0.0	0.00				
0.6	0.61	0.4	0.87	0.44	0.31	0.6	0.07
1.1	1.14	0.7	1.06	0.97	0.88	0.6	0.47
1.7	1.75	1.1	1.08	1.07	1.45	0.6	0.87
2.3	1.91	1.1	1.18	1.13	1.83	0.6	1.16
2.8	1.88	1.1	1.09	1.14	1.90	0.6	1.21
3.4	1.28	0.8	1.19	1.14	1.58	0.6	1.01
3.9	0.64	0.4	1.01	1.10	0.96	0.6	0.59
4.5	0.00	0.0	0.00	0.51	0.32	0.6	0.09
						Flow	**5.49**

Gate Type	W
Gate Size	24
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	5.00	
Opening, in.	Stem	MID rod
	9(10-1)	
Flow from Manufacturer's Table, cfs	**5.73**	
Diff., cfs	0.2	
Accuracy, %	4%	



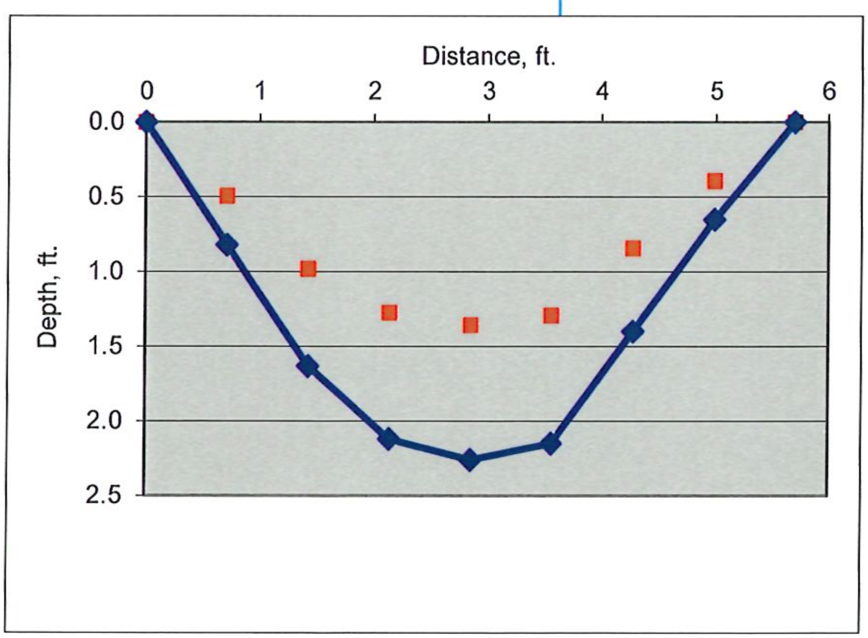
DATE: 5/24/2024 TIME: 13:15

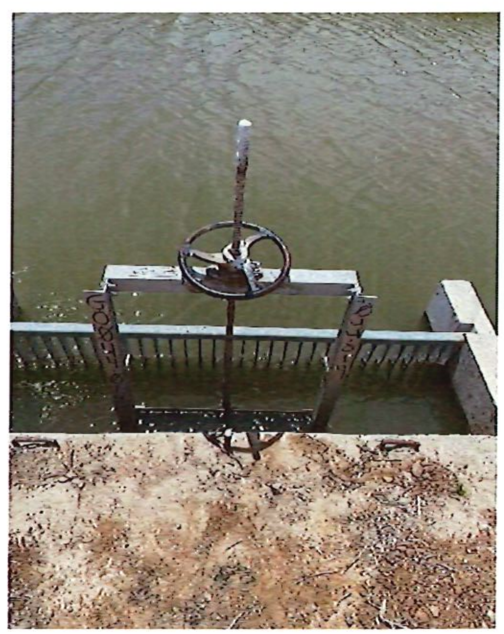
GATE: GO044+019R

Dist. from Point	Depth	Depth of Observation	VELOCITY At Point	VELOCITY Mean In Section	AREA Mean Depth	AREA Width	Discharge CFS
0	0.00	0.0	0.00				
0.7	0.82	0.5	1.05	0.53	0.41	0.7	0.15
1.4	1.63	1.0	1.13	1.09	1.23	0.7	0.95
2.1	2.12	1.3	1.15	1.14	1.88	0.7	1.52
2.9	2.26	1.4	1.19	1.17	2.19	0.7	1.82
3.6	2.15	1.3	1.11	1.15	2.21	0.7	1.81
4.3	1.40	0.8	1.05	1.08	1.78	0.7	1.37
5.0	0.65	0.4	1.05	1.05	1.03	0.7	0.77
5.7	0.00	0.0	0.00	0.53	0.33	0.7	0.12
						Flow	**8.51**

Gate Type	SS
Gate Size	24
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	15.50	
Opening, in.	Stem	MID rod
	9.5(12-2.5)	
Flow from Manufacturer's Table, cfs	**7.79**	
Diff., cfs	-0.7	
Accuracy, %	-8%	



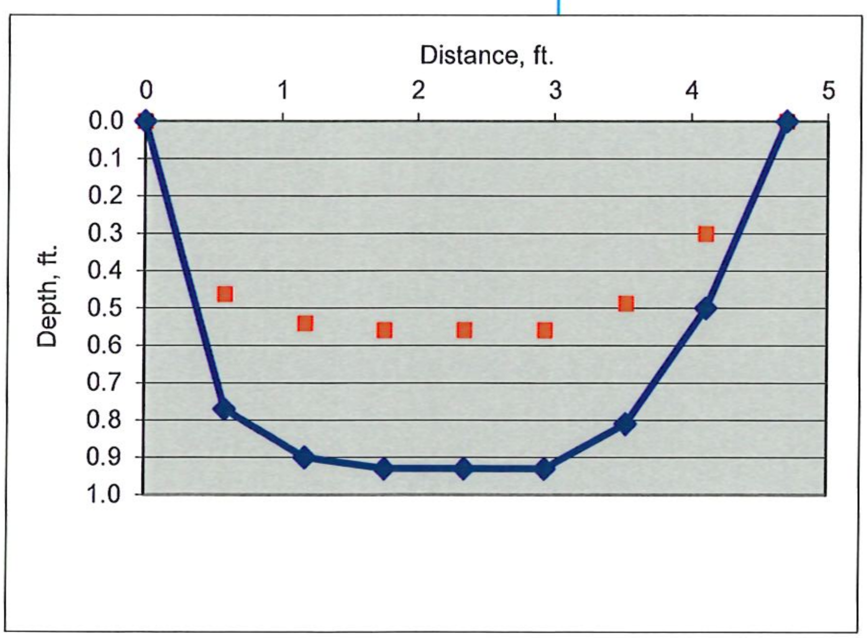


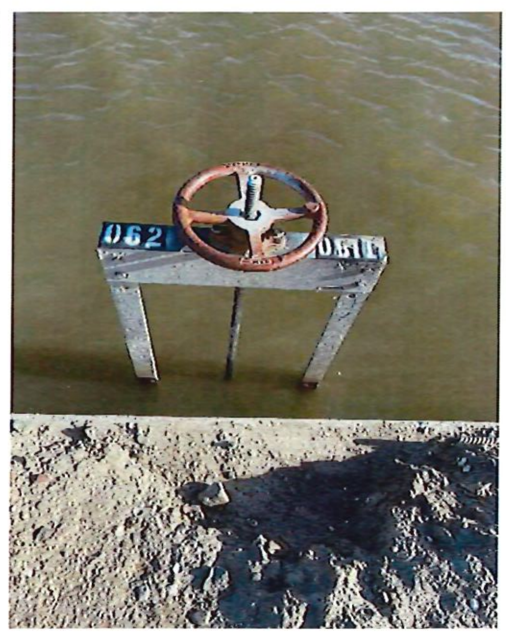
DATE: 5/24/2024 TIME: 7:55

GATE: LT062+081L

Dist. from Point	Depth	Depth of Observation	VELOCITY		AREA		Discharge CFS
			At Point	Mean In Section	Mean Depth	Width	
0	0.00	0.0	0.00				
0.6	0.77	0.5	0.76	0.38	0.39	0.6	0.09
1.2	0.90	0.5	1.39	1.08	0.84	0.6	0.53
1.8	0.93	0.6	1.37	1.38	0.92	0.6	0.74
2.4	0.93	0.6	1.37	1.37	0.93	0.6	0.75
2.9	0.93	0.6	1.42	1.40	0.93	0.6	0.76
3.5	0.81	0.5	1.37	1.40	0.87	0.6	0.71
4.1	0.50	0.3	0.88	1.13	0.66	0.6	0.43
4.7	0.00	0.0	0.00	0.44	0.25	0.6	0.06
						Flow	**4.08**

Gate Type	W	Head, in.	22.00
Gate Size	18	Opening, in.	Stem / MID rod
Label	Yes		
W. Tube position	Yes	Flow from Manufacturer's Table, cfs	**4.01**
W. Tube clean	Yes		
		Diff., cfs	-0.1
		Accuracy, %	-2%





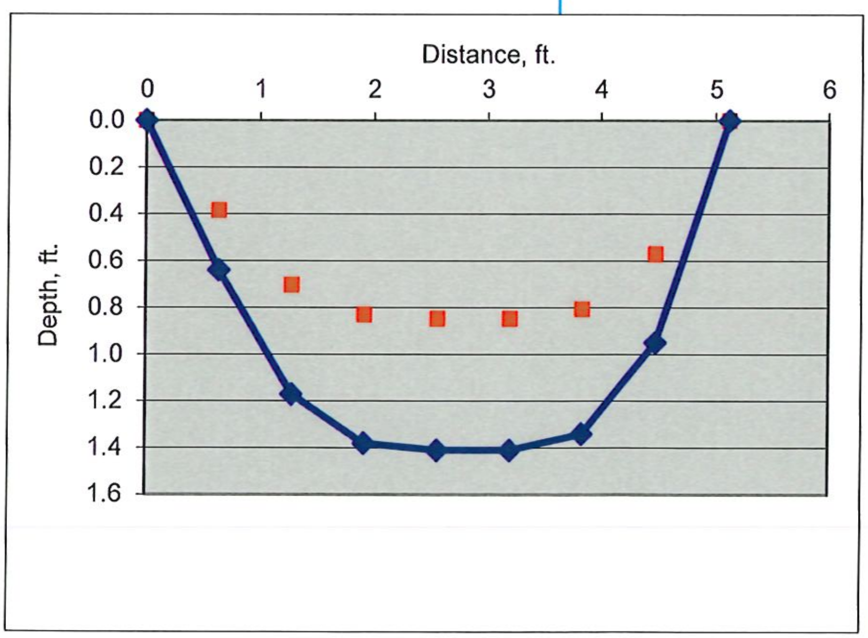
DATE: 5/29/2024 TIME: 7:10

GATE: SJ189+069R

Dist. from Point	Depth	Depth of Observation	VELOCITY At Point	VELOCITY Mean In Section	AREA Mean Depth	AREA Width	Discharge CFS
0	0.00	0.0	0.00				
0.6	0.64	0.4	0.82	0.41	0.32	0.6	0.08
1.3	1.17	0.7	1.03	0.93	0.91	0.6	0.54
1.9	1.38	0.8	1.08	1.06	1.28	0.6	0.86
2.6	1.41	0.8	1.07	1.08	1.40	0.6	0.96
3.2	1.41	0.8	1.03	1.05	1.41	0.6	0.95
3.8	1.34	0.8	0.91	0.97	1.38	0.6	0.85
4.5	0.95	0.6	0.77	0.84	1.15	0.6	0.62
5.1	0.00	0.0	0.00	0.39	0.48	0.6	0.12
						Flow	4.97

Gate Type	W
Gate Size	18
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	3.00
Opening, in.	Stem MID rod
	15.5(15-0.5)
Flow from Manufacturer's Table, cfs	4.57
Diff., cfs	-0.4
Accuracy, %	-8%



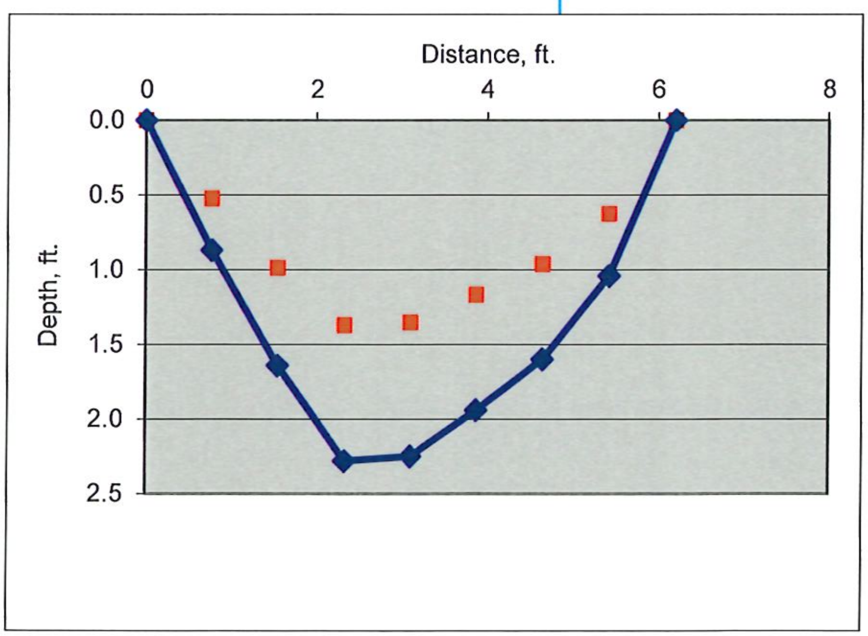
DATE: 5/29/2024 **TIME:** 8:00

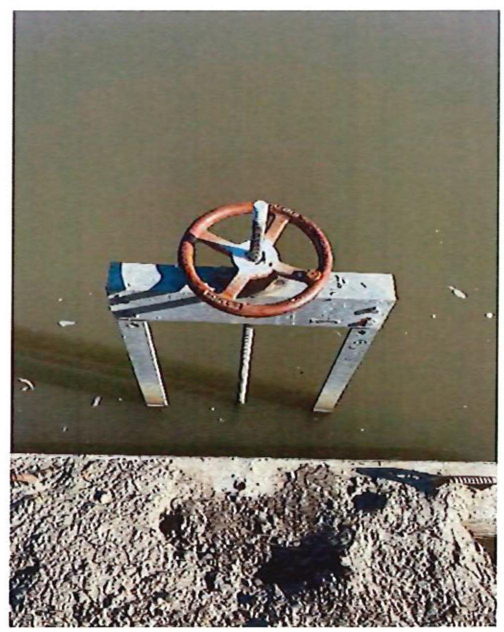
GATE: D1065+043R

Dist. from Point	Depth	Depth of Observation	VELOCITY At Point	VELOCITY Mean In Section	AREA Mean Depth	AREA Width	Discharge CFS
0	0.00	0.0	0.00				
0.8	0.87	0.5	0.10	0.05	0.44	0.8	0.02
1.6	1.64	1.0	0.13	0.12	1.26	0.8	0.11
2.3	2.28	1.4	0.33	0.23	1.96	0.8	0.35
3.1	2.25	1.4	0.49	0.41	2.27	0.8	0.72
3.9	1.94	1.2	0.53	0.51	2.10	0.8	0.83
4.7	1.60	1.0	0.54	0.54	1.77	0.8	0.73
5.4	1.04	0.6	0.54	0.54	1.32	0.8	0.55
6.2	0.00	0.0	0.00	0.27	0.52	0.8	0.11
						Flow	**3.42**

Gate Type	W
Gate Size	18
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	19.00	
Opening, in.	Stem	MID rod
	3.5(4-0.5)	
Flow from Manufacturer's Table, cfs	**3.73**	
Diff., cfs	0.3	
Accuracy, %	9%	





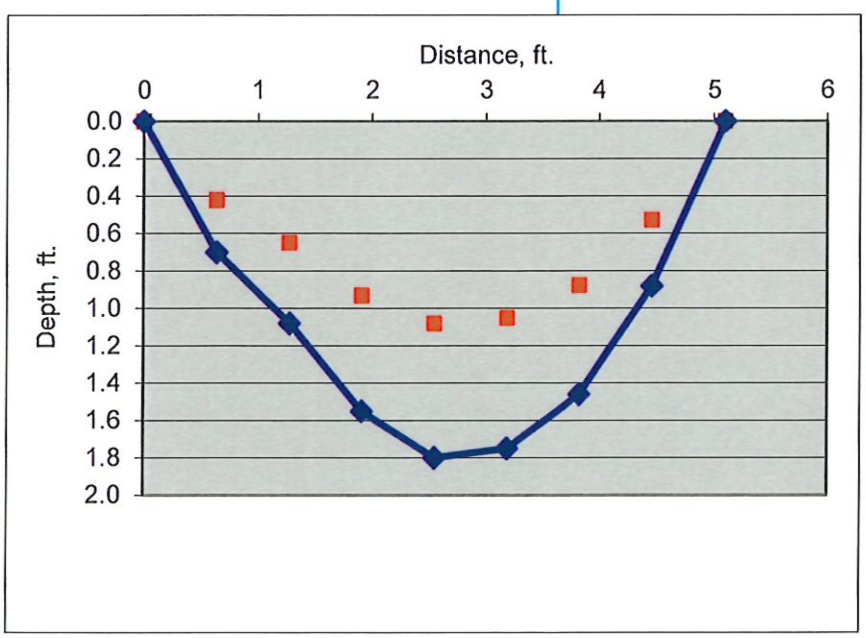
DATE: 5/29/2024 **TIME:** 8:45

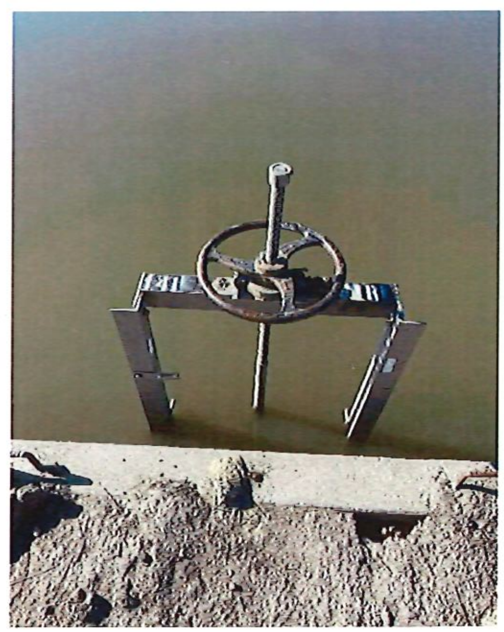
GATE: MI141+081R

Dist. from Point	Depth	Depth of Observation	VELOCITY		AREA		Discharge CFS
			At Point	Mean In Section	Mean Depth	Width	
0	0.00	0.0	0.00				
0.6	0.70	0.4	0.46	0.23	0.35	0.6	0.05
1.3	1.08	0.6	0.44	0.45	0.89	0.6	0.26
1.9	1.55	0.9	0.77	0.61	1.32	0.6	0.51
2.6	1.80	1.1	0.68	0.73	1.68	0.6	0.77
3.2	1.75	1.1	0.70	0.69	1.78	0.6	0.78
3.8	1.46	0.9	0.70	0.70	1.61	0.6	0.72
4.5	0.88	0.5	0.36	0.53	1.17	0.6	0.40
5.1	0.00	0.0	0.00	0.18	0.44	0.6	0.05
						Flow	**3.53**

Gate Type	SS
Gate Size	18
Label	Yes
W. Tube position	Yes
W. Tube clean	Yes

Head, in.	20.00	
Opening, in.	Stem	MID rod
	6 (8.5-2.5)	
Flow from Manufacturer's Table, cfs	**3.68**	
Diff., cfs	0.1	
Accuracy, %	4%	





Attachment C4

Measurement Device Documentation

Example verification logs and Error calculations, Photos of verified Flowmeters

Sample data collection for selected flow meters

Red rows indicate devices that do not meet the required standard

Flow Meter #	Flow Meter Name	Device Type	Acreage Served	% Error	Qualifies?
1	AC314+064L-DRIP	Mag. Meter (Seametrics)	113.1	-3.0	Yes
2	AC344+054R-DRIP	Mag. Meter (Seametrics)	49.5	0.0	Yes
17	D1121+023L-DRIP	Prop. McCrometer	202.3	-1.7	Yes
23	DE337+038L-DRIP	Mag. Meter (Seametrics)	93.0	-3.8	Yes
28	DU038+004L	Prop. McCrometer	162.0	-2.4	Yes
37	ID111+011L-DRIP B	Mag. Meter (Seametrics)	247.2	-9.5	Yes
43	MI099+094L-DRIP	Prop. McCrometer	106.0	-1.7	Yes
63	SJ061+096R-DRIP	Prop. McCrometer	106.0	2.1	Yes
66	SJ154+014L-DRIP	Prop. McCrometer	180.6	-0.5	Yes
68	SJ215+078L-DRIP	Prop. McCrometer	108.5	1.9	Yes
74	SJ446+049L-DRIP	Mag. Meter (Seametrics)	292.6	-3.1	Yes
75	SW157+087R-DRIP	Prop. McCrometer	83.1	-1.8	Yes
81	TO090+019L-DRIP	Prop. McCrometer	138.9	-1.3	Yes
91	TS407+065L-DRIP	Prop. McCrometer	139.6	-2.2	Yes
94	W1027+050L-DRIP	Prop. McCrometer	86.0	5.9	Yes
		Total acreage sample:	2108.3		

		count	%
Flow Meters	OK	15	100%
	Not OK	0	0%

PANAMETRICS PT 900

Flow Verification Date	Time	T.O. ID	Type	Pipe Material	Nominal Pipe Size (in.)	PT900 Measured Value (cfs)	Installed Device Value (cfs)	% Error	Operator Initials	Test Result	Charts/ Graph review & Screenshotsx2	Recorded Log	Picture of installed + PT 900
4/12/2024	13:36	SJ446+049L-DRIP	Seametrics	Stainless Steel	12	6.10	5.91	-3.1	OD	Pass	√	√	√
4/19/2024	13:15	ID111+011L-DRIP B	Seametrics	Carbon Steel	12	3.68	3.33	-9.5	CS, JG, AP	Pass	√	√	√
4/19/2024	10:15	AC344+054R-DRIP	Seametrics	Carbon Steel	6	1.30	1.30	0.0	CS, JG, AP	Pass	√	√	√
4/19/2024	9:11	AC314+064L-DRIP	Seametrics	Stainless Steel	14	2.65	2.57	-3.0	CS, JG, AP	Pass	√	√	√
											√	√	√
4/26/2024	8:26	TS407+065L-DRIP	McCromneter	Carbon Steel	10	3.12	3.05	-2.2	CS, JG, SG, AP	Pass	√	√	√
4/26/2024	9:01	SJ154+014L-DRIP	McCromneter	Carbon Steel	14	5.91	5.88	-0.5	CS, JG, SG, AP	Pass	√	√	√
4/26/2024	9:36	TO090+019L-DRIP	McCromneter	Stainless Steel	12	2.39	2.36	-1.3	CS, JG, SG, AP	Pass	√	√	√
4/26/2024	12:00	DE337+038L-DRIP	Seametrics	Stainless Steel	12	3.67	3.53	-3.8	CS, JG, SG	Pass	√	√	√
											√	√	√
5/31/2024	8:05	D1121+023L-DRIP	McCromneter	Carbon Steel	12	2.90	2.85	-1.7	JG	Pass	√	√	√
5/31/2024	9:15	DU038+004L-DRIP	McCromneter	Carbon Steel	10	3.74	3.65	-2.4	JG	Pass	√	√	√
5/31/2024	12:10	W1027+050L-DRIP	McCromneter	Carbon Steel	12	5.09	5.39	5.9	JG	Pass	√	√	√
6/7/2024	11:52	MI099+094L-DRIP	McCromneter	Carbon Steel	8	2.94	2.89	-1.7	CS, JG	Pass	√	√	√
6/7/2024	13:43	SJ061+096R-DRIP	McCromneter	Stainless Steel	12	2.82	2.88	2.1	CS, JG	Pass	√	√	√
											√	√	√
6/21/2024	6:18	SJ215+078L-DRIP	McCromneter	Stainless Steel	10	2.16	2.20	1.9	CS, JG	Pass	√	√	√
6/21/2024	7:45	SW157+087R-DRIP	McCromneter	Carbon Steel	10	3.88	3.81	-1.8	CS, JG	Pass	√	√	√
							AVERAGE	-1.4		Pass	√	√	√
Total # of tests	15												
Pass	15	100%											
Failed	0	0%											
Average Error, %	-1.4	%											

P:\2024\Water Conservation Plan Update\PT900 Drip flow verifications\PT900 DRIP Tests 2024.xlsx

Date	Time	Velocity	Volumetric	Standard Volumetric	Mass	Batch Forw:	Batch Reve	Batch Net T	Batch Totali	Sound Speed	Amplitude Discret	Amplitude Discret	Gain Up	Gain Down	Signal Dynamic	Signal to Noise Ra	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
4/19/2024	9:09:00	2.6459	2.6786	2.6756	167.0291	0	0	0	0	4887.5737	24.75	24.0625	40.4029	40.4029	0	28.1694	27.8125
4/19/2024	9:09:30	2.6306	2.6631	2.6601	166.0626	0	0	0	0	4887.5664	24.625	24.25	40.4029	40.4029	0	28.1698	27.8871
4/19/2024	9:10:00	2.6092	2.6415	2.6384	164.7124	0	0	0	0	4887.5381	24.4375	24.25	40.4029	40.4029	0	28.1089	27.8964
4/19/2024	9:10:30	2.5906	2.6226	2.6196	163.5353	0	0	0	0	4887.5303	24.6875	24.3125	40.4029	40.4029	0	28.3423	27.942
4/19/2024	9:11:00	2.666	2.699	2.6959	168.2997	0	0	0	0	4887.522	24.75	24.25	40.4029	40.4029	0	28.3317	27.9432
4/19/2024	9:11:30	2.623	2.6554	2.6524	165.5839	0	0	0	0	4887.5513	24.8125	24.25	40.4029	40.4029	0	28.3419	28.024
4/19/2024	9:12:00	2.6351	2.6677	2.6647	166.3504	0	0	0	0	4887.521	24.75	24.1875	40.4029	40.4029	0	28.2957	27.857
4/19/2024	9:12:30	2.5565	2.5881	2.5851	161.3846	0	0	0	0	4887.5566	24.875	24.25	40.4029	40.4029	0	28.2466	28.0047
4/19/2024	9:13:00	2.5949	2.627	2.624	163.8087	0	0	0	0	4887.5342	24.6875	24.1875	40.4029	40.4029	0	28.2116	27.8633
4/19/2024	9:13:30	2.5957	2.6278	2.6248	163.8589	0	0	0	0	4887.5166	24.9375	24.3125	40.4029	40.4029	0	28.4121	28.0412

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

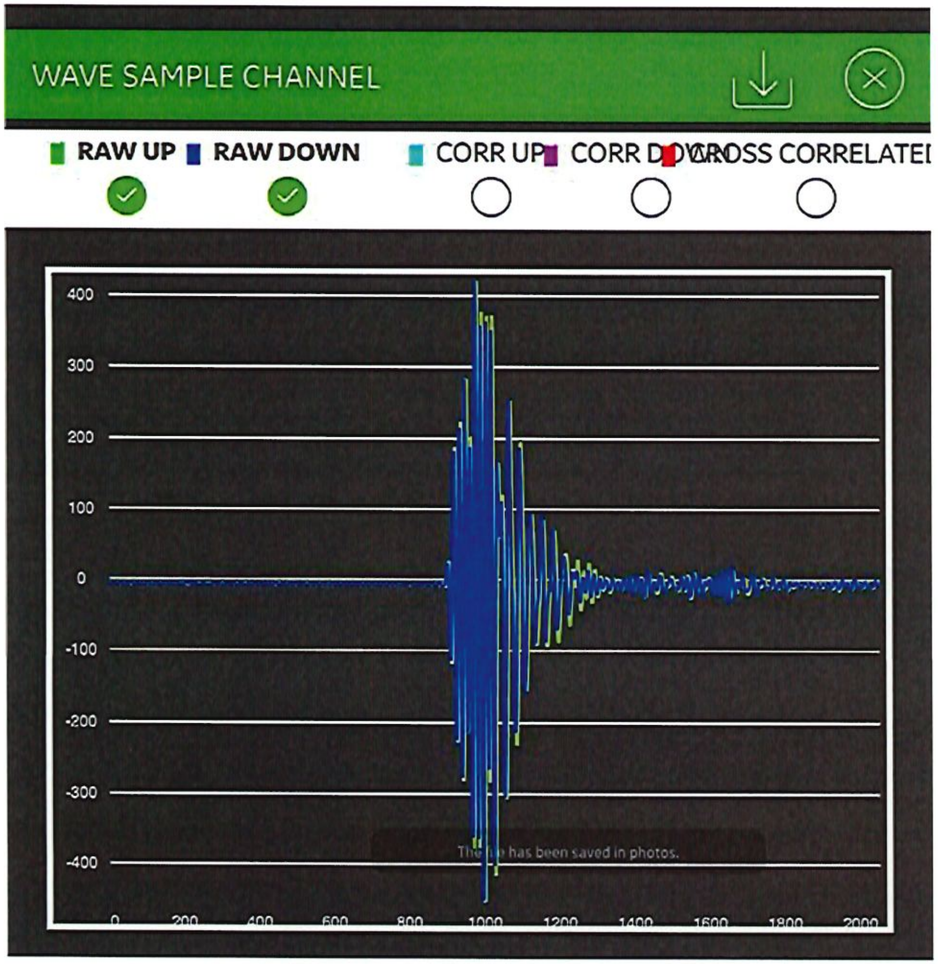
4/19/2024	9:11:15		2.65

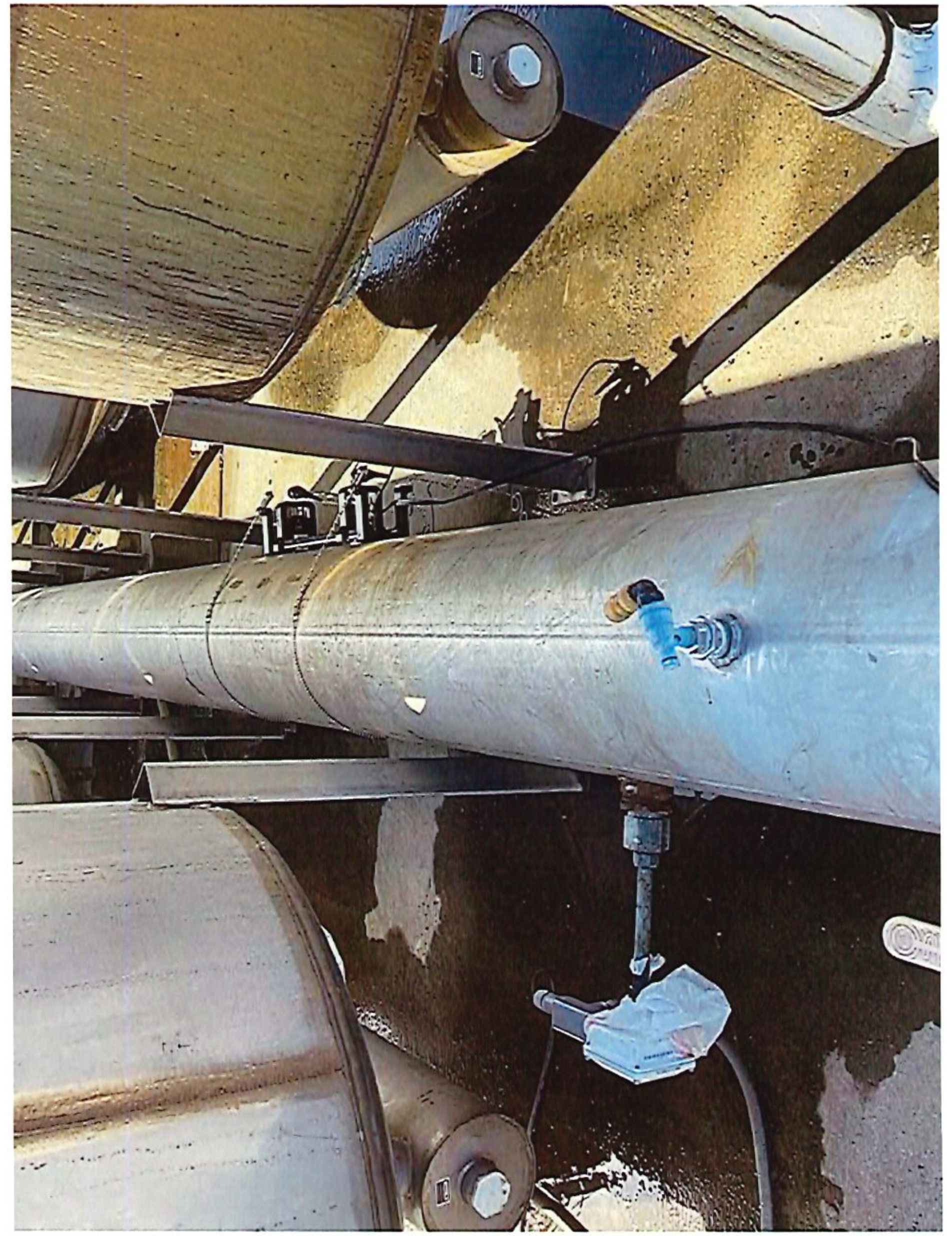
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	1090	
2	1175	
3	1145	
4	1176	**Ave. Installed Device**
5	1175	**ft3/s**
Ave.	**1152**	**2.57**

% Error	Operator Initials	Test Result
-3.0	CS, JG, SG	Pass

AC314+064L-DRIP





Date	Time	Velocity	Volumetric	Standard Volumetric	Mass	Batch Forward	Batch Reverse	Batch Net Tota	Batch Totalizer	Sound Speed	Amplitude Discre	Amplitude Discre	Gain Up	Gain Down	Signal Dynamic	Signal to Noise F	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
4/19/2024	10:13:00	6.4733	1.2987	1.2977	81.0119	0	0	0	0	4865.9863	25.0625	24	47.0139	47.0139	0	26.9963	26.6908
4/19/2024	10:13:30	6.4465	1.2933	1.2923	80.6761	0	0	0	0	4865.9604	25.375	24.25	47.0139	47.0139	0	27.1385	26.8207
4/19/2024	10:14:00	6.4259	1.2892	1.2882	80.4187	0	0	0	0	4866.0107	25.5	24.625	47.0139	47.0139	0	27.1872	26.8936
4/19/2024	10:14:30	6.7149	1.3472	1.3461	84.0349	0	0	0	0	4866.0591	25.9375	24.625	47.0139	47.0139	0	27.3447	26.9057
4/19/2024	10:15:00	8.9899	1.8036	1.8022	112.5056	0	0	0	0	4866.2939	26.4375	24.9375	47.0139	47.0139	0	27.3849	26.971
4/19/2024	10:15:30	6.4966	1.3034	1.3023	81.3023	0	0	0	0	4866.0571	26.125	25.25	47.0139	47.0139	0	27.3033	27.1084
4/19/2024	10:16:00	6.5238	1.3089	1.3078	81.6439	0	0	0	0	4865.9302	26.5625	25.375	47.0139	47.0139	0	27.4988	27.1097
4/19/2024	10:16:30	6.523	1.3087	1.3076	81.6331	0	0	0	0	4865.9731	26.75	25.5	47.0139	47.0139	0	27.4481	27.1479
4/19/2024	10:17:00	6.5023	1.3045	1.3035	81.3745	0	0	0	0	4865.9482	26.8125	25.8125	47.0139	47.0139	0	27.4957	27.2481
4/19/2024	10:17:30	8.0326	1.6116	1.6103	100.526	0	0	0	0	4866.2446	27.375	25.6875	47.0139	47.0139	0	27.6935	27.1898

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

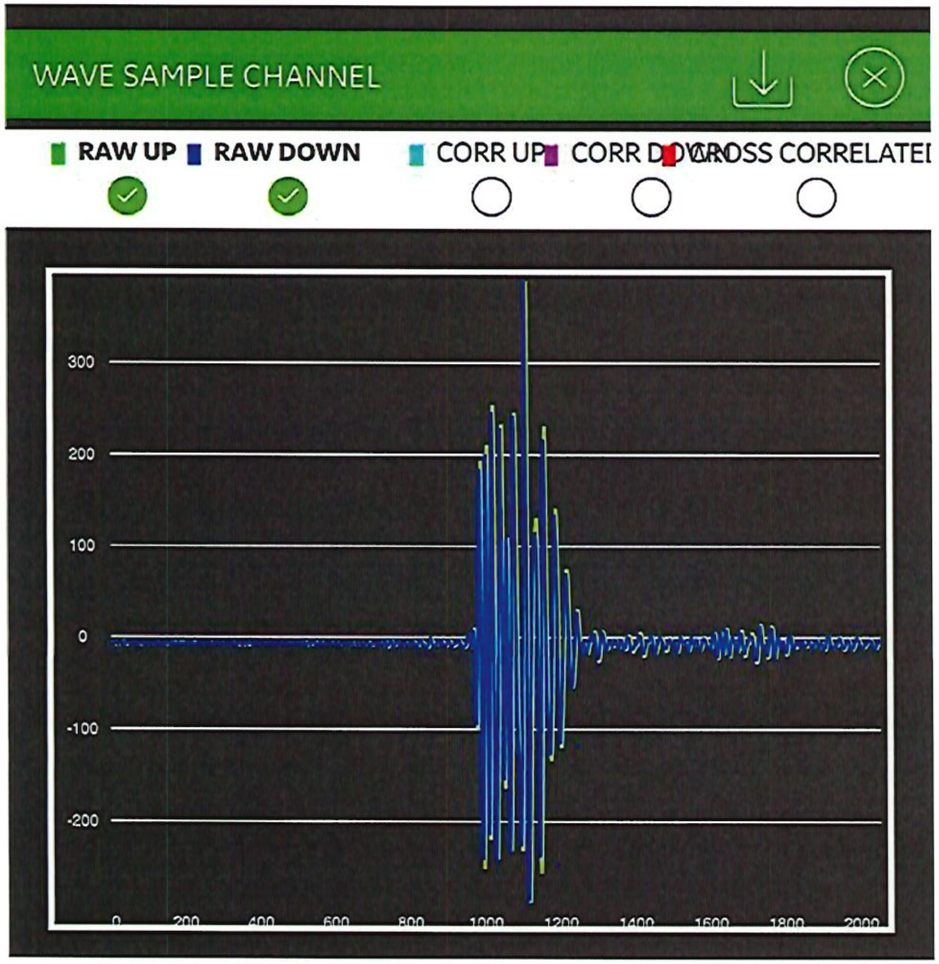
4/19/2024	10:15:15		1.39

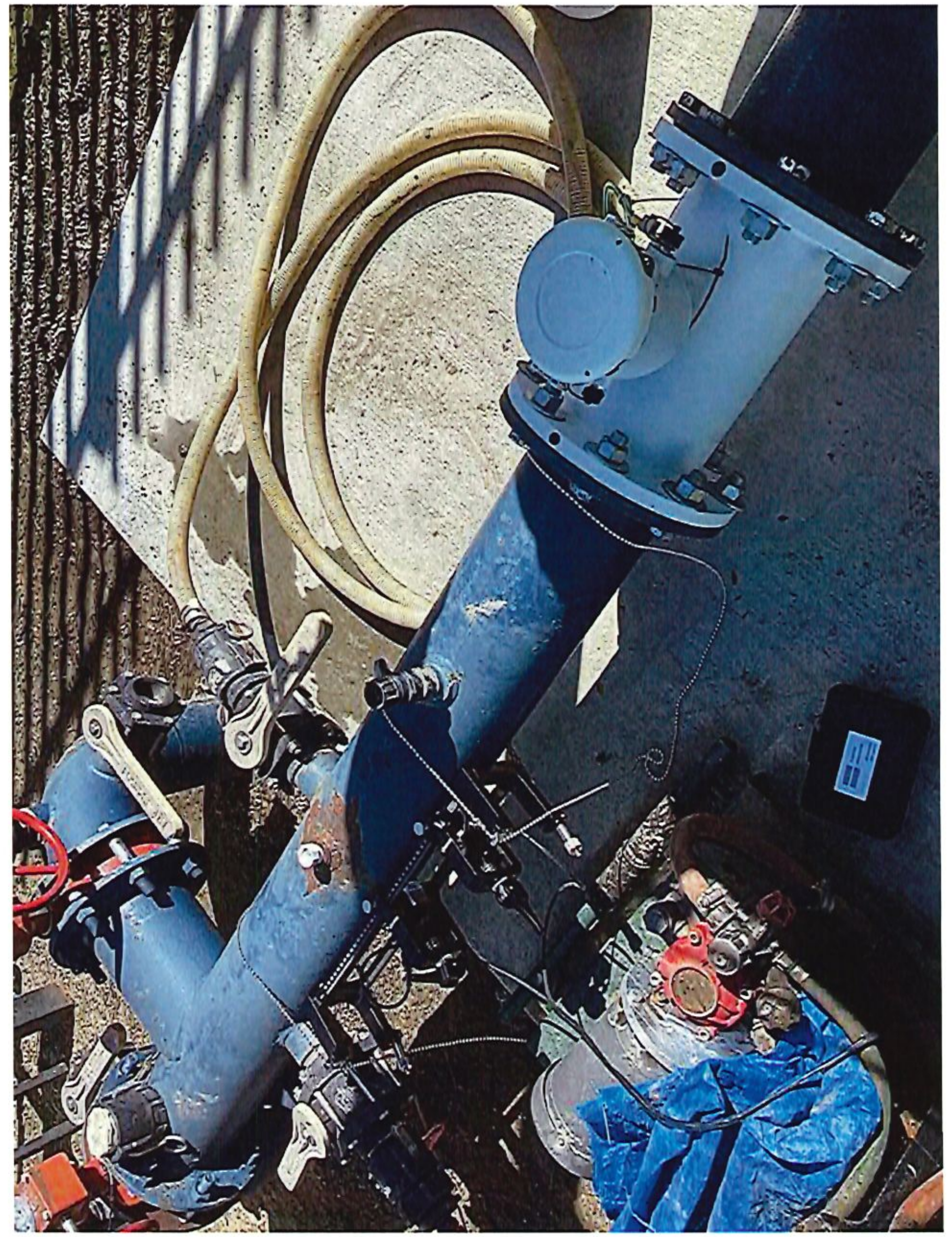
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	580	
2	558	
3	806	
4	585	Ave. Installed Device
5	584	ft3/s
Ave.	623	1.39

% Error	Operator Initials	Test Result
0.0	CS, JG, SG	Pass

AC344+054R-DRIP





Date	Time	Velocity	Volumetric	Standard Volumetric	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spee	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyna	Signal to No	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
5/31/2024	8:35:00	3.4814	2.9376	2.9314	183.0024	0	0	0	0	4661.422	23.1875	23.0625	73.9267	73.9267	0	28.2676	30.0034
5/31/2024	8:35:30	3.4671	2.9255	2.9194	182.2492	0	0	0	0	4661.482	23.1875	23.0625	73.9267	73.9267	0	28.9685	30.0157
5/31/2024	8:36:00	3.4245	2.8895	2.8835	180.0082	0	0	0	0	4661.511	23.1875	23.1875	73.9267	73.9267	0	30.2532	30.0736
5/31/2024	8:36:30	3.4673	2.9256	2.9195	182.2594	0	0	0	0	4661.527	23	23.25	73.9267	73.9267	0	29.4965	30.2341
5/31/2024	8:37:00	3.4398	2.9024	2.8963	180.8121	0	0	0	0	4661.53	23.375	23.25	73.9267	73.9267	0	29.2152	29.9331
5/31/2024	8:37:30	3.4334	2.897	2.8909	180.4751	0	0	0	0	4661.542	23.1875	23.125	73.9267	73.9267	0	29.6755	29.8408
5/31/2024	8:38:00	3.4456	2.9073	2.9013	181.1197	0	0	0	0	4661.556	23.3125	23.125	73.9267	73.9267	0	29.9902	29.489
5/31/2024	8:38:30	3.425	2.89	2.8839	180.0368	0	0	0	0	4661.578	23.25	23.25	73.9267	73.9267	0	29.415	29.6988
5/31/2024	8:39:00	3.4267	2.8913	2.8853	180.1228	0	0	0	0	4661.59	23.1875	23.25	73.9267	73.9267	0	29.9256	29.1183
5/31/2024	8:39:30	3.3781	2.8504	2.8444	177.5705	0	0	0	0	4661.658	23.5	23.125	73.9267	73.9267	0	29.5701	28.8792

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

Date	Time		Volumetric
5/31/2024	8:37:15		2.90

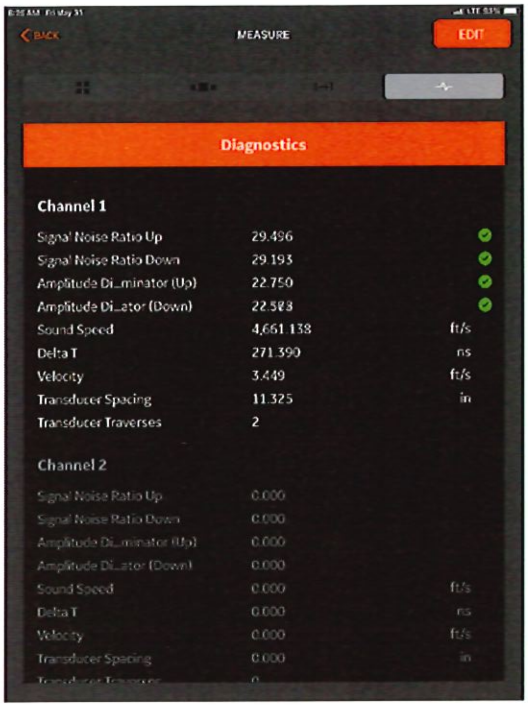
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

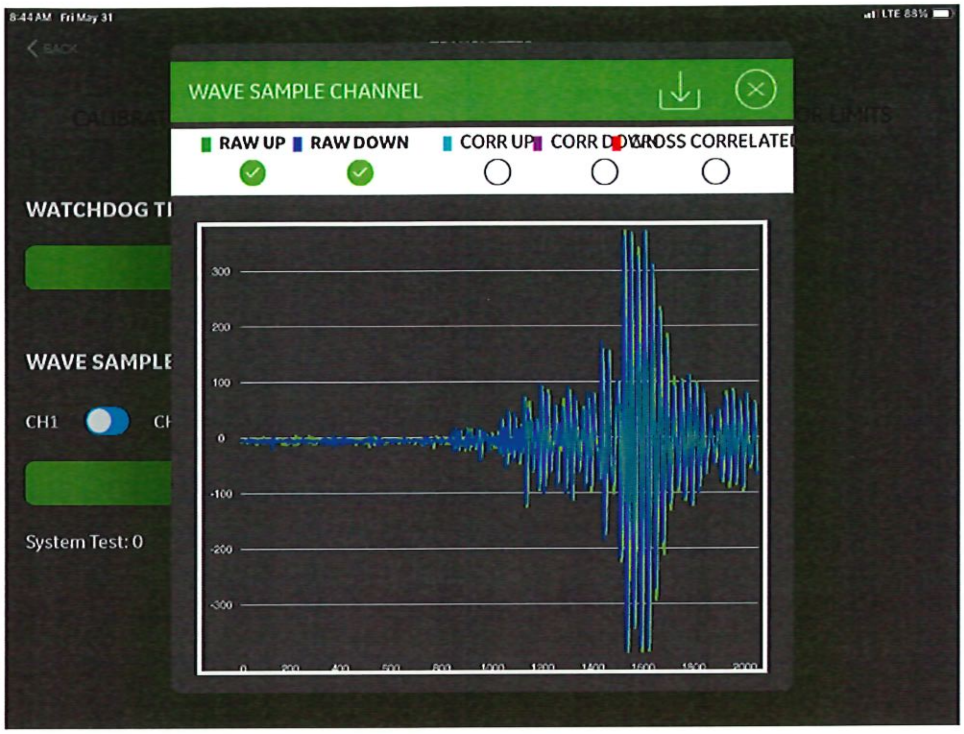
	gpm
1	1300
2	1200
3	1300
4	1300
5	1300
Ave.	1280

Ave. Installed Device
ft3/s
2.85

% Error	Operator Initials	Test Result
-1.7	JG, SG	Pass

D1121+023L-DRIP





Date	Time	Velocity	Volumetric	Standard Vo	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spe	Amplitude	Amplitude	Gain Up	Gain Down	Signal Dyna	Signal to N	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
4/26/2024	12:00:00	4.3759	3.6639	3.6609	228.5449	0	0	0	0	4854.228	26.9375	27.25	38.7853	38.7853	0	29.3028	29.0948
4/26/2024	12:00:30	4.3659	3.6554	3.6525	228.0192	0	0	0	0	4854.307	27.25	27.3125	38.7853	38.7853	0	29.3272	29.067
4/26/2024	12:01:00	4.4514	3.727	3.7241	232.4856	0	0	0	0	4854.338	27.125	27.3125	38.7853	38.7853	0	29.271	29.0754
4/26/2024	12:01:30	4.3725	3.661	3.6581	228.3681	0	0	0	0	4854.354	27.25	27.25	38.7853	38.7853	0	29.2587	29.1088
4/26/2024	12:02:00	4.3891	3.6749	3.6719	229.2304	0	0	0	0	4854.3	27.375	27.4375	38.7853	38.7853	0	29.2506	29.1658
4/26/2024	12:02:30	4.397	3.6815	3.6786	229.6447	0	0	0	0	4854.245	27.3125	27.3125	38.7853	38.7853	0	29.3395	29.1045
4/26/2024	12:03:00	4.4199	3.7007	3.6977	230.839	0	0	0	0	4854.307	27.4375	27.375	38.7853	38.7853	0	29.298	29.1104
4/26/2024	12:03:30	4.3662	3.6557	3.6528	228.0344	0	0	0	0	4854.209	27.375	27.4375	38.7853	38.7853	0	29.3973	29.097
4/26/2024	12:04:00	4.353	3.6446	3.6417	227.3456	0	0	0	0	4854.339	27.625	27.4375	38.7853	38.7853	0	29.454	29.1537
4/26/2024	12:04:30	4.3611	3.6514	3.6485	227.768	0	0	0	0	4854.413	27.5	27.4375	38.7853	38.7853	0	29.3722	29.1468

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

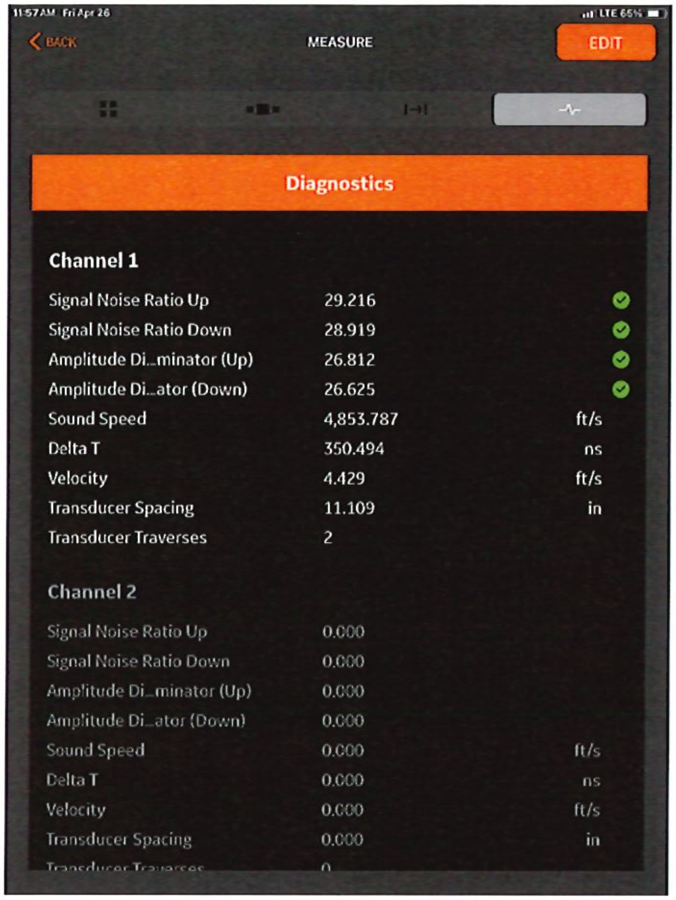
Date	Time		Volumetric
4/26/2024	12:02:00		3.67

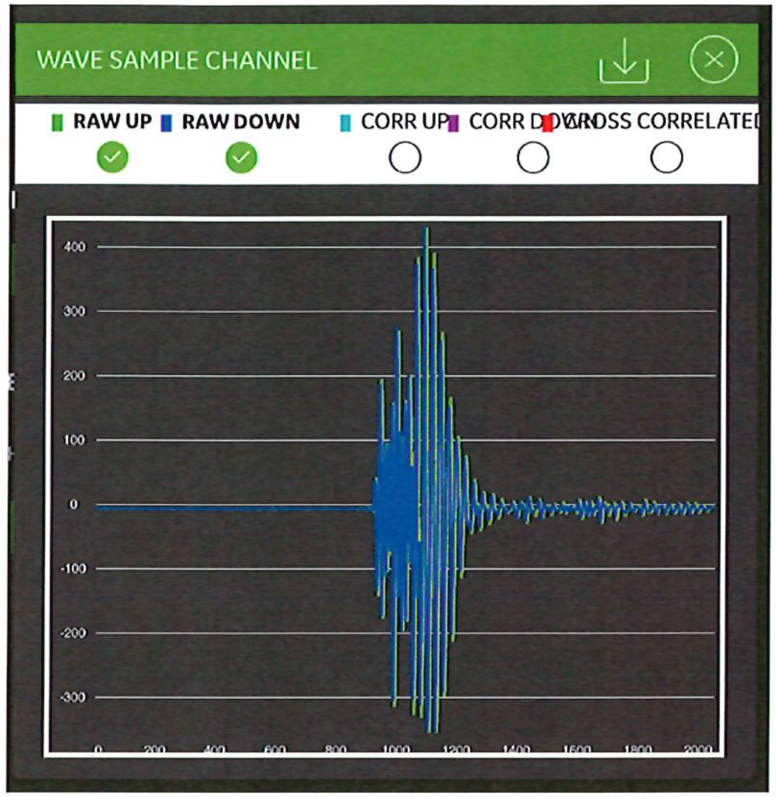
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	1583	
2	1590	
3	1587	
4	1594	Ave. Installed Device
5	1569	ft3/s
Ave.	1584.6	3.53

% Error	Operator Initials	Test Result
-3.9	CS, JG, SG	Pass

DE337+038L-DRIP





Date	Time	Velocity	Volumetric	Standard V	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spe	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyna	Signal to N	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
5/31/2024	9:54:00	6.5349	3.7447	3.734	233.1039	0	0	0	0	4768.683	21.75	21.9375	85.8828	85.8828	0	26.1338	24.8414
5/31/2024	9:54:30	6.548	3.7522	3.7415	233.5713	0	0	0	0	4768.804	21.8125	22.125	85.8828	85.8828	0	25.1897	25.5902
5/31/2024	9:55:00	6.5341	3.7442	3.7335	233.0761	0	0	0	0	4768.923	21.5	22.1875	85.8828	85.8828	0	26.4209	24.7788
5/31/2024	9:55:30	6.5714	3.7656	3.7548	234.405	0	0	0	0	4768.941	21.625	21.8125	85.8828	85.8828	0	25.8428	24.5793
5/31/2024	9:56:00	6.5264	3.7398	3.7291	232.7991	0	0	0	0	4769.013	21.25	21.75	85.8828	85.8828	0	26.1897	24.529
5/31/2024	9:56:30	6.5169	3.7343	3.7237	232.4603	0	0	0	0	4769.099	21.375	21.8125	85.8828	85.8828	0	26.5654	25.1109
5/31/2024	9:57:00	6.5294	3.7415	3.7308	232.9066	0	0	0	0	4769.114	21.3125	21	85.8828	85.8828	0	26.0477	25.5454
5/31/2024	9:57:30	6.5006	3.725	3.7144	231.8801	0	0	0	0	4769.156	21.5	21.5	85.8828	85.8828	0	25.9482	25.202

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

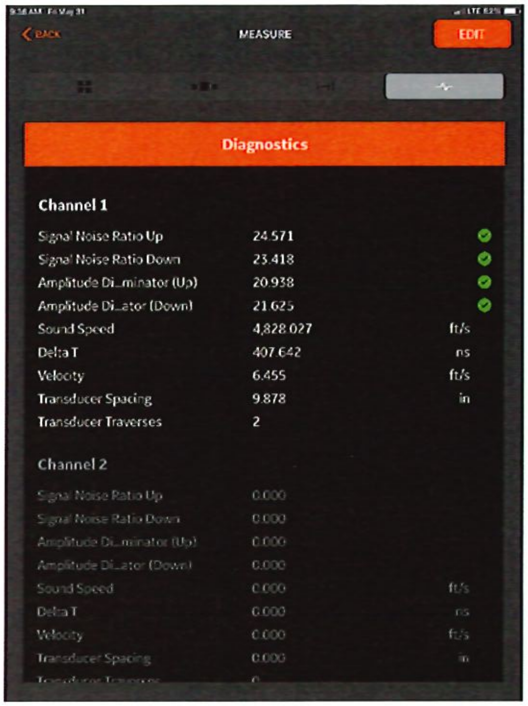
5/31/2024	9:55:45		3.74

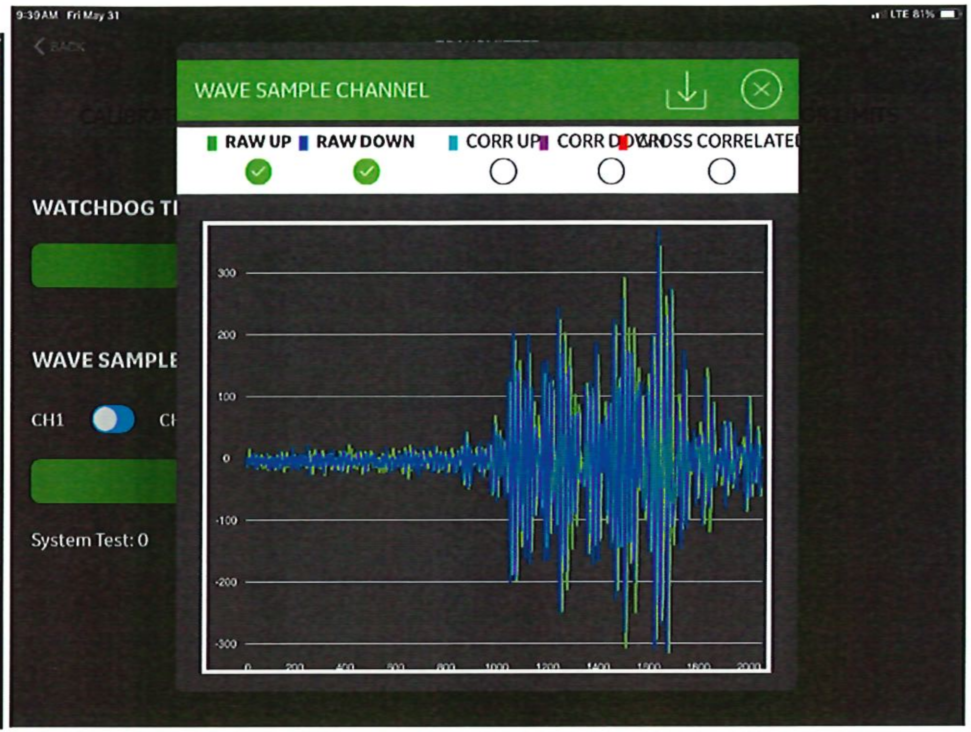
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	1600	
2	1700	
3	1600	
4	1600	Ave. Installed Device
5	1700	ft3/s
Ave.	1640	3.65

% Error	Operator Initials	Test Result
-2.4	JG, SG	Pass

DU038+040L-DRIP



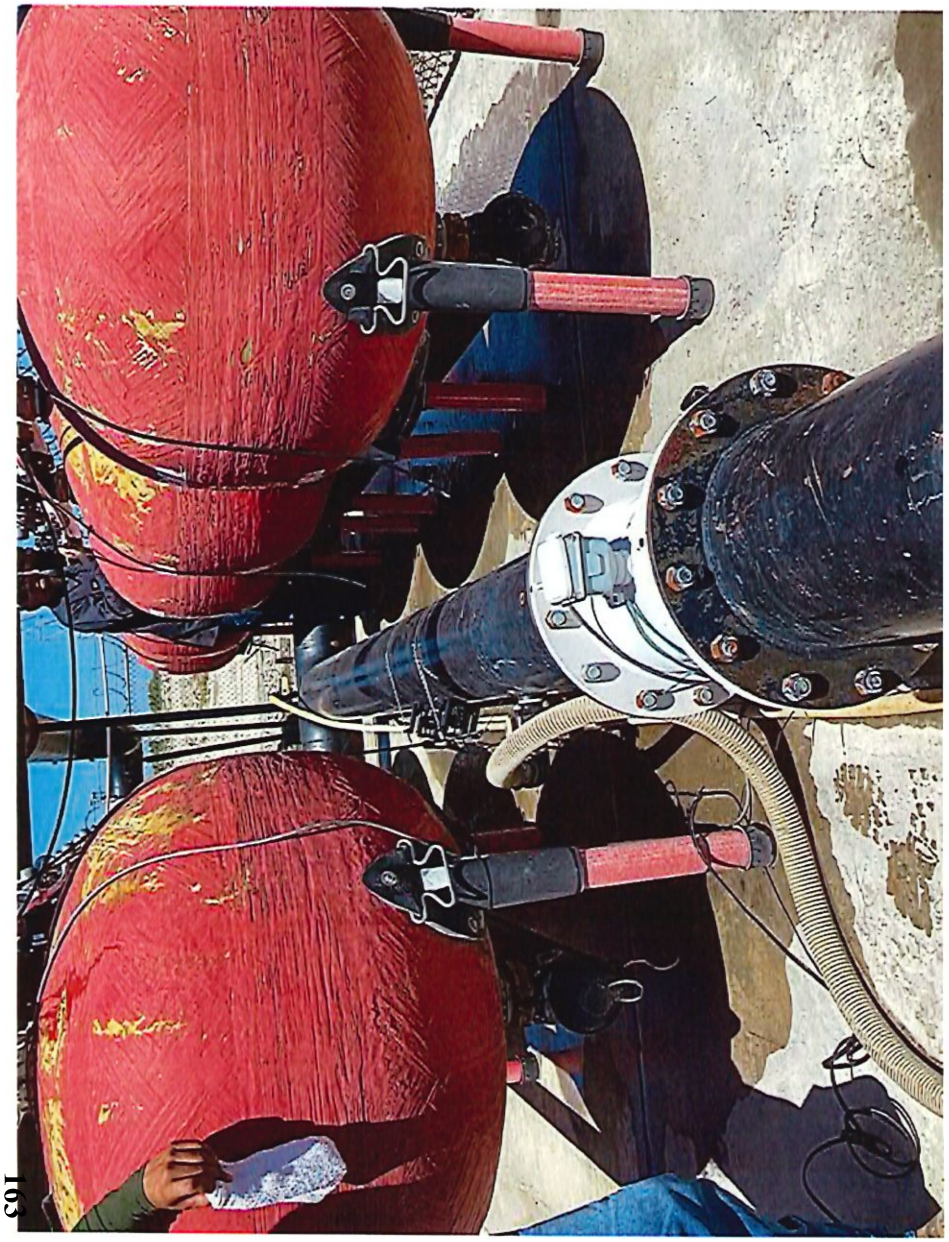


Date	Time	Velocity	Volumetric	Standard Volume	Mass	Batch Forward T	Batch Reverse T	Batch Net Totali	Batch Totalizer 1	Sound Speed	Amplitude Discr	Amplitude Discr	Gain Up	Gain Down	Signal Dynamic	Signal to Noise Ratio U	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
4/19/2024	13:13:00	4.6685	3.6289	3.626	226.3608	0	0	0	0	4775.1753	26.6875	26.3125	66.9641	66.9641	0	31.5964	31.3009
4/19/2024	13:13:30	4.7673	3.7056	3.7027	231.1496	0	0	0	0	4775.1797	26.9375	26.5625	66.9641	66.9641	0	31.706	31.2555
4/19/2024	13:14:00	4.7255	3.6732	3.6702	229.1246	0	0	0	0	4775.2461	27.125	26.6875	66.9641	66.9641	0	31.6099	31.4771
4/19/2024	13:14:30	4.828	3.7528	3.7498	234.0919	0	0	0	0	4775.4155	27.4375	26.875	66.9641	66.9641	0	31.8344	31.4705
4/19/2024	13:15:00	4.7393	3.6839	3.6809	229.7917	0	0	0	0	4775.3882	27.5	27.125	66.9641	66.9641	0	31.9492	31.5138
4/19/2024	13:15:30	4.7225	3.6708	3.6679	228.9792	0	0	0	0	4775.4512	27.9375	27.375	66.9641	66.9641	0	31.9534	31.6719
4/19/2024	13:16:00	4.7028	3.6555	3.6526	228.0238	0	0	0	0	4775.5654	27.875	27.4375	66.9641	66.9641	0	31.9786	31.5712
4/19/2024	13:16:30	4.6443	3.61	3.6071	225.187	0	0	0	0	4775.6201	28.125	27.8125	66.9641	66.9641	0	32.0358	31.7888
4/19/2024	13:17:00	4.7245	3.6724	3.6694	229.0741	0	0	0	0	4775.6553	28.375	27.9375	66.9641	66.9641	0	32.099	31.7906
4/19/2024	13:17:30	4.7998	3.7309	3.7279	232.7275	0	0	0	0	4775.7666	28.5	28.125	66.9641	66.9641	0	32.2351	31.789
Congrats! Channel 1 Linear END!																	
Average of the PT 900 Log readings																	
4/19/2024	13:15:15		3.68														

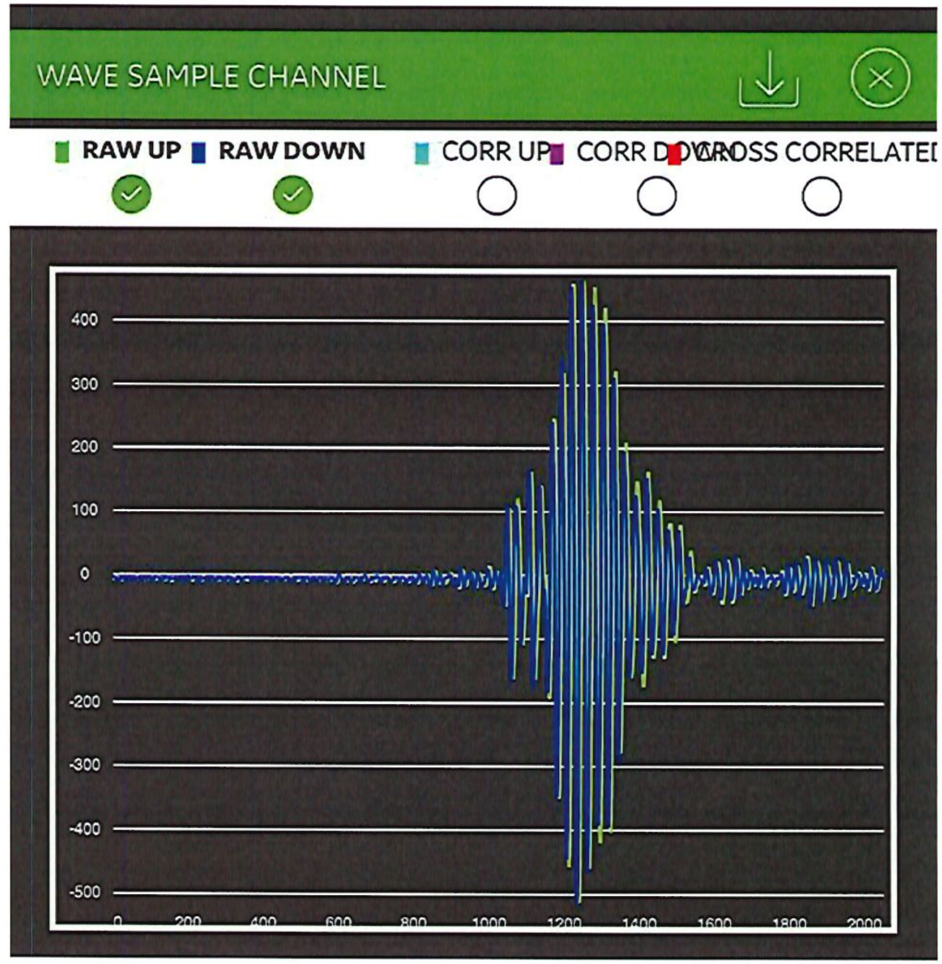
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	1488	
2	1495	
3	1520	
4	1485	Ave. Installed Device
5	1485	ft3/s
Ave.	1495	3.33

% Error	Operator Initials	Test Result
-9.5	CS, JG, SG	Pass



ID111+011L-DRIP



Date	Time	Velocity	Volumetric	Standard V	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spe	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyna	Signal to N	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
6/7/2024	11:51:00	8.1887	2.9484	2.9351	183.2292	0	0	0	0	4587.624	22.1875	21.9375	58.5714	58.5714	0	28.1345	27.7568
6/7/2024	11:51:30	8.1002	2.9166	2.9033	181.2489	0	0	0	0	4587.697	22.25	21.875	58.5714	58.5714	0	27.9238	27.755
6/7/2024	11:52:00	8.1251	2.9255	2.9122	181.8049	0	0	0	0	4587.632	22.3125	21.875	58.5714	58.5714	0	28.1119	27.7668
6/7/2024	11:52:30	8.1597	2.938	2.9246	182.5797	0	0	0	0	4587.731	22.1875	22	58.5714	58.5714	0	27.9946	27.9268
6/7/2024	11:53:00	8.1367	2.9297	2.9164	182.0653	0	0	0	0	4587.786	22.1875	21.9375	58.5714	58.5714	0	28.049	27.8527
6/7/2024	11:53:30	8.1084	2.9195	2.9063	181.4335	0	0	0	0	4587.574	22.25	21.875	58.5714	58.5714	0	28.0902	27.9048
6/7/2024	11:54:00	8.2473	2.9695	2.956	184.5402	0	0	0	0	4587.69	22.1875	21.8125	58.5714	58.5714	0	28.0853	27.9015
6/7/2024	11:54:30	8.2832	2.9825	2.9689	185.3442	0	0	0	0	4587.708	22.0625	21.75	58.5714	58.5714	0	27.966	27.722

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

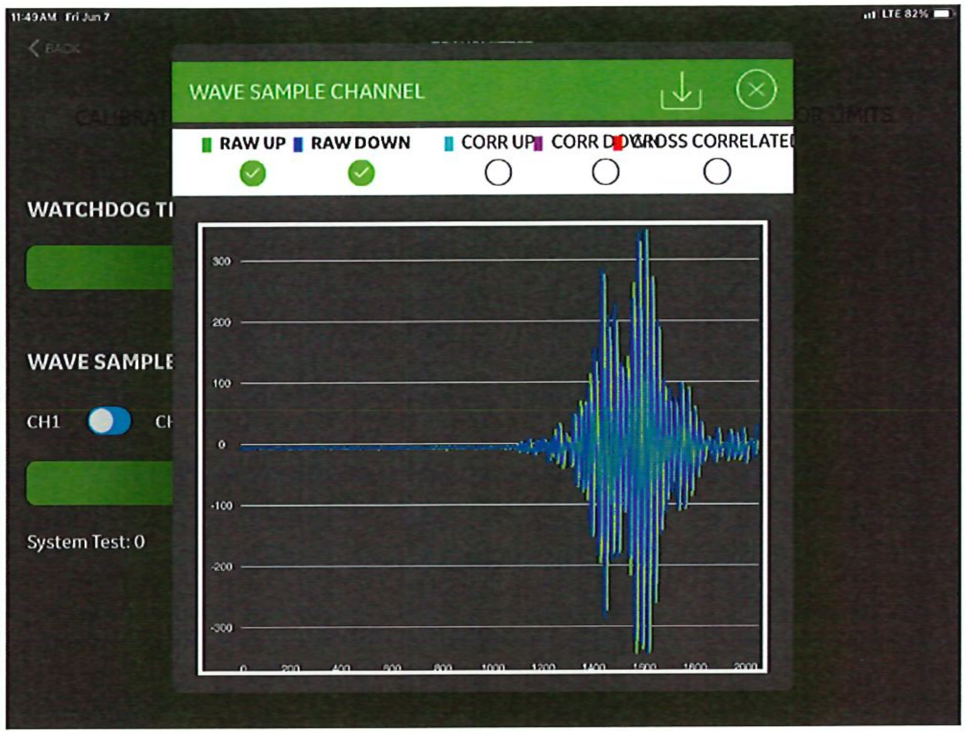
6/7/2024	11:52:45		2.94

5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	1300	
2	1300	
3	1300	
4	1300	Ave. Installed Device
5	1290	ft3/s
Ave.	1298	2.89

% Error	Operator Initials	Test Result
-1.7	JG, SG	Pass

MI099+094L-DRIP



Date	Time	Velocity	Volumetric	Standard V	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spe	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyna	Signal to N	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
6/7/2024	13:41:00	3.3128	2.7952	2.7848	173.8505	0	0	0	0	4930.105	24.125	24.875	60.4703	60.4703	0	30.1731	30.294
6/7/2024	13:41:30	3.349	2.8258	2.8153	175.753	0	0	0	0	4930.13	24.1875	24.6875	60.4703	60.4703	0	30.4775	30.4286
6/7/2024	13:42:00	3.3425	2.8203	2.8098	175.4081	0	0	0	0	4930.125	24.1875	24.625	60.4703	60.4703	0	30.3188	30.4369
6/7/2024	13:42:30	3.3782	2.8504	2.8398	177.283	0	0	0	0	4930.205	24.125	24.75	60.4703	60.4703	0	30.2294	29.7924
6/7/2024	13:43:00	3.3136	2.7959	2.7855	173.8937	0	0	0	0	4930.199	24.4375	24.875	60.4703	60.4703	0	30.4814	29.9326
6/7/2024	13:43:30	3.292	2.7777	2.7674	172.7608	0	0	0	0	4930.169	24.125	24.8125	60.4703	60.4703	0	30.5625	30.3921
6/7/2024	13:44:00	3.3614	2.8363	2.8257	176.4016	0	0	0	0	4930.908	24.8125	24.8125	60.4703	60.4703	0	30.0901	30.176
6/7/2024	13:44:30	3.3516	2.828	2.8175	175.8905	0	0	0	0	4930.913	24	24.25	60.4703	60.4703	0	30.2453	30.2676
6/7/2024	13:45:00	3.3551	2.8309	2.8204	176.0692	0	0	0	0	4930.932	24	24.625	60.4703	60.4703	0	30.1787	30.1019
6/7/2024	13:45:30	3.3701	2.8436	2.833	176.8606	0	0	0	0	4930.89	24.5	25.125	60.4703	60.4703	0	30.3813	30.5151

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

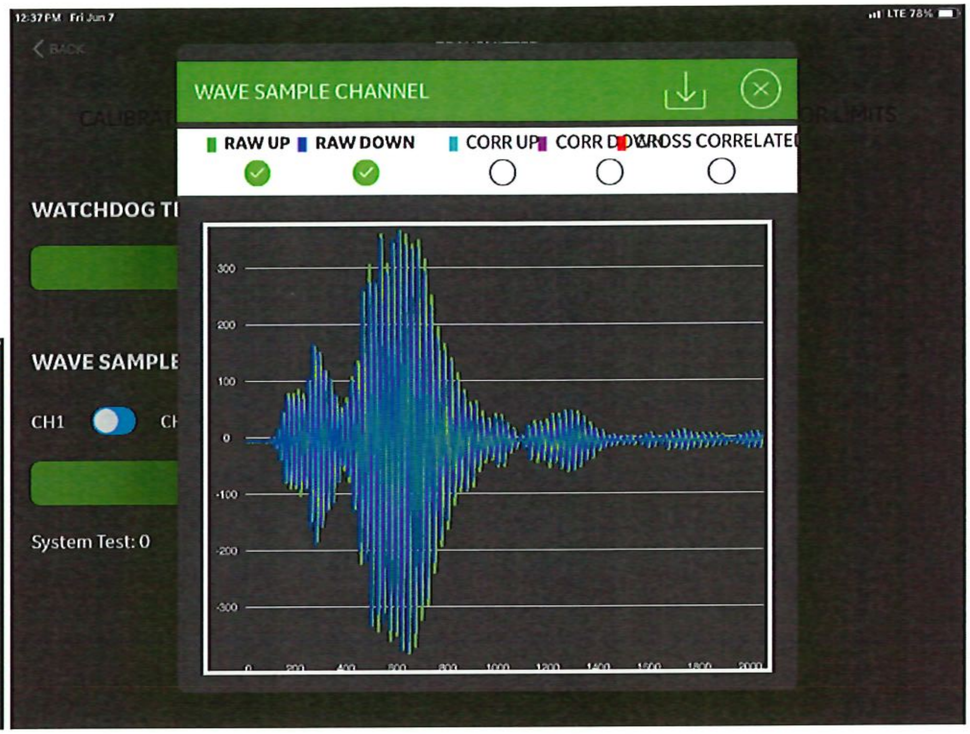
Date	Time		Volumetric
6/7/2024	13:43:15		2.82

5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	1300	
2	1290	
3	1290	
4	1290	**Ave. Installed Device**
5	1290	**ft3/s**
Ave.	**1292**	**2.88**

% Error	Operator Initials	Test Result
2.1	JG, SG	Pass


MEASURE
EDIT
Diagnostics
Channel 1
Signal Noise Ratio Up 29.719
Signal Noise Ratio Down 29.482
Amplitude Discriminator (Up) 23.128
Amplitude D...ator (Down) 21.625
Sound Speed 4,929.167 ft/s
Delta T 260.464 ns
Velocity 3.387 ft/s
Transducer Spacing 11.422 in
Transducer Traverses 2
Channel 2


12:37 PM Fri Jun 7
LTE 78%
WAVE SAMPLE CHANNEL
RAW UP
RAW DOWN
CORR UP
CORR DOWN
CROSS CORRELATED
WATCHDOG TI
WAVE SAMPLE
CH1
System Test: 0
300
200
100
0
-100
-200
-300

Date	Time	Velocity	Volumetric	Standard Vo	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spee	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyna	Signal to No	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
4/26/2024	9:01:00	5.9776	5.9419	5.9339	370.4439	0	0	0	0	4883.283	28.5625	26.875	76.7634	76.7634	0	19.1683	17.8098
4/26/2024	9:01:30	5.9557	5.9201	5.9122	369.085	0	0	0	0	4883.236	28.6875	26.75	76.7634	76.7634	0	19.2869	18.2182
4/26/2024	9:02:00	5.9459	5.9103	5.9025	368.4781	0	0	0	0	4883.272	28.625	26.875	76.7634	76.7634	0	19.2704	18.0029
4/26/2024	9:02:30	5.9293	5.8938	5.8859	367.4475	0	0	0	0	4883.3	28.375	26.75	76.7634	76.7634	0	19.6072	17.8846
4/26/2024	9:03:00	5.9324	5.897	5.8891	367.6447	0	0	0	0	4883.237	28.75	26.6875	76.7634	76.7634	0	20.0903	18.2919
4/26/2024	9:03:30	5.9355	5.9	5.8921	367.8324	0	0	0	0	4883.193	29.1875	26.8125	76.7634	76.7634	0	20.0849	18.2528
4/26/2024	9:04:00	5.9543	5.9187	5.9108	369.0002	0	0	0	0	4883.303	29.3125	26.875	76.7634	76.7634	0	20.6211	18.4479
4/26/2024	9:04:30	5.9764	5.9406	5.9327	370.3662	0	0	0	0	4883.268	28.6875	26.6875	76.7634	76.7634	0	21.0113	18.3637
4/26/2024	9:05:00	5.9322	5.8967	5.8889	367.6299	0	0	0	0	4883.31	0	0	0	0	0	21.1604	18.2999
4/26/2024	9:05:30	5.8896	5.8544	5.8466	364.9912	0	0	0	0	4883.258	24.0625	22.1875	75.4037	75.4037	0	20.8996	17.9943

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

Date	Time	Velocity	Volumetric
4/26/2024	9:03:00		5.91

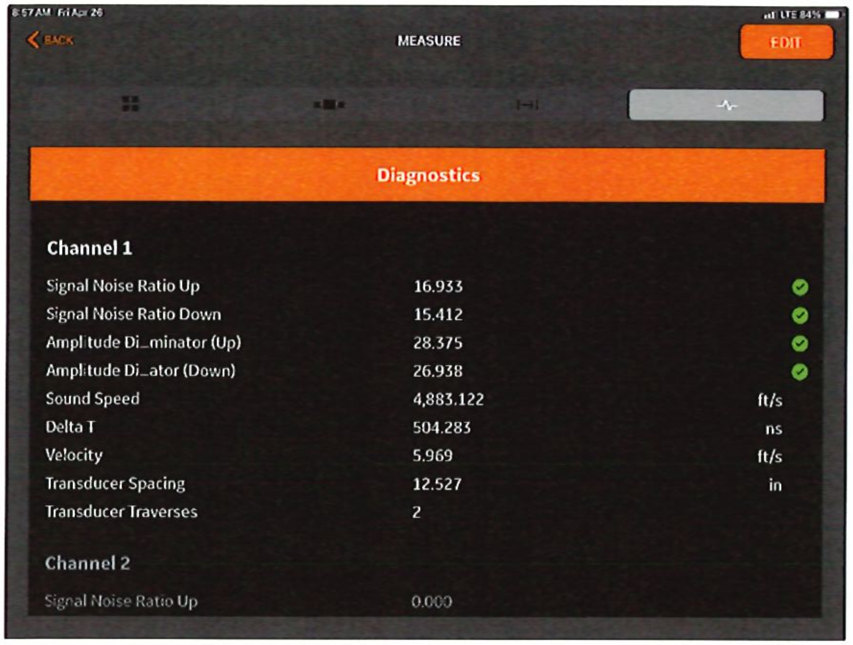
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

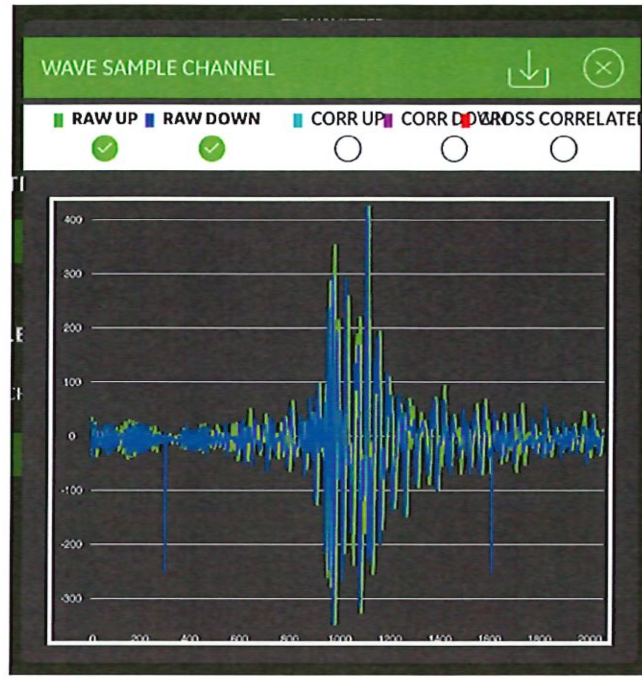
	gpm
1	2600
2	2700
3	2700
4	2600
5	2600
Ave.	2640

Ave. Installed Device
ft3/s
5.88

% Error	Operator Initials	Test Result
-0.5	CS, JG, SG	Pass

SJ154+014L-DRIP





Date	Time	Velocity	Volumetric	Standard V	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spe	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyn	Signal to N	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
6/21/2024	6:18:00	3.6734	2.2013	2.1981	137.2204	0	0	0	0	4814.982	23.125	22.8125	44.0366	44.0366	0	28.2577	28.3802
6/21/2024	6:18:30	3.579	2.1448	2.1416	133.6937	0	0	0	0	4815.05	22.6875	22.6875	44.0366	44.0366	0	28.1884	28.432
6/21/2024	6:19:00	3.6244	2.1719	2.1687	135.3889	0	0	0	0	4814.94	22.875	22.4375	44.0366	44.0366	0	28.0984	28.198
6/21/2024	6:19:30	3.8013	2.278	2.2746	141.9975	0	0	0	0	4814.973	22.8125	22.5	44.0366	44.0366	0	28.0903	28.2713
6/21/2024	6:20:00	3.4934	2.0935	2.0903	130.496	0	0	0	0	4814.931	22.625	22.125	44.0366	44.0366	0	28.0335	28.1427
6/21/2024	6:20:30	3.628	2.1741	2.1709	135.5254	0	0	0	0	4814.779	22.6875	22.0625	44.0366	44.0366	0	27.9813	28.1811
6/21/2024	6:21:00	3.6447	2.1841	2.1809	136.1489	0	0	0	0	4814.848	22.4375	21.9375	44.0366	44.0366	0	28.0649	28.0644
6/21/2024	6:21:30	3.5829	2.1471	2.1439	133.8386	0	0	0	0	4814.868	22.3125	21.875	44.0366	44.0366	0	27.8099	27.9752
6/21/2024	6:22:00	3.9493	2.3666	2.3631	147.5252	0	0	0	0	4814.946	22.375	21.875	44.0366	44.0366	0	27.8823	27.9141
6/21/2024	6:22:30	3.6238	2.1716	2.1684	135.3665	0	0	0	0	4814.757	22.25	21.5625	44.0366	44.0366	0	27.7912	27.952
6/21/2024	6:23:00	3.7754	2.2624	2.2591	141.0289	0	0	0	0	4814.903	22.125	21.6875	44.0366	44.0366	0	27.6964	27.8768
6/21/2024	6:23:30	3.6255	2.1726	2.1694	135.4325	0	0	0	0	4814.798	21.8125	21.75	44.0366	44.0366	0	27.5623	27.9202

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

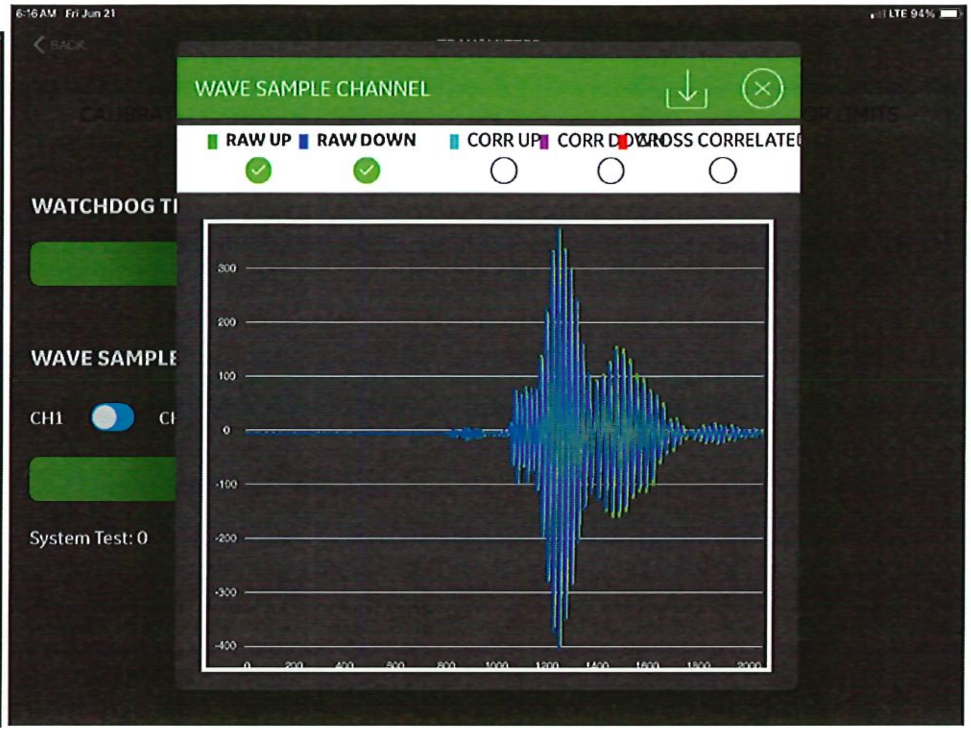
6/21/2024	6:20:45		2.20

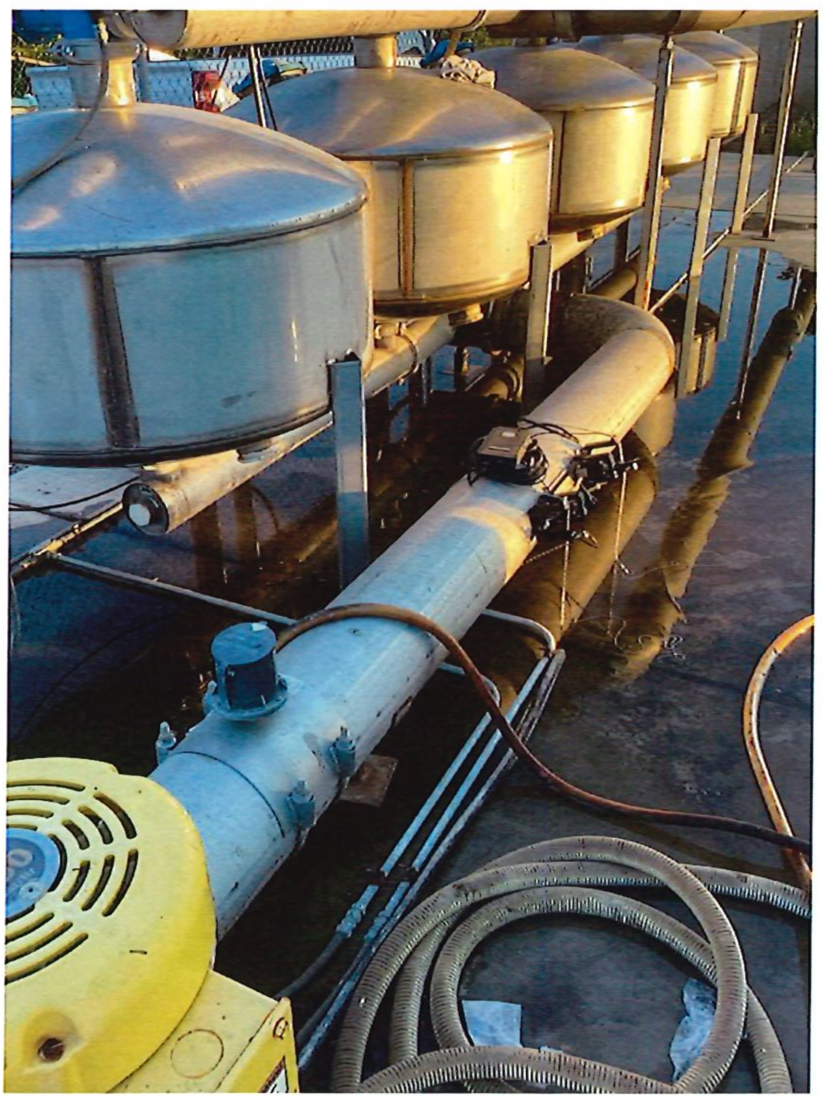
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	950	
2	960	
3	1000	
4	960	Ave. Installed Device
5	970	ft3/s
Ave.	968	2.16

% Error	Operator Initials	Test Result
-1.8	CA, JG	Pass

SJ215+078L-DRIP





Date	Time	Velocity	Volumetric	Standard Volun	Mass	Batch Forward ˉ	Batch Reverse 1	Batch Net Total	Batch Totalizer ˉ	Sound Speed	Amplitude Disc	Amplitude Disc	Gain Up	Gain Down	Signal Dynamic	Signal to Noise	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
4/12/2024	13:36:59	7.1523	5.9885	5.9884	373.8452	0	0	0	0	4901.6787	23.375	22.4375	35.8549	35.8549	0	29.1265	28.4307
4/12/2024	13:37:29	7.1817	6.0131	6.013	375.3816	0	0	0	0	4901.6528	23.3125	22.5625	35.8549	35.8549	0	29.1266	28.4508
4/12/2024	13:37:59	7.2157	6.0415	6.0415	377.1576	0	0	0	0	4901.6973	23.4375	22.5625	35.8549	35.8549	0	29.1632	28.4182
4/12/2024	13:38:29	7.7168	6.4611	6.4611	403.3506	0	0	0	0	4901.793	23.4375	22.6875	35.8549	35.8549	0	29.2052	28.5039
4/12/2024	13:38:59	7.0785	5.9267	5.9267	369.9891	0	0	0	0	4901.7583	23.375	22.75	35.8549	35.8549	0	29.2049	28.5866
4/12/2024	13:39:29	7.1692	6.0026	6.0026	374.7306	0	0	0	0	4901.7554	23.375	22.625	35.8549	35.8549	0	29.2203	28.4277
4/12/2024	13:39:59	7.2552	6.0746	6.0746	379.2227	0	0	0	0	4901.7686	23.4375	22.75	35.8549	35.8549	0	29.2664	28.6181
4/12/2024	13:40:29	7.206	6.0335	6.0334	376.6539	0	0	0	0	4901.8872	23.25	22.75	35.8549	35.8549	0	29.2124	28.519
4/12/2024	13:40:59	7.8803	6.598	6.5979	411.8955	0	0	0	0	4901.9458	23.5625	22.5625	35.8549	35.8549	0	29.299	28.4287
4/12/2024	13:41:29	7.1077	5.9512	5.9511	371.5167	0	0	0	0	4901.9214	23.375	22.75	35.8549	35.8549	0	29.1547	28.5374

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

4/12/2024	13:39:14		6.11

5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	2950	
2	2700	
3	2650	
4	2704	Ave. Installed Device
5	2680	ft3/s
Ave.	2737	6.10

% Error	Operator Initials	Test Result
-0.2	CS, JG, SG, RM, et al.	Pass

Date	Time	Velocity	Volumetric	Standard Vo	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spe	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyn	Signal to N	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
6/21/2024	7:57:00	6.7971	3.8949	3.8863	242.6121	0	0	0	0	4760.93	26.25	26.1875	74.4894	74.4894	0	24.2086	23.3192
6/21/2024	8:02:46	6.5559	3.7567	3.7484	234.0027	0	0	0	0	4760.716	26.4375	26.0625	74.4894	74.4894	0	25.2868	23.8343
6/21/2024	8:02:47	6.5834	3.7725	3.7641	234.9876	0	0	0	0	4760.855	26.0625	26.75	74.4894	74.4894	0	23.7975	22.7773
6/21/2024	8:02:48	6.6044	3.7845	3.7761	235.7341	0	0	0	0	4749.932	25.4375	26.25	74.4894	74.4894	0	24.5602	23.2253
6/21/2024	8:02:49	6.6462	3.8084	3.8	237.2268	0	0	0	0	4760.792	26	26.75	74.4894	74.4894	0	25.2023	23.7858
6/21/2024	8:02:50	6.6702	3.8222	3.8138	238.0848	0	0	0	0	4760.834	26.0625	27.25	74.4894	74.4894	0	24.2366	22.8728
6/21/2024	8:02:51	6.6917	3.8345	3.8261	238.8528	0	0	0	0	4749.716	26.375	26.5625	74.4894	74.4894	0	25.4792	23.6262
6/21/2024	8:02:52	6.7129	3.8466	3.8381	239.6068	0	0	0	0	4760.72	26.0625	26.5625	74.4894	74.4894	0	24.4944	23.3942
6/21/2024	8:02:53	6.7057	3.8425	3.834	239.3501	0	0	0	0	4760.79	26.125	26.25	74.4894	74.4894	0	24.7552	23.2075
6/21/2024	8:02:54	6.726	3.8542	3.8456	240.075	0	0	0	0	4760.763	25.5	26.875	74.4894	74.4894	0	25.0016	23.6774
6/21/2024	8:02:55	6.7252	3.8537	3.8452	240.0474	0	0	0	0	4760.854	25.875	26.75	74.4894	74.4894	0	24.8907	22.4455
6/21/2024	8:02:56	6.7429	3.8638	3.8553	240.6781	0	0	0	0	4760.729	25.75	26.5	74.4894	74.4894	0	24.4061	22.4699
6/21/2024	8:02:57	6.7459	3.8656	3.857	240.7855	0	0	0	0	4749.744	25.5	26.3125	74.4894	74.4894	0	24.6722	22.2626
6/21/2024	8:02:58	6.7376	3.8608	3.8523	240.4887	0	0	0	0	4749.894	26.125	26.5	74.4894	74.4894	0	24.6931	22.3447
6/21/2024	8:02:59	6.74	3.8622	3.8536	240.574	0	0	0	0	4760.752	26.625	26.4375	74.4894	74.4894	0	23.9874	23.8223

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

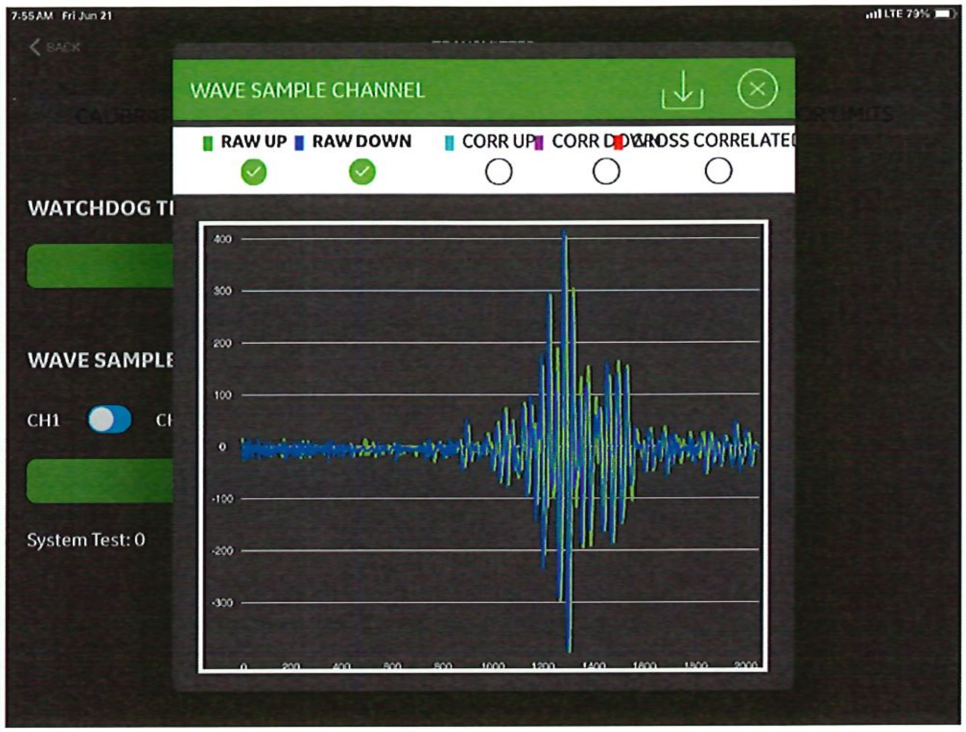
6/21/2024	8:00:00		3.88

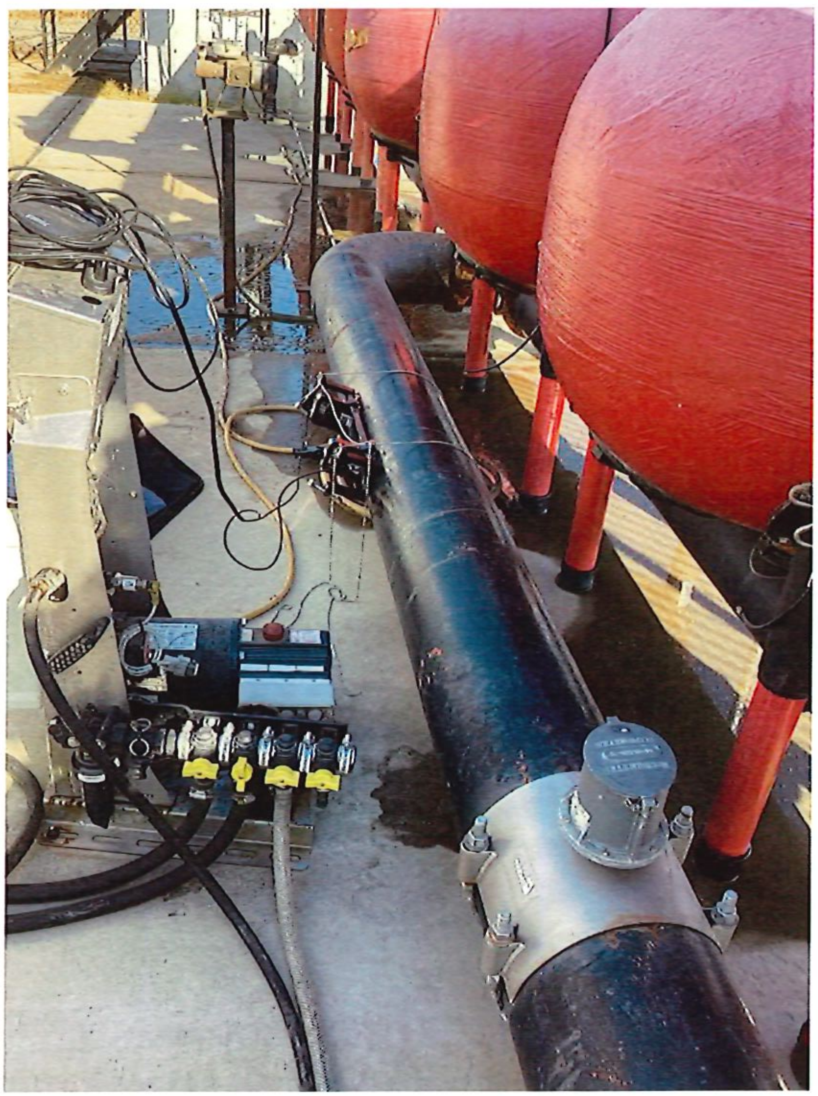
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	1700	
2	1750	
3	1700	
4	1700	Ave. Installed Device
5	1700	ft3/s
Ave.	1710	3.81

% Error	Operator Initials	Test Result
-1.7	CS, JG	Pass

SW157+087R-DRIP





Date	Time	Velocity	Volumetric	Standard Vo	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spee	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyna	Signal to No	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
4/26/2024	9:36:00	2.8182	2.3779	2.3754	148.2918	0	0	0	0	4822.012	26.8125	25.9375	49.4989	49.4989	0	31.7486	31.7471
4/26/2024	9:36:30	2.8485	2.4035	2.401	149.8885	0	0	0	0	4822.003	27.875	27.1875	50.0147	50.0147	0	32.0038	32.1234
4/26/2024	9:37:00	2.835	2.3921	2.3896	149.1774	0	0	0	0	4822.035	27.9375	27.25	50.0147	50.0147	0	32.0289	32.2043
4/26/2024	9:37:30	2.839	2.3955	2.393	149.3876	0	0	0	0	4822.09	27.8125	27	50.0147	50.0147	0	32.1152	32.1902
4/26/2024	9:38:00	2.8304	2.3882	2.3857	148.9345	0	0	0	0	4822.137	27.875	27.125	50.0147	50.0147	0	31.9942	32.1836
4/26/2024	9:38:30	2.815	2.3753	2.3728	148.1275	0	0	0	0	4822.155	27.8125	27.1875	50.0147	50.0147	0	32.0446	32.1347
4/26/2024	9:39:00	2.8353	2.3924	2.3898	149.1928	0	0	0	0	4822.186	27.75	26.9375	50.0147	50.0147	0	31.9909	32.1398
4/26/2024	9:39:30	2.832	2.3896	2.3871	149.0191	0	0	0	0	4822.232	27.625	27.0625	50.0147	50.0147	0	32.0354	32.1505
4/26/2024	9:40:00	2.7907	2.3547	2.3522	146.8461	0	0	0	0	4822.266	27.625	26.875	50.0147	50.0147	0	31.965	32.2172
4/26/2024	9:40:30	2.796	2.3592	2.3567	147.1237	0	0	0	0	4822.357	27.3125	26.75	50.0147	50.0147	0	32.0086	32.2142

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

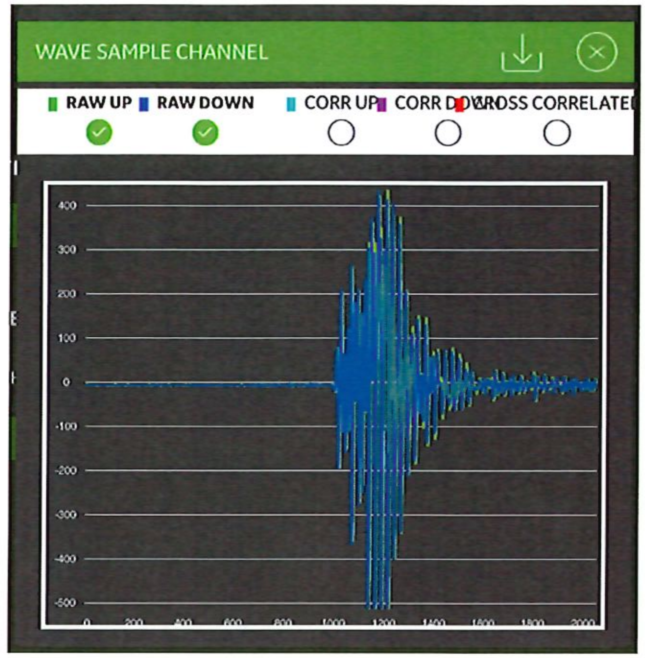
4/26/2024	9:38:00		2.39

5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

	gpm	
1	1100	
2	1000	
3	1100	
4	1100	Ave. Installed Device
5	1000	ft3/s
Ave.	1060	2.36

% Error	Operator Initials	Test Result
-1.0	CS, JG, SG	Pass

TO090+019L-DRIP



Date	Time	Velocity	Volumetric	Standard Vo	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spee	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyna	Signal to No	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
4/26/2024	8:24:00	4.207	2.4107	2.409	150.3868	0	0	0	0	4666.828	23.5625	22.4375	38.0586	38.0586	0	27.6392	27.4412
4/26/2024	8:24:30	4.1632	2.3856	2.3839	148.8219	0	0	0	0	4666.763	23.5	22.6875	38.0586	38.0586	0	27.6157	27.5635
4/26/2024	8:25:00	4.1782	2.3942	2.3925	149.3578	0	0	0	0	4666.874	23.4375	22.125	38.0586	38.0586	0	27.6533	27.3905
4/26/2024	8:25:30	5.6761	3.2525	3.2502	202.9029	0	0	0	0	4666.497	23.625	22.8125	38.0586	38.0586	0	27.7218	27.5108
4/26/2024	8:26:00	6.2503	3.5816	3.579	223.4295	0	0	0	0	4666.346	23.25	22.375	38.0586	38.0586	0	27.7642	27.4985
4/26/2024	8:26:30	6.0795	3.4837	3.4812	217.3235	0	0	0	0	4666.481	23.3125	22.25	38.0586	38.0586	0	27.7214	27.3913
4/26/2024	8:27:00	6.0459	3.4645	3.4619	216.1223	0	0	0	0	4666.475	23.6875	22.5625	38.0586	38.0586	0	27.7876	27.3663
4/26/2024	8:27:30	5.9779	3.4255	3.423	213.6924	0	0	0	0	4666.416	23.3125	22.0625	38.0586	38.0586	0	27.8097	27.2917
4/26/2024	8:28:00	5.9448	3.4065	3.404	212.5073	0	0	0	0	4666.32	23.1875	22.25	38.0586	38.0586	0	27.6722	27.4021
4/26/2024	8:28:30	5.8489	3.3516	3.3492	209.082	0	0	0	0	4666.376	23.6875	22.125	38.0586	38.0586	0	27.7471	27.382

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

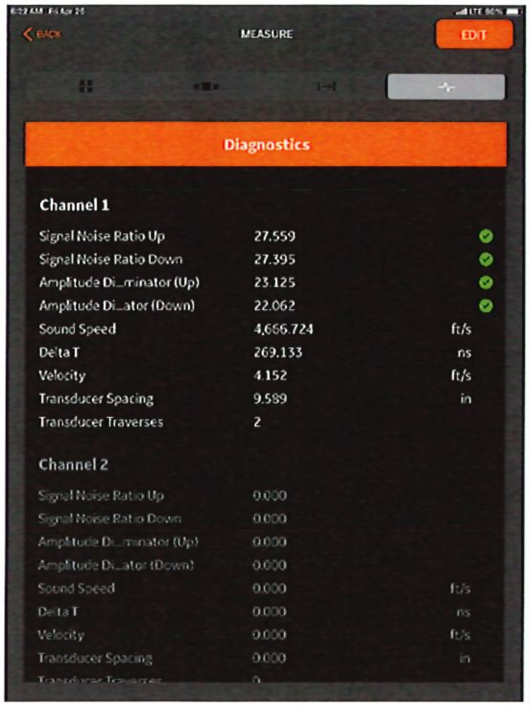
4/26/2024	8:26:15		3.12

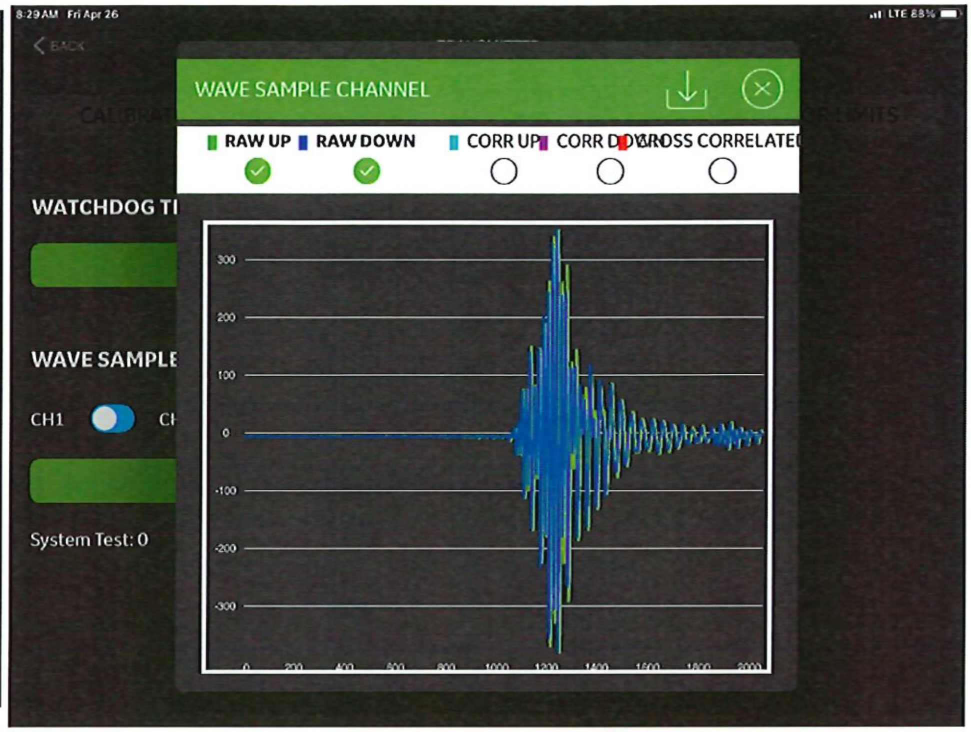
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

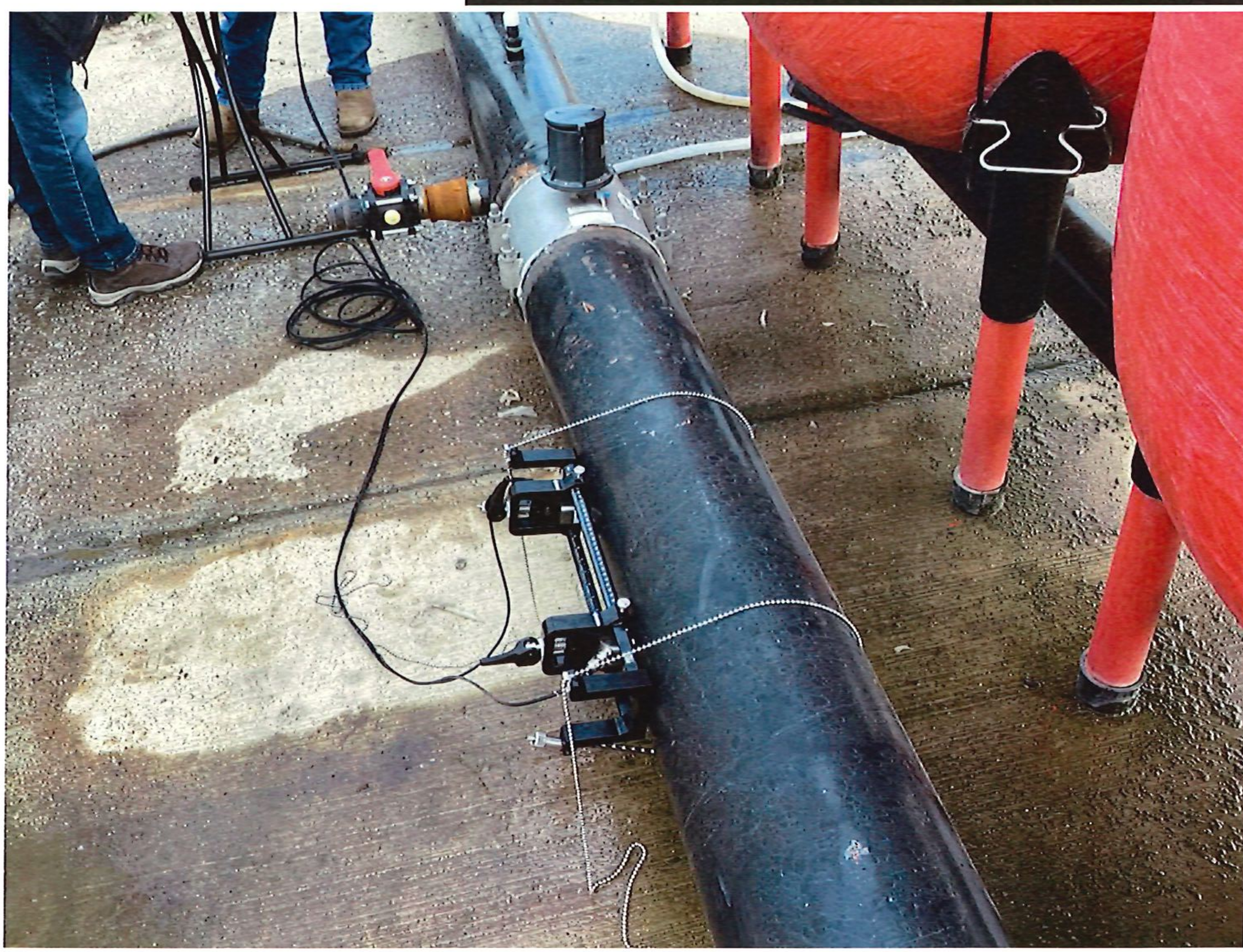
	gpm	
1	1150	
2	1100	
3	1500	
4	1500	Ave. Installed Device
5	1600	ft3/s
Ave.	1370	3.05

% Error	Operator Initials	Test Result
-2.0	CS, JG, SG	Pass

TS407+065L-DRIP







Date	Time	Velocity	Volumetric	Standard V	Mass	Batch Forw	Batch Reve	Batch Net T	Batch Total	Sound Spe	Amplitude I	Amplitude I	Gain Up	Gain Down	Signal Dyna	Signal to N	Signal to Noise Ratio Down
		ft/s	ft3/s	Sft^3/s	lb/s	gal	gal	gal	s	ft/s			db	db	db		
5/31/2024	12:28:00	6.1924	5.0682	5.0551	315.5778	0	0	0	0	4640.037	21.1875	20.8125	54.422	54.422	0	26.9754	27.0101
5/31/2024	12:28:30	6.2929	5.1505	5.1371	320.7005	0	0	0	0	4640.099	20.9375	21.0625	54.422	54.422	0	26.832	27.0737
5/31/2024	12:29:00	6.2215	5.0921	5.0789	317.0634	0	0	0	0	4640.085	21.1875	20.9375	54.422	54.422	0	27.3891	26.9304
5/31/2024	12:29:30	6.269	5.1309	5.1176	319.4825	0	0	0	0	4640.196	21.5625	20.9375	54.422	54.422	0	27.508	26.984
5/31/2024	12:30:00	6.1541	5.0369	5.0239	313.6309	0	0	0	0	4640.148	21.1875	20.9375	54.422	54.422	0	26.9121	27.0183
5/31/2024	12:30:30	6.1826	5.0602	5.0471	315.079	0	0	0	0	4640.27	21.375	20.6875	54.422	54.422	0	27.3916	26.9998
5/31/2024	12:31:00	6.218	5.0892	5.076	316.8869	0	0	0	0	4640.212	21	20.9375	54.422	54.422	0	27.2209	27.1296
5/31/2024	12:31:30	6.2014	5.0757	5.0625	316.0408	0	0	0	0	4640.32	21.25	21	54.422	54.422	0	27.3781	27.2293
5/31/2024	12:32:00	6.2068	5.0801	5.0669	316.3161	0	0	0	0	4640.363	21.1875	21.25	54.422	54.422	0	27.3233	27.2849
5/31/2024	12:32:30	6.2596	5.1232	5.1099	319.0027	0	0	0	0	4640.535	21.5	21.25	54.422	54.422	0	26.9124	27.2308

Congrats! Channel 1 Linear END!

Average of the PT 900 Log readings

Date	Time		Volumetric
5/31/2024	12:30:15		5.09

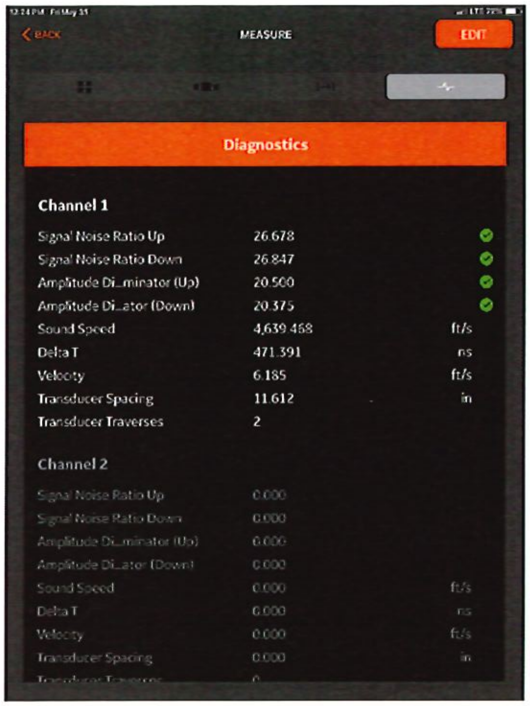
5 readings taken from the Installed Device (gpm)once the PT 900 Log starts

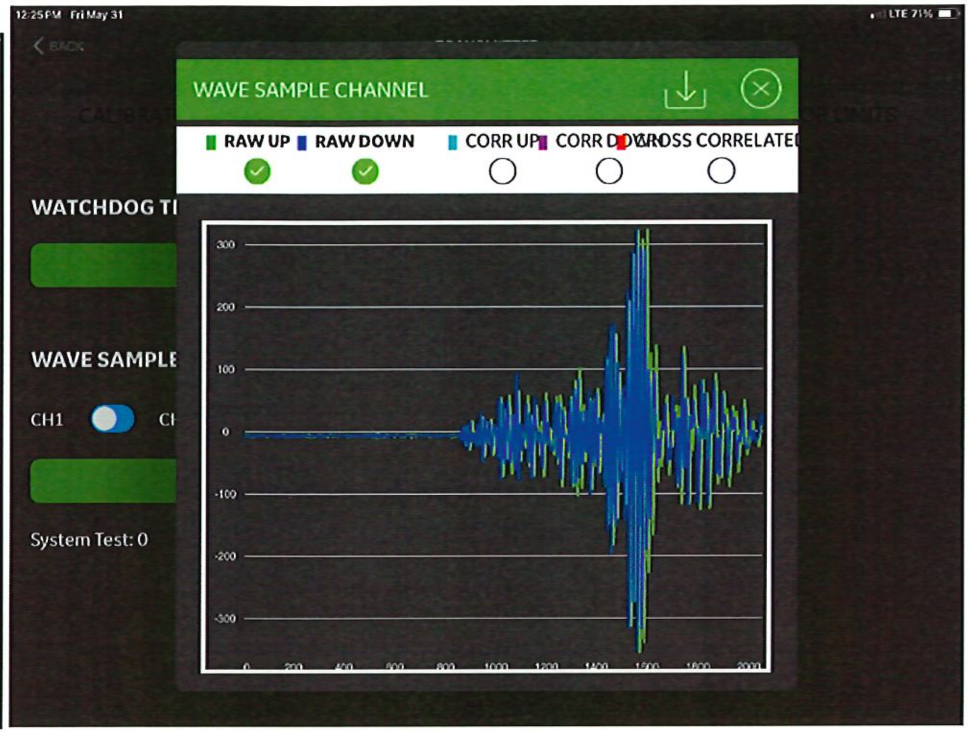
	gpm
1	2400
2	2500
3	2400
4	2400
5	2400
Ave.	2420

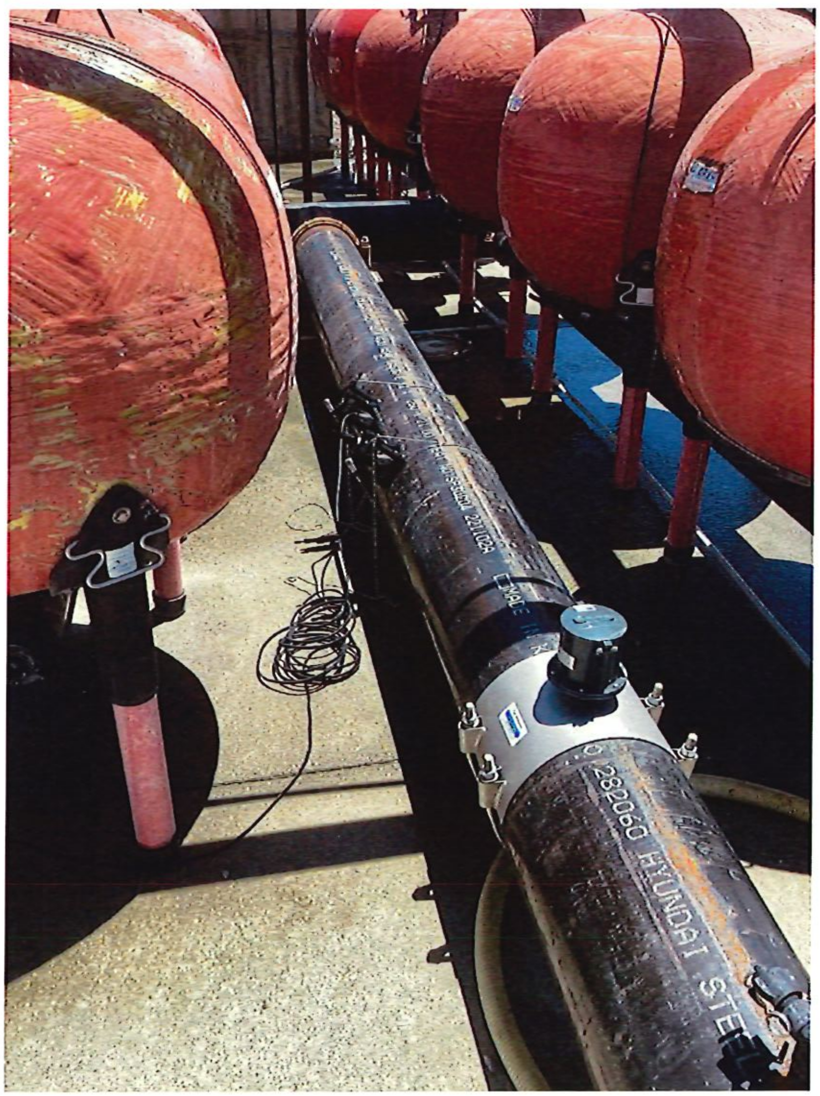
Ave. Installed Device
ft3/s
5.39

% Error	Operator Initials	Test Result
5.9	JG, SG	Pass

W1027+050L-DRIP







Attachment D

Company Sample Bills

SAN LUIS CANAL COMPANY
11704 W. Henry Miller Avenue
Dos Palos, California 93620
(209 826-5112 or 387-4305
FAX (209) 387-4237

Invoice Date:	07/31/2023
Account #:	97
Invoice #:	24821
Due Date:	08/31/2023

INVOICE

Larry & Rhonda Borelli
15768 S. Midway Rd
Los Banos, CA 93635

Water Usage July 2023

BILLING CODE	QUANTITY	UNIT TYPE	RATE	AMOUNT
Tier 1	173.630	acft	24.00	4,167.12
Tier 2	107.450	acft	28.00	3,008.60
	281.080			$7,175.72

Water deliveries will be terminated if balance is not paid by the 10th of the following month. SLCC reserves the right to charge a penalty of 5% on unpaid balances. A 1 1/2% fee will be added monthly until paid.

To pay this bill online visit your Shareholder Portal at www.slcc.net. Contact the Office to set up your WaterUI account.

Please detach here and retain upper portion for your records

Return this part with your payment to:

SAN LUIS CANAL COMPANY
P.O. Box 1330
Suisun City, CA 94585-4330

"Amount Due" --> $7,175.72

"Pay Amount" --> $____________

Invoice #:	24821
Invoice Date:	07/31/2023
Account #:	97
Name:	Borelli, Larry & Rhonda
Due Date:	08/31/2023

WATER DELIVERY REPORT

Date Printed: 7/1/2024
Time Printed: 8:13 AM

READING | **DISTRIBUTION**

Turnout	Reading Date	State	Head	Open	Cfs Reading	Hours	AF Delivered	Water User	Field	Crop	Cfs Flow	AF Delivered
MI184+068L	7/6/23 6:00	On	9.50	5.00	5.91	18.00	8.79	Borelli, Larry & Rhonda	B-16	Alfalfa	3.15	4.69
	7/6/23 6:00							Borelli, Larry & Rhonda	B-15	Alfalfa	2.76	4.10
MI184+068L	7/7/23 7:00	Off	9.50	5.00	5.91	7.00	3.42	Borelli, Larry & Rhonda	B-15	Alfalfa	2.76	1.60
	7/7/23 7:00							Borelli, Larry & Rhonda	B-16	Alfalfa	3.15	1.82
Turnout Totals:						**50.00**	**12.21**					**12.21**
MI199+089L	7/6/23 15:00	On	8.00	6.00	2.59	9.00	1.93	Borelli, Larry & Rhonda	B-14	Alfalfa	2.59	1.93
MI199+089L	7/7/23 14:00	Off	8.75	10.75	5.59	14.00	6.47	Borelli, Larry & Rhonda	B-14	Alfalfa	5.59	6.47
Turnout Totals:						**23.00**	**8.40**					**8.40**
MI203+078L	7/5/23 7:00	On	6.00	6.75	3.54	17.00	4.97	Borelli, Larry & Rhonda	B-13	Alfalfa	1.89	2.65
	7/5/23 7:00							Borelli, Larry & Rhonda	B-12	Alfalfa	1.65	2.32
MI203+078L	7/6/23 0:00	Run	4.00	9.00	3.65	24.00	7.24	Borelli, Larry & Rhonda	B-12	Alfalfa	1.70	3.37
	7/6/23 0:00							Borelli, Larry & Rhonda	B-13	Alfalfa	1.95	3.87
MI203+078L	7/6/23 15:00	Off	4.00	9.00	3.65	-9.00	-2.71	Borelli, Larry & Rhonda	B-12	Alfalfa	1.70	-1.26
	7/6/23 15:00							Borelli, Larry & Rhonda	B-13	Alfalfa	1.95	-1.45
MI203+078L	7/6/23 15:00	On	4.00	4.25	2.03	9.00	1.51	Borelli, Larry & Rhonda	B-12	Alfalfa	0.95	0.71
	7/6/23 15:00							Borelli, Larry & Rhonda	B-13	Alfalfa	1.08	0.80
MI203+078L	7/7/23 6:00	Off	4.00	4.25	2.03	6.00	1.01	Borelli, Larry & Rhonda	B-13	Alfalfa	1.08	0.54
	7/7/23 6:00							Borelli, Larry & Rhonda	B-12	Alfalfa	0.95	0.47
Turnout Totals:						**94.00**	**12.02**					**12.02**
MI220+091R	7/15/23 7:00	On	18.50	4.50	4.57	17.00	6.42	Borelli, Larry & Rhonda	B-11	Cotton	4.57	6.42
MI220+091R	7/16/23 0:00	Run	17.00	4.50	4.38	24.00	8.69	Borelli, Larry & Rhonda	B-11	Cotton	4.38	8.69
MI220+091R	7/17/23 6:00	Off	17.00	4.50	4.38	6.00	2.17	Borelli, Larry & Rhonda	B-11	Cotton	4.38	2.17
Turnout Totals:						**47.00**	**17.28**					**17.28**
MI263+082L	7/5/23 6:00	On	5.75	10.25	4.87	18.00	7.24	Borelli, Larry & Rhonda	B-5	Alfalfa	4.87	7.24
MI263+082L	7/6/23 6:00	Off	5.75	10.25	4.87	6.00	2.41	Borelli, Larry & Rhonda	B-5	Alfalfa	4.87	2.41
Turnout Totals:						**24.00**	**9.65**					**9.65**
PR012+011L	7/13/23 6:00	On	2.75	15.00	4.81	18.00	7.16	Borelli, Larry & Rhonda	B-4	Cotton	4.81	7.16
PR012+011L	7/14/23 0:00	Run	1.50	15.00	3.55	24.00	7.04	Borelli, Larry & Rhonda	B-4	Cotton	3.55	7.04
PR012+011L	7/15/23 0:00	Run	1.00	14.50	2.83	24.00	5.61	Borelli, Larry & Rhonda	B-4	Cotton	2.83	5.61
PR012+011L	7/16/23 6:00	Off	1.00	14.50	2.83	6.00	1.40	Borelli, Larry & Rhonda	B-4	Cotton	2.83	1.40
PR012+011L	7/31/23 6:00	On	2.25	17.00	4.60	18.00	6.84	Borelli, Larry & Rhonda	B-4	Cotton	4.60	6.84
Turnout Totals:						**90.00**	**28.05**					**28.05**
PR021+040L	7/13/23 7:00	On	2.00	10.00	2.80	17.00	3.93	Borelli, Larry & Rhonda	B-4	Cotton	2.80	3.93
PR021+040L	7/14/23 0:00	Run	1.00	14.50	2.83	24.00	5.61	Borelli, Larry & Rhonda	B-4	Cotton	2.83	5.61

WATER DELIVERY REPORT

READING | DISTRIBUTION

Turnout	Reading Date	State	Head	Open	Cfs Reading	Hours	AF Delivered	Water User	Field	Crop	Cfs Flow	AF Delivered
PR021+040L	7/15/23 0:00	Run	1.00	15.50	2.96	24.00	5.87	Borelli, Larry & Rhonda	B-4	Cotton	2.96	5.87
PR021+040L	7/16/23 6:00	Off	1.00	15.50	2.96	6.00	1.47	Borelli, Larry & Rhonda	B-4	Cotton	2.96	1.47
Turnout Totals:						**71.00**	**16.88**					**16.88**
PR028+045L	7/13/23 7:00	On	1.00	14.50	2.83	17.00	3.98	Borelli, Larry & Rhonda	B-4	Cotton	2.83	3.98
PR028+045L	7/14/23 0:00	Run	1.50	10.00	2.43	24.00	4.82	Borelli, Larry & Rhonda	B-4	Cotton	2.43	4.82
PR028+045L	7/15/23 6:00	Off	1.50	10.00	2.43	6.00	1.20	Borelli, Larry & Rhonda	B-4	Cotton	2.43	1.20
PR028+045L	7/31/23 6:00	On	0.75	15.75	2.59	18.00	3.85	Borelli, Larry & Rhonda	B-4	Cotton	2.59	3.85
Turnout Totals:						**65.00**	**13.85**					**13.85**
PR029+043L	7/31/23 6:00	On	1.25	14.00	3.09	18.00	4.60	Borelli, Larry & Rhonda	B-2	Cotton	3.09	4.60
Turnout Totals:						**18.00**	**4.60**					**4.60**
TO059+041L	7/15/23 7:00	On	7.00	4.00	2.55	17.00	3.58	Borelli, Larry & Rhonda	B-21	Cotton	2.55	3.58
TO059+041L	7/16/23 0:00	Run	7.00	4.00	2.55	24.00	5.06	Borelli, Larry & Rhonda	B-21	Cotton	2.55	5.06
TO059+041L	7/17/23 7:00	Off	7.00	4.00	2.55	7.00	1.48	Borelli, Larry & Rhonda	B-21	Cotton	2.55	1.48
Turnout Totals:						**48.00**	**10.12**					**10.12**
TO062+028R	7/5/23 7:00	On	9.50	4.50	3.27	17.00	4.59	Borelli, Larry & Rhonda	B-19/20	Alfalfa	3.27	4.59
TO062+028R	7/6/23 7:00	Off	9.50	4.50	3.27	7.00	1.89	Borelli, Larry & Rhonda	B-19/20	Alfalfa	3.27	1.89
Turnout Totals:						**24.00**	**6.48**					**6.48**
TO117+090R	7/13/23 7:00	On	4.00	8.50	2.86	17.00	4.02	Borelli, Larry & Rhonda	B-8	Cotton	2.86	4.02
TO117+090R	7/14/23 0:00	Run	4.50	8.50	3.03	24.00	6.01	Borelli, Larry & Rhonda	B-8	Cotton	3.03	6.01
TO117+090R	7/15/23 0:00	Run	4.50	8.50	3.03	24.00	6.01	Borelli, Larry & Rhonda	B-8	Cotton	3.03	6.01
TO117+090R	7/16/23 0:00	Run	4.50	8.50	3.03	24.00	6.01	Borelli, Larry & Rhonda	B-8	Cotton	3.03	6.01
TO117+090R	7/17/23 7:00	Off	4.50	8.50	3.03	7.00	1.75	Borelli, Larry & Rhonda	B-8	Cotton	3.03	1.75
TO117+090R	7/31/23 7:00	On	2.50	11.50	3.21	17.00	4.51	Borelli, Larry & Rhonda	B-8	Cotton	3.21	4.51
Turnout Totals:						**113.00**	**28.31**					**28.31**
TO124+049R	7/13/23 7:00	On	3.50	10.00	3.25	17.00	4.57	Borelli, Larry & Rhonda	B-8	Cotton	3.25	4.57
TO124+049R	7/14/23 0:00	Run	4.00	10.00	3.48	24.00	6.90	Borelli, Larry & Rhonda	B-8	Cotton	3.48	6.90
TO124+049R	7/15/23 0:00	Run	4.00	10.00	3.48	24.00	6.90	Borelli, Larry & Rhonda	B-8	Cotton	3.48	6.90
TO124+049R	7/16/23 0:00	Run	4.00	10.00	3.48	24.00	6.90	Borelli, Larry & Rhonda	B-8	Cotton	3.48	6.90
TO124+049R	7/17/23 7:00	Off	4.00	10.00	3.48	7.00	2.01	Borelli, Larry & Rhonda	B-8	Cotton	3.48	2.01
TO124+049R	7/31/23 7:00	On	2.00	10.50	2.60	17.00	3.65	Borelli, Larry & Rhonda	B-8	Cotton	2.60	3.65
Turnout Totals:						**113.00**	**30.93**					**30.93**
TO134+012R	7/13/23 7:00	On	3.00	10.50	3.19	17.00	4.48	Borelli, Larry & Rhonda	B-8	Cotton	3.19	4.48
TO134+012R	7/14/23 0:00	Run	3.50	10.50	3.44	24.00	6.82	Borelli, Larry & Rhonda	B-8	Cotton	3.44	6.82

WATER DELIVERY REPORT

Date Printed: 7/1/2024
Time Printed: 8:13 AM

READING | **DISTRIBUTION**

Turnout	Reading Date	State	Head	Open	Cfs Reading	Hours	AF Delivered	Water User	Field	Crop	Cfs Flow	AF Delivered
TO134+012R	7/15/23 0:00	Run	3.50	10.50	3.44	24.00	6.82	Borelli, Larry & Rhonda	B-8	Cotton	3.44	6.82
TO134+012R	7/16/23 0:00	Run	3.50	10.50	3.44	24.00	6.82	Borelli, Larry & Rhonda	B-8	Cotton	3.44	6.82
TO134+012R	7/17/23 7:00	Off	3.50	10.50	3.44	7.00	1.99	Borelli, Larry & Rhonda	B-8	Cotton	3.44	1.99
TO134+012R	7/31/23 7:00	On	3.00	9.50	2.83	17.00	3.98	Borelli, Larry & Rhonda	B-8	Cotton	2.83	3.98
Turnout Totals:						**113.00**	**30.91**					**30.91**
WT073+075L	7/17/23 7:00	On	13.50	8.00	4.46	17.00	6.27	Borelli, Larry & Rhonda	B-10	Cotton	4.46	6.27
WT073+075L	7/18/23 7:00	Off	13.50	8.00	4.46	7.00	2.58	Borelli, Larry & Rhonda	B-10	Cotton	4.46	2.58
Turnout Totals:						**24.00**	**8.85**					**8.85**
WT088+022L	7/18/23 7:00	On	1.00	12.50	1.83	17.00	2.57	Borelli, Larry & Rhonda	B-7	Cotton	1.83	2.57
WT088+022L	7/19/23 0:00	Run	1.00	13.50	1.94	24.00	3.85	Borelli, Larry & Rhonda	B-7	Cotton	1.94	3.85
WT088+022L	7/20/23 7:00	Off	1.00	13.50	1.94	7.00	1.12	Borelli, Larry & Rhonda	B-7	Cotton	1.94	1.12
Turnout Totals:						**48.00**	**7.54**					**7.54**
WT092+067L	7/17/23 7:00	On	1.50	16.00	2.42	17.00	3.40	Borelli, Larry & Rhonda	B-7	Cotton	2.42	3.40
WT092+067L	7/18/23 0:00	Run	1.50	16.00	2.42	24.00	4.80	Borelli, Larry & Rhonda	B-7	Cotton	2.42	4.80
WT092+067L	7/19/23 0:00	Run	2.00	16.00	2.83	24.00	5.61	Borelli, Larry & Rhonda	B-7	Cotton	2.83	5.61
WT092+067L	7/20/23 7:00	Off	2.00	16.00	2.83	7.00	1.64	Borelli, Larry & Rhonda	B-7	Cotton	2.83	1.64
Turnout Totals:						**72.00**	**15.45**					**15.45**
WT097+093E	7/17/23 7:00	On			4.80	17.00	6.74	Borelli, Larry & Rhonda	B-6	Cotton	4.80	6.74
WT097+093E	7/18/23 0:00	Run			5.00	24.00	9.92	Borelli, Larry & Rhonda	B-6	Cotton	5.00	9.92
WT097+093E	7/19/23 7:00	Off			5.00	7.00	2.89	Borelli, Larry & Rhonda	B-6	Cotton	5.00	2.89
Turnout Totals:						**48.00**	**19.55**					**19.55**
Delivery Totals:						**1,085.00**	**281.08**					**281.08**

Water Delivery Summary

Billing Period 7/1/2023 - 7/31/2023

Larry & Rhonda Borelli

Account #: 97

Turnout	Canal	Field	acft
MI184+068L	MIDWAY CANAL	B-15	5.70
MI184+068L	MIDWAY CANAL	B-16	6.51
MI199+089L	MIDWAY CANAL	B-14	8.40
MI203+078L	MIDWAY CANAL	B-12	5.61
MI203+078L	MIDWAY CANAL	B-13	6.41
MI220+091R	MIDWAY CANAL	B-11	17.28
MI263+082L	MIDWAY CANAL	B-5	9.65
PR012+011L	PARSLEY DITCH	B-4	28.05
PR021+040L	PARSLEY DITCH	B-4	16.88
PR028+045L	PARSLEY DITCH	B-4	13.85
PR029+043L	PARSLEY DITCH	B-2	4.60
TO059+041L	TOSCANO DITCH	B-21	10.12
TO062+028R	TOSCANO DITCH	B-19/20	6.48
TO117+090R	TOSCANO DITCH	B-8	28.31
TO124+049R	TOSCANO DITCH	B-8	30.93
TO134+012R	TOSCANO DITCH	B-8	30.91
WT073+075L	W. TOSCANO DITCH	B-10	8.85
WT088+022L	W. TOSCANO DITCH	B-7	7.54
WT092+067L	W. TOSCANO DITCH	B-7	15.45
WT097+093E	W. TOSCANO DITCH	B-6	19.55
			281.08

Usage Summary

Total YTD Usage: 568.32

Allocation: 1425.68, Allocated Usage: 568.32, Remaining Balance: 857.36

Attachment E

Groundwater Banking Agreement

AGREEMENT
FOR A TEMPORARY WATER RECHARGE PROGRAM /
FUTURE YEAR TRANSFER / EXCHANGE

This Agreement for a Temporary Water Recharge Program / Future Year Transfer / Exchange ("Agreement") is made and entered into effective as of September 6, 2019 ("Effective Date"), by and between Rosedale-Rio Bravo Water Storage District ("Rosedale") and the San Joaquin River Exchange Contractors Water Authority ("EC"), collectively referred to herein as ("Parties").

RECITALS

A. Rosedale anticipates having up to 15,000 acre-feet (AF) of recharge capacity available through the end of calendar year 2019 and desires to maximize its water management opportunities; and

B. The EC anticipates having up to 15,000 AF of water available from the effective date of this Agreement through the end of calendar year 2019 that will be available to transfer and/or deliver to Rosedale under a 2:1 exchange program for a future year return and/or a water transfer program; and

C. The Parties desire to enter into this Agreement specifying the terms and conditions of a water transfer and short-term water exchange program under which a portion of the water transferred may be returned under certain conditions to the EC.

Now, therefore, incorporating the foregoing recitals herein, the parties agree to a water transfer and exchange program with the following terms and conditions:

1. **Term:** The term of this Agreement shall be from Effective Date through December 31, 2025. The delivery of EC water to Rosedale shall be through December 31, 2019.

Rosedale's return of any water delivered pursuant to the exchange program shall be returned to EC by December 31, 2025, subject to the terms and conditions described in Article 6 hereof.

2. **Water Quantity:** The EC may make up to 15,000 AF of water available for exchange and/or transfer to Rosedale pursuant to this Agreement.

a. The EC may designate up to 5,000 AF of water delivered to Rosedale for a future year return ("Exchange Water"). For every two (2) AF designated as Exchange Water, Rosedale shall be obligated to return to EC one (1) AF ("Return Water"). The amount of Return Water shall not exceed 2,500 AF. In 2019, the first 5,000 AF delivered shall be designated Exchange Water subject to the EC right to re-designate the water under Paragraph 2(b) and 2(c).

b. The EC may designate all water delivered to Rosedale as transfer water with no future year return obligation ("Transfer Water")

c. Upon execution of this Agreement, the EC shall provide to Rosedale an anticipated schedule of deliveries for 2019 and a designation as to how much of the anticipated deliveries that it desires to be classified as Exchange Water and Transfer Water, respectively. No later than December 31, 2019, the EC shall make a final designation of how much of the actual water delivered to Rosedale that it desires to be accounted for as Transfer Water or Exchange Water, respectively. The total amount to be designated as Exchange Water shall not be greater than 5,000 AF.

d. Notwithstanding the foregoing, Rosedale may halt and terminate deliveries of the up to 15,000 AF if, in Rosedale's sole discretion, Rosedale determines that further deliveries may impair or impact Rosedale's current or future water management programs and commitments, or reduce the water supply benefits available to Rosedale from its current or future water management programs or commitments; Rosedale shall explain the reasons it is halting further deliveries. Except as otherwise set forth herein, Rosedale may not refuse to exchange and return to the EC any water delivered and accepted at the 1 AF exchanged and returned for each 2 AF delivered and accepted by Rosedale up to the 5,000 AF delivered by the EC. Rosedale shall give prompt written notice to the EC to terminate deliveries if it wishes to limit its obligation to exchange and return the up to 2,500 AF to the EC to a lesser quantity and that notice shall not affect the obligation to return water already transferred at the 1 AF for each 2 AF transferred.

3. **Point of Delivery:** The point of delivery ("POD") for the Transfer, Exchange and Return Water shall be the O'Neill Forebay unless the parties agree to any other POD by mutual written agreement. The Parties shall reasonably cooperate with any other third parties to implement the delivery of water or the return of water. Neither Rosedale nor the EC shall be required to accept any additional burden, cost or risk of loss as a result of the proposed cooperation for and on behalf of the Parties with third parties. No assignment of the duties provided herein to third parties by either Rosedale or the EC shall be valid without the written approval of each Party.

4. **Costs:**

a. EC shall be responsible for all costs to the POD for their Transfer and Exchange Water. Rosedale shall be responsible for all costs downstream of the POD. Rosedale shall be responsible for all costs to get the Return Water to the POD identified herein. The EC shall be responsible for all costs to convey the Return Water from the POD to the EC service area. The Return Water shall not be CVP Project water, nor include any requirements under Reclamation law acreage limitation or reporting requirements, nor require payments of costs or charges of the Bureau of Reclamation or CVP other than Warren Act conveyance charges through the Delta-Mendota Canal, if any, from the

O'Neill Forebay to the EC. If Warren Act charges are attributable to the water, the EC shall bear those transportation costs from the O'Neill Forebay to the EC delivery points from the Mendota Pool.

b. For every AF of Transfer Water delivered by the EC to Rosedale at the POD and accepted by Rosedale as of December 31, 2019, Rosedale shall pay the EC $125 per AF. Upon execution of this agreement, the EC shall invoice Rosedale for 50% of the anticipated Transfer Water (as designated under 2.c., above) and Rosedale shall submit payment within 30 days of receipt of such invoice. The EC shall invoice Rosedale for the remaining balance once the final quantity of water is delivered to the POD. EC shall reconcile the amount owed or due based upon the final quantities of Transfer Water actually delivered as of December 31, 2019. Rosedale shall submit payment within 30 days of receipt of such final invoice.

c. For every AF of Return Water delivered to the EC, the EC shall pay Rosedale the actual energy costs associated with the recovery of water from Rosedale's groundwater banking project within Rosedale's service area, which is currently estimated to be $60 per AF. Rosedale agrees that the costs shall not exceed $100/AF and agrees that the 15% loss factor to be applied to the Return Water only shall not be subject to an energy charge. In the event Rosedale utilizes available surface supplies to effect the return of water to the EC at Rosedale, Rosedale shall nevertheless be entitled to energy costs on the Return Water as if the Return Water had been pumped from the groundwater banking project, notwithstanding that the surface supply may be utilized by Rosedale to make the Return Water available. No energy cost shall be applied to the 15% of Return Water not made available to the EC.

5. **Scheduling:** Upon execution of this agreement, the EC shall promptly submit to Rosedale a schedule identifying the rates and quantities of water available for delivery

to Rosedale. under the Exchange Water and Transfer Water provisions. The schedule and availability of water may be amended by mutual agreement of the Parties. Subject to Rosedale's discretion described in Article 2.d. above, Rosedale shall make best efforts to accept delivery of the water per the schedule. EC shall provide to Rosedale, by May 1 of each year until the end of the term, a schedule for any Return Water requested in that year. The Parties shall meet and confer to finalize any scheduling of Return Water by the EC.

6. **Return Water:**

   a. Rosedale shall deliver to the EC an amount of Return Water equal to 1 acre-foot for every 2 acre-feet of water that is delivered as Exchange Water, minus stipulated losses of 15% which shall be measured and subtracted from the return water delivered to the EC at the POD at O'Neill Forebay.

   b. Rosedale's obligation for delivery of Return Water to the EC is subject to available capacity within Rosedale's facilities, existing at the time of this Agreement, and available water supplies at the time of the requested return. Subject to Rosedale's discretion described in Article 2.d. above, Rosedale shall make best efforts to meet the request for Return Water after meeting its first priority contractual obligations and obligations to it landowners and existing banking partners. The last date for the EC to schedule the delivery to the EC of Return Water is May 1. If Rosedale provides by written notice during the period of April 1 through April 30 that it is unable to return the water during the period for the return requested by the EC in the year the EC requests the return, Rosedale shall provide the EC notice of its election to implement one of the following: i) Rosedale shall pay the EC within forty-five (45) days of that written election the amount paid per acre-foot pursuant to the then current multi-year Transfer Agreement in effect between the EC and the San Luis & Delta-Mendota Water Authority for ag service contractors' use utilizing the Bureau of Reclamation percentage of AG service contract delivery for San Luis Unit deliveries on the date of the election by Rosedale. For each acre-foot paid for by Rosedale, the EC shall transfer a like amount of its Return Water to Rosedale; (ii) Rosedale may elect to deliver to the EC Return Water no later than June 1, in a year in which the EC has elected to receive Return Water, by providing for delivery of the Return Water amounts required from a holder of entitlement in San Luis Reservoir, and Rosedale shall pay all costs and charges associated therewith; or (iii) Rosedale may elect to defer the delivery of Return Water to a subsequent year in which the EC request Return Water, provided that there will be sufficient time left during the term of this Agreement to deliver Return Water to EC and upon the condition that in a subsequent year in which the EC request the Return Water deferred, the EC may, if further deferral is elected by Rosedale, insist upon payment under the terms of Paragraph 6(b)i (SLDMWA Transfer Rate). Under each alternative, upon the Return Water being received and available, the EC shall pay Rosedale the energy cost calculated as specified in Paragraph 4(d) and the Return Water amount provided shall be reduced by 15% for estimated losses. During the term of this Agreement, if Rosedale and the EC agree, the EC may convert any Return Water owed by Rosedale to Transfer Water, subject to Rosedale's approval as to price and any other term.

c. Rosedale shall bear any taxes, assessments, costs, expenses or other charges related to the quantity of water designated as Return Water or the act of delivering the Return Water during the period of its retention by Rosedale. Rosedale shall indemnify, defend and hold harmless the EC from any costs, claims, actions or expenses of whatsoever nature or kind arising from the delivery of the Return Water or from the recovery of the Return Water quantity in the Rosedale-Rio Bravo Water Storage District, including without excluding others, attorney's fees, expert witness fees, or similar expenses incurred in the defense of any such claim.

d. The rights and obligations of the parties herein may not be assigned or transferred without the prior written approval of each party hereto, and any attempt to provide for assignment or transfer without that prior written approval shall be void and of no legal effect. Notwithstanding the foregoing, Rosedale may transfer or assign Transfer Water to Westside Mutual Water Company in its discretion without the prior written approval of EC.

e. If Rosedale shall contend that there are limitations upon its ability to return the Return Water within the 2,500 AF limit, Rosedale shall explain the factual basis for the lack of capacity or limitations described in Paragraph 6.b. and the limitations of its best efforts.

7. **Approvals:** The parties recognize that the delivery of water under this Agreement is subject to the approval of various agencies and the parties shall cooperate to secure any and all necessary approvals for implementation of this Agreement. EC shall be responsible for obtaining the necessary Bureau of Reclamation Approvals, including any environmental documentation, if required. Rosedale shall be responsible for obtaining any approvals from the Kern County Water Agency and Department of Water Resources, as well as any environmental documentation, if required. The Parties shall cooperate in obtaining any necessary approvals to affect the delivery of Return Water.

8. **Force Majeure**: All obligations of the parties other than monetary or payment obligations shall be suspended for so long as and to the extent the performance thereof is prevented, directly or indirectly, by earthquakes, fires, tornadoes, facility failures, floods, drought, strikes, other casualties, acts of God, orders of court or governmental agencies having competent jurisdiction, or other events or causes beyond the control of the parties. Upon cessation of the force majeure condition, the obligation shall remain enforceable. In no event shall any liability accrue against a party, its officers, agents or employees, for any damage arising out of or connected with a suspension of performance pursuant to this Section 8. When a party's performance is prevented by a cause identified herein, the affected party shall provide written notice to the other party as soon as reasonably practical of the force majeure condition. Such notice shall identify the cause of the prevention of performance and the estimated length that such prevention of performance will likely remain in place. Promptly after the prevention of performance is removed or ceases, the affected party shall provide written notice to the non-affected party that states that the prevention of performance has been removed or ceased and performance of the Agreement has been or will be renewed. If there is Return Water undelivered to EC because of a force majeure condition or because the date of December 31, 2025 and termination of this Agreement has occurred, Rosedale

shall pay the San Luis Delta-Mendota-EC agreement AG transfer rate in effect based on the Bureau of Reclamation percentage of AG contract supply delivery declaration for the San Luis Unit contractors on the date Rosedale elected to defer delivery of Return Water or the date of April 1 of the year in which the force majeure was first claimed to apply during the term of this Agreement, whichever date is earlier.

In Witness Whereof, the parties hereto have caused this Agreement to be executed the day and year first above written.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT

By: ______________________________
Eric Averett, General Manager

SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY

By: ______________________________
Chris White, Executive Director

Attachment F

Lab Water Sample Monthly Report

APPL WATER QUALITY SUMMARY SAN LUIS CANAL COMPANY

Boundary Drain									
Analyte:	Units:	3/15/2023	4/12/2023	5/24/2023	6/14/2023	7/13/2023	8/23/2023	9/20/2023	10/19/2023
Boron (B)	mg/L	0.67	0.49	0.28	0.2	0.21	0.17	0.19	0.22
Selenium (Se)	mg/L	0.0012	ND	ND	ND	ND	ND	ND	ND
EC	umhos/cm	1900	990	790	580	620	460	550	600

Salt Slough & Sand Dam									
Analyte:	Units:	3/15/2023	4/12/2023	5/24/2023	6/14/2023	7/13/2023	8/23/2023	9/20/2023	10/19/2023
Boron (B)	mg/L	0.21	0.23	0.12	0.14	0.089	0.12	0.16	0.15
Selenium (Se)	mg/L	ND	ND	ND	ND	ND	ND	ND	ND
EC	umhos/cm	900	1200	480	680	390	400	530	500

SLCC Intake at San Joaquin River Sack Dam									
Analyte:	Units:	3/15/2023	4/12/2023	5/24/2023	6/14/2023	7/13/2023	8/23/2023	9/20/2023	10/19/2023
Boron (B)	mg/L	0.035	ND	ND	ND	ND	0.069	0.09	0.11
Selenium (Se)	mg/L	ND	ND	ND	ND	ND	ND	ND	ND
EC	umhos/cm	120	73	68	31	31	210	280	290
Bicarbinate as (CaCO3)	mg/L	no test	no test	22	no test	14	no test	no test	no test
Calcium (Ca)	mg/L	no test	no test	4.8	no test	3.3	no test	no test	no test
Carbonate as (CaCO3)	mg/L	no test	no test	ND	no test	ND	no test	no test	no test
Chloride	mg/L	no test	no test	1.1	no test	ND	no test	no test	no test
Hydroxide as (CaCO3)	mg/L	no test	no test	ND	no test	ND	no test	no test	no test
Magnesium (Mg)	mg/L	no test	no test	1.4	no test	1.3	no test	no test	no test
Nitrate	mg/L	no test	no test	ND	no test	ND	no test	no test	no test
pH	pH	no test	no test	6.5	no test	7.6	no test	no test	no test
Potassium (K)	mg/L	no test	no test	1.3	no test	1.1	no test	no test	no test
Sodium (Na)	mg/L	no test	no test	3	no test	2.2	no test	no test	no test
Sodium Absorption Ratio	na	no test	no test	0.44	no test	ND	no test	no test	no test
Sulfate	mg/L	no test	no test	1.6	no test	1.7	no test	no test	no test
Total Alkalinity as (CaCO3)	mg/L	no test	no test	22	no test	14	no test	no test	no test
Total Dissolved Solids	mg/L	no test	no test	34	no test	11	no test	no test	no test

Attachment G

Annual Drainage Monitoring Report

MLJ ENVIRONMENTAL

2023 Surface Water Annual Monitoring Report

March 2022 – February 2023

San Joaquin Valley Drainage Authority
Westside San Joaquin River Watershed Coalition

Irrigated Lands Regulatory Program
Central Valley Regional Water Quality Control Board

Submitted June 30, 2023

TABLE OF CONTENTS

LIST OF APPENDICES AND ATTACHMENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AG	Agriculture
AI	Active Ingredient
AQ	Aquatic
BMP	Best Management Practice
BU	Beneficial Use
CalPIP	California Pesticide Information Portal
CEDEN	California Environmental Data Exchange Network
COC	Chain of Custody
CVRWQCB	Central Valley Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DO	Dissolved Oxygen
DPR	(California) Department of Pesticide Regulation
DQO	Data Quality Objective
DWR	(California) Department of Water Resources
EPA	Environmental Protection Agency
FD	Field Duplicate
FE	Farm Evaluation
INMP	Irrigation and Nitrogen Management Plan
ILRP	Irrigated Land and Regulatory Program
K_{oc}	Organic Carbon Partitioning Coefficient
LABQA	Laboratory Quality Assurance
LC50	Lethal Concentration at 50% mortality
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
MCL	Maximum Contaminant Level
MDL	Minimum Detection Limit
MPN	Most Probable Number
MRP	Monitoring and Reporting Program
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MUN	Municipal and Domestic Supply
NA	Not Applicable
ND	Not Detected
NMP	Nitrogen Management Plan
OP	Organophosphate pesticides
PAM	Polyacrylamide
PCA	Pesticide Control Advisor

pH	Power of Hydrogen
PUR	Pesticide Use Report
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
REC 1	Water Contact Recreation
RL	Reporting Limit
RPD	Relative Percent Difference
SC	Specific Conductance
SD	Standard Deviation
SG	Statistically significantly different from control; greater than 80% threshold
SL	Statistically significantly different from control; less than 80% threshold
SOP	Standard operating procedure
SWAMP	Surface Water Ambient Monitoring Program
SWAT	Surface Water Assessment Tool
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TSS	Total Suspended Solids
TU	Toxic Unit
WQO	Water Quality Objective
WQTL	Water Quality Trigger Limit
YSI	Yellow Springs Instruments

LIST OF UNITS

°C	degrees Celsius
cfs	cubic feet per second
cm	centimeter
dw	dry weight
g	gram
kg	kilogram
L	liter
lbs	pounds
mg	milligram
mL	milliliter
mm	millimeter
MPN/100mL	most probable number per 100 milliliters
ng	nanograms
NTU	Nephelometric Turbidity Units

sec	second
μg	microgram
μg/kg dw	microgram per kilogram of dry weight
μm	micrometer
μmhos	micromhos
μS	microsiemens

LIST OF TERMS

Agricultural Commissioner – County Agriculture Commissioner
ArcGIS – Geographic Information Systems mapping software
Central Valley– California Central Valley
Coalition –Westside San Joaquin River Watershed Coalition
Coalition/WSJRWC region – The region within the Central Valley that is monitored by the Westside San Joaquin River Watershed Coalition
Drainage –Water that moves horizontally across the surface or vertically into the subsurface from land.
General Order (WDR) –Waste Discharge General Order R5-2014-0029-R1
Landowners – One or more persons responsible for the management of the irrigated land.
Regional Water Board – Central Valley Regional Water Quality Control Board
Tributary Rule – Beneficial uses for Coalition monitoring sites are applied based on the most immediate downstream waterbody (not applied to constructed agricultural drains such as ones in Delta islands).
Waterbody –Standing or flowing water of any size that may or may not move into a larger body of water, including lakes, reservoirs, ponds, rivers, streams, tributaries, creeks, sloughs, canals, laterals and drainage ditches.
Watershed – The land area that drains into a stream; the watershed for a major river may encompass a number of smaller watersheds that ultimately combine at a common point (EPA terms of environment: http://www.epa.gov/OCEPAterms/wterms.html).

ANNUAL REPORT REQUIREMENTS – SECTION KEY

REQUIRED SECTION: ANNUAL MONITORING AND MANAGEMENT PLAN UPDATE REPORTS	SECTION NAME/LOCATION – ANNUAL REPORT
1. Signed Transmittal Letter	Cover Letter
2. Title page	2023 Surface Water Annual Report
3. Table of contents	Table of Contents, List of Tables, List of Figures, List of Appendices and Attachments
4. Executive Summary	Executive Summary
5. Description of the Coalition Group geographical area	Introduction and Geographical Area
6. Monitoring objectives and design	Monitoring Objectives and Design
7. Sampling site descriptions and rainfall records for the time period covered under the AMR	Sampling Site Descriptions and Rainfall Records
8. Location map(s) of sampling/monitoring wells, crops, and land uses	Sampling Site Descriptions and Locations, Appendix II (Land Use Maps)
9. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible	Attachment A: Electronic Data Submittal
10. Discussion of data relative to water quality objectives/trigger limits, and water quality management plan milestones, Basin Plan Amendment Workplan (BPAW) updates, where applicable	Monitoring Results, Status of Management Plans
11. Electronic Data Submittal	Attachment A: Electronic Data Submittal
12. Sampling and analytical methods used	Methods
13. Associated laboratory and field quality control samples results	Attachment A: Electronic Data Submittal
14. Summary of Quality Assurance Evaluation results (as identified in the most recent version of the third-party's approved Quality Assurance Project Plan (QAPP) for Precision, Accuracy and Completeness)	Quality Assurance Evaluation Results
15. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event	Methods
16. Summary of exceedances of water quality objectives/trigger limits occurring during the reporting period and surface water related pesticide use information	Coalition Actions to Address Exceedances of WQOs
17. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented	Coalition Actions to Address Exceedances of WQOs and Member Actions to Address Exceedances of WQOs

REQUIRED SECTION: ANNUAL MONITORING AND MANAGEMENT PLAN UPDATE REPORTS	SECTION NAME/LOCATION – ANNUAL REPORT
18. Evaluation of monitoring data to identify temporal and spatial trends and patterns	Evaluation of Management Practice Effectiveness/ Management Practices/Trends in Coalition Monitoring Data
19. Irrigation and Nitrogen Management Plan (INMP) Summary Report Evaluation	Nitrogen Management Plan Summary Report Analysis (stand-alone document*)
20. Summary of management practice information collected as part of Farm Evaluations	Farm Evaluation Results Analysis (stand-alone document*)
21. Summary Comparisons of township Groundwater Protection Targets and actual value achieved for each township	Not applicable. Process pending.
22. Summary of mitigation monitoring	Mitigation Monitoring Report
23. Summary of education and outreach activities	Coalition Actions to Address Exceedances of WQOs and Member Actions to Address Exceedances of WQOs
24. Conclusions and recommendations	Conclusions and Recommendations

QC- Quality Control
SWAMP- Surface Water Ambient Monitoring Program
WQOs – Water Quality Objectives
*Submitted with the Annual Management Practices Implementation and Nitrogen Application Report (annually on November 30).

EXECUTIVE SUMMARY

The Westside San Joaquin River Watershed Coalition (WSJRWC or Coalition) is submitting the 2023 Surface Water Annual Report which includes an update to the Coalition's Surface Water Management Plan Progress Report, management plan implementation schedules/timelines, monitoring results for the 2022 Monitoring Period (March 2022 through February 2023), and a record of Coalition outreach activities to meet the requirements of the Waste Discharge Requirements General Order for General Order for Growers within the Westside San Joaquin River Watershed Coalition (WDR or General Order; Order R5-2014-0002-09). The primary objectives of the monitoring program are to characterize discharge from irrigated agriculture and to determine if implemented management practices are effective in reducing or eliminating discharge and impairments of beneficial uses (BUs).

The 2023 Surface Water Annual Report includes updates on the status and methods used to 1) identify agriculture sources of discharges resulting in exceedances of Water Quality Trigger Limits (WQTL), 2) track implemented management practices, and 3) document progress toward meeting its performance goals and management plan implementation schedules and timelines as outlined in the WSJRWC Comprehensive and Constituent-Specific Surface Water Quality Management Plans (approved August 8, 2018).

MONITORING PROGRAM SUMMARY

The Coalition's monitoring sites have been designated as Discharge sites, Source Water sites, and Special Monitoring Sites according to the type of water that is conveyed through the site. Discharge sites convey agricultural drainage water. Source Water sites are located on waterways that are the source of irrigation water used by growers in the Coalition. Special Monitoring Sites include Wetland Supply Channels which supply freshwater to private, state, and federal refuges within the Coalition boundary.

Samples were collected during the 2022 Monitoring Period at Discharge and Source Water sites, including two rain and two sediment monitoring events. The Coalition also conducted Special Project Monitoring including monitoring to address management plans and Total Maximum Daily Load (TMDL) monitoring.

Monitoring during the 2022 Monitoring Period was conducted at sites in the WSJRWC region according to the strategy outlined in the Monitoring and Reporting Program (MRP), Attachment B to the WDR, and according to Coalition's 2022 Monitoring Plan Update (MPU; approved February 17, 2022).

Results from monitoring include exceedances of the WQTLs for dissolved oxygen (DO; 76), pH (85), specific conductivity (SC; 79), *E. coli* (63), ammonia (12), arsenic (13), boron (43), molybdenum (27), selenium (2), DDE (1), DDT (1), diuron (2), methomyl (1), and pyrethroids (24). Monitoring also resulted in water column toxicity to *C. dubia* (1), *H. azteca* (21), and *S. capricornutum* (4) and sediment toxicity to *H. azteca* (4). The exceedances and toxicities in the 2022 Monitoring Period resulted in 6 new management plans.

MANAGEMENT PLAN STRATEGY

When a management plan is developed for a site subwatershed, additional focused education and outreach efforts within the site subwatershed are required:

1. Identify members with the potential to discharge to surface waters causing exceedances of WQTLs of management plan constituents.
2. Review the member's FE survey from the year prior to initiation of Management Plan activities to determine number/type of management practices currently in place, and determine if additional practices are necessary.
3. Hold meetings as necessary to inform members of water quality impairments and recommend additional practices.
4. Review the member's FE survey from the year following initiation of Management Plan activities to document number/type of new management practices implemented.
5. Evaluate effectiveness of new management practices.

During the 2022 Monitoring Period, the Coalition and its members took actions to address requirements of the WDR and recent water quality impairments. The Coalition submitted multiple documents for approval to the Central Valley Regional Water Quality Control Board (Regional Water Board) to meet the requirements of the WDR pertaining to Farm Evaluations (FEs), Nitrogen Management Plans (NMPs), and Sediment and Erosion Control Plans (SECPs). The Coalition also continued its Focused Outreach process to targeted growers to address exceedances of pesticides. The Focused Outreach process involves discussing water quality impairments as well as management practices designed to reduce runoff due to irrigation and stormwater.

CONCLUSIONS

Overall, water quality in the Coalition region is improving. The Coalition's management plan strategy is effective at identifying water quality impairments, and addressing them through education, outreach, and implementation of management practices. Improvements in water quality result in the successful completion of management plans (68 total complete management plans to date).

Since the initiation of Focused Outreach in 2018, there has been a declining trend in water quality impairments. However, water quality impairments continue to occur, in part, due to growers constantly changing land ownership, lease agreements, land use, and the Coalition continually accepting new members.

RECOMMENDATIONS

The Coalition identified several areas in which CVRWQCB involvement could result in improvement in water quality in the Coalition region:

1. Continue enforcement actions against non-members who have the potential to discharge.

2. Move forward with the processes to develop plans to study contamination of surface waters by *E. coli*, causes of elevated pH, and low DO.
3. Continue to work with the CV-SALTS process to develop a better understanding of the sources and sinks of salt in surface and groundwater and potential practices that can be effective in preventing exceedances.

INTRODUCTION

As outlined in the Waste Discharge Requirements General Order for Growers within the Westside San Joaquin River Watershed Coalition (WDR or General Order; Order R5-2014-0002-09), the Westside San Joaquin River Watershed Coalition (WSJRWC or Coalition) is submitting the Surface Water Annual Report and monitoring results from the 2022 Monitoring Period (March 2022 through February 2023). The Coalition is including the 2023 Groundwater Annual Report, which provides an update on the Coalition's Groundwater Quality Management (GQMP) and the Groundwater Quality Trend Monitoring Program (GQTM) in Appendix I.

The 2023 Annual Surface Water Report addresses the reporting requirements for the Monitoring Report (WDR Attachment B) and Management Plan Progress Report (MPPR; WDR Appendix MRP-1). The Surface Water Annual Report Requirements Section Key (Page xii) lists the required components as outlined in the WDR along with their respective location in this report.

GEOGRAPHICAL CHARACTERISTICS AND IRRIGATED LAND

The WSJRWC area is located on the west side of the San Joaquin River from approximately the Stanislaus River on the north to 10 miles south of Mendota. Most of the Coalition area receives water from the Central Valley Project, while certain areas receive water from the State Water Project. In addition, some areas receive water from the San Joaquin River, Kings River, groundwater wells, and other local water sources. The Delta-Mendota Canal and San Luis Canal run through the Coalition area. Water deliveries are made to Federal Central Valley Project Contractors and to San Joaquin River Exchange Contractors from these facilities. State water deliveries are also made to one area, the Oak Flat Water District.

The communities of Grayson, Westley, Vernalis, Crows Landing, Patterson, Newman, Gustine, Los Banos, Dos Palos, South Dos Palos, Firebaugh, Mendota, and Tranquility lie within the Coalition geographic area. These communities do not have discharges from irrigated lands and are not included in the WSJRWC; however, these communities contribute stormwaters and municipal waste waters to the Coalition area which may impact water quality in the Coalition region.

Interstate Highway 5, State Highways 33, 140, 165, 152, and many county roads run through the Coalition geographic area. Storm water discharges from these roads and highways can contribute contaminants to the same waterbodies that carry agricultural return water.

IRRIGATED LAND

Although exact acreage is difficult to estimate due to rapidly changing land use, the Coalition area includes approximately 1,241,326 acres of which 357,367 acres (29%) are considered irrigated agriculture (measured in ArcGIS; Table 1). To obtain information on land use acreage, the Coalition used information from the California Department of Water Resources (DWR) Land Use Viewer (https://gis.water.ca.gov/app/CADWRLandUseViewer/). The DWR data reflect the 2019 agricultural land use, managed wetlands, and urban boundaries for all 58 counties in California.

The data are prepared by Land IQ and provided to DWQ and other resource agencies across the state for current land use information and are derived from a combination of remote sensing, agronomic analyses, and ground verification systems.

For more information on subwatershed boundaries in the Coalition area, see the land use maps in Appendix II.

Table 1. Total county and farmed acreages within the WSJRWC boundary.

COUNTY	TOTAL COUNTY ACREAGE (MEASURED IN ARCGIS)	FARMED ACREAGE (DWR[1])
Fresno	172,581	77,284
Madera	28,495	22,244
Merced	622,135	170,022
San Benito	28,567	0
San Joaquin	22,434	7,159
Santa Clara	681	0
Stanislaus	395,681	90,549
Total	**1,270,574**	**367,258**

[1] Acreage data from 2019, obtained from https://gis.water.ca.gov/app/CADWRLandUseViewer/.

MONITORING OBJECTIVES AND DESIGN

The objectives of the WSJRWC surface water monitoring program are:

1. Determine the concentration of waste(s) in discharges to surface waters.
2. Evaluate compliance with existing narrative and numeric water quality objectives to determine if implementation of additional management practices is necessary to improve and/or protect water quality.
3. Assess the impact of waste discharges from irrigated agriculture to surface water.
4. Determine the degree of implementation of management practices to reduce discharges of specific wastes that impact water quality in watersheds within the Coalition region.
5. Determine the effectiveness of management practices and strategies to reduce discharges of wastes that impact water quality.

As part of the Coalition's monitoring design, monitoring is conducted to 1) characterize discharge from irrigated agriculture, 2) characterize the condition of irrigation source waters, and 3) address management plans and Total Maximum Daily Load (TMDL) compliance requirements.

The Coalition's monitoring scheme is comprised of a three-year monitoring cycle, monitoring types, and monitoring site groups. The Monitoring Period is split into two seasons: the irrigation season (March through August) and the non-irrigation season (September through February). In October 2015, the Coalition committed to financially support the Delta Regional Monitoring Program (RMP). To offset the RMP cost, there is no non-irrigation season monitoring during the months of November and December, unless there is a rain event. The Coalition attempts to sample at least two rain events per reporting year to characterize periods of high flows and stormwater runoff. Rain events are monitored for the full suite of constituents.

For the 2022 Monitoring Period, sampling occurred monthly from March 2022 through February 2023 and included two storm monitoring events (details are included in the 'Rainfall Records' section of this report) and two sediment monitoring events.

MONITORING YEAR TYPES

During the continuous three-year monitoring cycle there is one year of Assessment Monitoring and two years of Targeted Monitoring. The 2022 Monitoring Period was a Targeted Monitoring year.

Assessment Monitoring consists of the general water quality parameters, nutrients, pathogen indicators, water column and sediment toxicity, pesticides, and metals as described in the Monitoring Plan Update (MPU). Constituents identified for monitoring will generally be the same in all months, except for pesticides, which will be monitored according to the schedule developed through the Pesticide Evaluation Protocol (PEP). Assessment Monitoring includes monitoring at sites categorized in all site groups (Discharge Sites, Source Water Sites, and Wetland Supply Channel Sites) for the Assessment Monitoring constituents listed above, management plant constituents, and required TMDL monitoring.

Targeted Monitoring occurs during two consecutive years in the cycle to address four scenarios 1) exceedances that occurred in the previous Assessment Monitoring year, 2) constituents in management plans, 3) constituents monitored to satisfy a TMDL requirement, and 4) pesticides identified by the frequency determined by PEP. Targeted Monitoring is scheduled when parameters of interest are expected to be present. During Targeted Monitoring periods, monitoring will vary by month and by site and will be determined based on historical exceedances, PEP results, management plan requirements, and TMDL requirements.

MONITORING SITE GROUPS

The Coalition's monitoring sites are designated into groups according to the type of water conveyed through the site (Discharge Sites, Source Water Sites, and Wetland Supply Channel Sites).

Monitoring at Discharge Sites

Discharge Sites are monitored regularly to track trends in surface water quality and to identify water quality impairments (Table 2). When a water quality objective or trigger limit is exceeded at any Discharge Site, the parameter associated with the exceedance must be included in the Targeted Monitoring schedule for two additional years.

The 2022 monitoring occurred at all 17 Discharge Sites according to the strategy outlined in the 2022 MPU (approved February 17, 2022).

Table 2. WSJRWC Discharge Sites.

Sites listed alphabetically.

Station Name	Site Code	Station Code	Latitude	Longitude
Blewett Drain at Highway 132	VH132	541XVH132	37.6398	-121.22871
Del Puerto Creek at Highway 33	DPCHW	541XDPCHW	37.51407	-121.15961
Del Puerto Creek near Cox Road	DPCCR	541XDPCCR	37.53937	-121.12211
Hospital Creek at River Road	HCARR	541STC042	37.61048	-121.23081
Ingram Creek at River Road	ICARR	541STC040	37.60023	-121.22511
Los Banos Creek at China Camp Road	LBCCC	541XLBCCC	37.11448	-120.88951
Los Banos Creek at Highway 140	LBCHW	541MER554	37.2762	-120.95551
Marshall Road Drain near River Road	MRDRR	652XMRDRR	37.43632	-121.03621
Mud Slough Upstream of San Luis Drain	MSUSL	541XMSUSL	37.25852	-120.90684
Newman Wasteway near Hills Ferry Road	NWHFR	541XNWHFR	37.32037	-120.98341
Orestimba Creek at Farm Bridge	OCAFB	541XOCAFB	37.40516	-121.02276
Poso Slough at Indiana Ave	PSAIA	541XPSAIA	37.00621	-120.59031
Ramona Lake near Fig Avenue	ROLFA	541XROLFA	37.47876	-121.06841
Salt Slough at Lander Ave	SSALA	541MER531	37.24798	-120.85231
Salt Slough at Sand Dam	SSASD	541XSSASD	37.13665	-120.76191
San Joaquin River at Lander Ave	SJRLA	541MER522	37.29507	-120.85141
Westley Wasteway near Cox Road	WWNCR	541XWWNCR	37.55823	-121.16371

Monitoring at Source Water Sites

Source Water Sites are located on waterways that carry water primarily used as irrigation water to growers in the Coalition (Table 3). Monitoring results from Source Water Sites are used to characterize the incoming irrigation source water and do not represent irrigation drainage discharges. Source Water Sites are monitored for chlorpyrifos and diazinon as required by the Basin Plan Amendment to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for The Control of Diazinon and Chlorpyrifos Discharges (hereafter referred to as the Chlorpyrifos and Diazinon TMDL BPA). Source Water Sites are excluded from the PEP because they do not have input from agriculture.

During the 2022 Monitoring Period, the Coalition collected samples for field parameters and metals at all three Source Water Sites during all months of monitoring.

Table 3. WSJRWC Source Water Sites.

Station Name	Site Code	Station Code	Latitude	Longitude
San Joaquin River at Sack Dam	SJRSD	541MAD007	36.98353	-120.5005
San Joaquin River at PID Pumps	SJRPP	541XSJRPP	37.49739	-121.08267
Delta Mendota Canal at DPWD	DMCDP	541XDMCDP	37.43678	-121.13347

Monitoring at Wetland Supply Channel Sites

The San Luis and Santa Fe Canals are Wetland Supply Channels that supply fresh water to private, state, and federal wetland refuges in the Coalition region (Table 4). Historically, these two channels were monitored through the Grassland Bypass Project (GBP) and periodic exceedances of the Water Quality Trigger Limit (WQTL) for selenium occurred.

The Coalition now monitors these sites during both Assessment and Targeted Monitoring years. The Coalition collected weekly samples for boron and selenium at monitoring sites on the Santa Fe and San Luis Canals as indicated in the 2022 MPU. Monitoring results for the Wetland Supply Channel Sites are presented and discussed in Appendix III.

Table 4. WSJRWC Wetland Supply Channel Sites.

Station Name	Site Code	Station Code	Latitude	Longitude
Santa Fe Canal at Hwy 152 (Site M3)	SFC152	541SFC152	37.054450	-120.785681
San Luis Canal at Hwy 152 (Site L3)	SLC152	541SLC152	37.056484	-120.803989

SPECIAL MONITORING

The Coalition conducts Special Monitoring for 1) sites monitored as part of the Coalition's Surface Water Quality Management Plans (SQMPs), 2) sites monitored for TMDL compliance, and 3) constituents where monitoring is mandated by the Regional Water Board.

Surface Water Management Plan Monitoring

The objectives of the WSJRWC SQMPs include:

1. Identification of irrigated agriculture source (general practice or specific location) that may be the cause of the water quality impairment or develop a study design to determine the source.
2. Identification of management practices to be implemented to address the exceedances.
3. Development of a management practice implementation schedule designed to address the specific exceedances.
4. Development of management practice performance goals.
5. Development of waste-specific monitoring schedule.
6. Development of a process and schedule for evaluating management practice effectiveness.

As part of the Coalition's management plan strategy, Targeted monitoring to address management plans is conducted to evaluate the efficiency of newly implemented management practices. For details on results for monitoring to address management plans during the 2022 Monitoring Period, refer to the 'Status of Management Plans' section of this report.

Management plans are required if more than one exceedance of a WQTL occurs within a three-year period for a constituent at a site.

The WDR specifies that management plans must be completed as soon as practicable and must not exceed 10 years from the date the management plan is reported to the Regional Board.

Management Plan Constituent Monitoring

The Coalition monitors for constituents in management plans according to the strategy outlined in the approved Comprehensive and Constituent Specific (SQMP). Monitoring of management plan constituents is conducted as part of the Coalition's Management Plan Strategy and involves identifying contaminant sources, Focused Outreach and education, and evaluating the effectiveness of member implemented management practices. The Coalition identifies where and when outreach is to occur by evaluating 1) which management plans are reaching the 10-year compliance deadline in the next three years, and 2) recently initiated management plans or reinstated management plans.

After three years of monitoring with no exceedances of the WQTLs for a specific management plan constituent and documentation of implemented management practices, the Coalition can submit a request for management plan completion to the Regional Water Board

Management Plan Development Timelines

In 2018, the Coalition began addressing watersheds in management plans by conducting Focused Outreach. Focused Outreach is an effective strategy which includes additional outreach and education with growers who use products that could contribute to water quality impairments (Table 5). The Coalition continues to conduct Focused Outreach in watersheds as soon as practicable such that management plans are completed within the 10-year management plan compliance deadline.

Table 5 includes all watersheds that have received Focused Outreach and education as well as the 2023 Focused Outreach watersheds.

Table 5. Management plan watersheds and Focused Outreach schedules.

Management Plan	Watershed	Priority Set	Focused Outreach Years
2018 SQMP	Hospital Creek	2018 Focused Outreach	2018-2020
	Ingram Creek		
	Marshall Road Drain		
	Orestimba Creek		
	Del Puerto Creek	2019 Focused Outreach	2019-2021
	Newman Wasteway		
	Salt Slough[1]		
	Los Banos Creek	2020 Focused Outreach	2020-2022
	Ramona Lake		
	Westley Wasteway		
	Blewett Drain	2021 Focused Outreach	2021-2023
	Mud Slough		
	Del Puerto Creek	2022 Focused Outreach	2022-2024
	Hospital Creek		
	Marshall Road Drain		
	Westley Wasteway	2023 Focused Outreach	2023-2025
	Salt Slough[1]		
	Ingram Creek		

[1]Salt Slough watershed includes Poso Slough.

TMDL Monitoring

During the 2022 Monitoring Period, TMDL monitoring occurred to evaluate compliance with approved TMDLs for diazinon and chlorpyrifos, pyrethroids, salts (SC), and boron.

Chlorpyrifos and Diazinon TMDL

On March 11, 2021, the ESJWQC and WSJRWC requested the Regional Water Board approve a reduction in the monitoring and reporting for the chlorpyrifos and diazinon TMDL due to the current ban on chlorpyrifos applications and the improved water quality with respect to diazinon. The Regional Water Board approved the request to discontinue chlorpyrifos monitoring at the TMDL capacity (river) and allocation (tributary) sites and to target diazinon monitoring based on the PEP (approved May 7, 2021). The Regional Water Board also approved the request to submit a reduced TMDL Annual Report; the ESJWQC and WSJRWC have provided the reduced San Joaquin River Chlorpyrifos and Diazinon 2022 WY TMDL AMR as an Appendix to this report (Appendix IV).

Pyrethroid TMDL

On April 22, 2019, the US EPA approved the Basin Plan Amendment for the Control of Pyrethroid Pesticide Discharges (Pyrethroid BPA). The six pyrethroids identified for monitoring in the Pyrethroid BPA are bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin, and permethrin. The Pyrethroid BPA requires a Pyrethroid Management Plan for 303(d) listed waterbodies which receive agricultural discharges to be submitted 60 days after US EPA approval

(Table IV-W of the Pyrethroid BPA). Based on the 2018 303(d) list, there are three waterbodies, Del Puerto Creek, Hospital Creek, and Ingram Creek, that are on the 303(d) list as an impaired waterbody for pyrethroids from agriculture.

The trigger limit for pyrethroids, as outlined in Attachment 1 of the Pyrethroid BPA, is determined by the chronic additive pyrethroid trigger which is equal to one (1) chronic additive concentration goal unit (CGU). The CGU is calculated as the sum of individual measured pyrethroid concentration-to-chronic concentration goal ratios.

The Pyrethroid BPA requires baseline monitoring to be completed by October 18, 2021. Baseline monitoring includes water column pyrethroid sampling, and water column toxicity to *H. azteca;* water column toxicity to *H. azteca* is monitored concurrently with pyrethroid water column monitoring and sediment toxicity which is conducted twice a year. The Coalition uses the PEP analysis to determine the pyrethroid sampling schedule. If baseline monitoring results in more than one exceedance of the pyrethroid CGU in a three-year period, the Coalition is required to develop a pyrethroid management plan for that location. After baseline monitoring is completed, if a management plan is required, trend monitoring is required at the sites with pyrethroid management plans. Further discussion is provided in the "Status of TMDLs" section.

Salt and Boron TMDL

The Salt and Boron Discharges Control Program (hereafter referred to as the Control Program) established numeric objectives for Specific Conductance (SC) on the Lower San Joaquin River at Airport Way Bridge near Vernalis, located at the southern end of the Delta. The Control Program was developed to manage the discharge of salt and boron from irrigated lands without restricting the ability of the dischargers to export salt out of the San Joaquin basin. The Control Program was developed in two phases through Basin Plan Amendments. The first amendment was adopted in September 2004 by the Regional Board and established salt and boron TMDLs for seven geographic subareas of the LSJR drainage basin. The first phase also included a compliance schedule based on prioritization of subareas contributing the most salt per acre. The second amendment was adopted in June 2017 by the Regional Board and established salinity WQOs in the LSJR between the Merced and Stanislaus Rivers. The salinity Water Quality Objectives (WQOs) were developed by the LSJR Committee which was a stakeholder-driven subcommittee of the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative. The second phase of the Control Program was approved by the US EPA on December 17, 2018. The amendment establishes the WQOs for SC as 1,550 µS/cm and 2,470 µS/cm during extended dry periods.

Managing salt and nitrate in surface and groundwater is expected to be an ongoing effort over many decades; however, the identified actions, policies, and timelines presented in the amendments demonstrate stakeholders' commitments to ensuring safe drinking water, balanced loadings, and restored groundwater.

SAMPLE SITE LOCATIONS AND DESCRIPTIONS

The section below includes a narrative description of each sampling site with respect to irrigated acres, hydrology, and agricultural production. Individual watershed maps including sample site location and land use are provided in Appendix II. The watersheds, monitoring locations, and location coordinates of all monitoring sites during the 2022 Monitoring Period are provided in Table 6; monitoring locations are also indicated in Figure 1. Land use for each watershed is provide in Table 7 and maps are provided in Appendix II.

Table 6. WSJRWC monitoring locations.

WATERSHED	MONITORING LOCATION	LATITUDE	LONGITUDE
Discharge Sites			
Blewett Drain	Blewett Drain at Highway 132	37.6398	-121.22871
Del Puerto Creek	Del Puerto Creek at Highway 33	37.51407	-121.15961
	Del Puerto Creek near Cox Rd	37.53937	-121.12211
Hospital Creek	Hospital Creek at River Rd	37.61048	-121.23081
Ingram Creek	Ingram Creek at River Rd	37.60023	-121.22511
Los Banos Creek	Los Banos Creek at China Camp Rd	37.11448	-120.88951
	Los Banos Creek at Highway 140	37.2762	-120.95551
Marshall Rd	Marshall Road Drain near River Rd	37.43632	-121.03621
Mud Slough	Mud Slough u/s San Luis Drain	37.25852	-120.90684
Newman Wasteway	Newman Wasteway near Hills Ferry Rd	37.32037	-120.98341
Orestimba Creek	Orestimba Creek at Farm Bridge	37.40516	-121.02276
Salt Slough	Poso Slough at Indiana Avenue	37.00621	-120.59031
Ramona Lake	Ramona Lake near Fig Avenue	37.47876	-121.06841
Salt Slough	Salt Slough at Lander Avenue	37.24798	-120.85231
	Salt Slough at Sand Dam	37.13665	-120.76191
SJR at Lander	San Joaquin River at Lander Avenue	37.29507	-120.85141
Westley Wasteway	Westley Wasteway near Cox Rd	37.55823	-121.16371
Source Water Sites			
NA	San Joaquin River at Sack Dam	36.98353	-120.5005
NA	San Joaquin River at PID Pumps	37.49739	-121.08267
NA	Delta Mendota Canal at DPWD	37.43678	-121.13347
Wetland Supply Channel Monitoring Sites			
NA	Santa Fe Canal at Hwy 152 (Site M3)	37.054450	-120.785681
NA	San Luis Canal at Hwy 152 (Site L3)	37.056484	-120.803989

NA – Not applicable.

Table 7. WSJRWC land use acreages by watersheds.

Watersheds listed alphabetically. Table only includes watersheds for Discharge sites. Acreages are rounded to nearest whole number.

Land Use	Blewett Drain Watershed	Blewett Drain-Represented Watershed	Del Puerto Creek Watershed	Del Puerto Creek-Represented Watershed	Hospital Creek Watershed	Hospital Creek-Represented Watershed	Ingram Creek Watershed	Ingram Creek-Represented Watershed	Los Banos Creek Watershed	Los Banos Creek-Represented Watershed	Marshall Road Drain Watershed	Marshall Road Drain-Represented Watershed	Mud Slough Watershed	Mud Slough-Represented Watershed	Newman Wasteway Watershed	Newman Wasteway-Represented Watershed	Orestimba Watershed	Orestimba-Represented Watershed	Ramona Lake Watershed	Salt Slough Watershed	Salt Slough-Represented Watershed	San Joaquin River at Lander-Represented	San Joaquin River at Sac Dam-Represented	Spanish Land Grant Drain Watershed	Westley Wasteway Watershed	Westley-Represented Watershed	Grand Total
C | Citrus And Subtropical	22		214		133				260				1		63	49	472	231	15	5			239		2	46	1,752
D | Deciduous Fruits And Nuts	1,198	1,736	6,064	981	6,635	1,261	4,299	1,662	22,648		6,113	624	2,871		3,268	12,682	6,818	4,723	408	7,081		6,275	27,508	1,147	3,361	2,456	131,818
F | Field Crops	192	328	717	591	13		1,216	434	11,574		764	755	4,990		1,194	11,786	678	3,385	317	36,420		10,927	4,820	1,297	290	595	93,284
G | Grain And Hay Crops		485	252	175	501	63	23	174	5,620		1,194	162	986		440	2,196	416	392	402	5,481		1,833	844	134		117	21,888
No CA DWR Data	183	385	1,490	722	4,082	850	986	3,920	42,826	1,926	2,358	602	21,028	7,539	1,989	15,711	3,391	2,845	513	55,930	8,542	14,253	22,729	288	749	1,577	217,412
P | Pasture	241		289	578	124	154			6,454	46	716	748	3,834		1,170	6,568	16	2,134	1,705	15,199		6,580	1,465	311		107	48,441
R | Rice																				1,211							1,211
T | Truck, Nursery, And Berry Crops	92	43	1,676	276	155		1,676	215	2,865		909	3	1,122		0	1,613	1,194	2,097	173	14,752		7,185	3,187	733	112	992	41,071
U | Urban		1	98					0	357		233	34	4,254		3	116	1	16		1,292			269	1	0	84	6,757
V | Vineyard			173		881				89		153		26							149			755		192	149	2,565
X | Unclassified	9	710	84	139	353	3	215	49	3,838		1,687	87	1,106		93	739	616	169	52	2,425		749	1,730	159	235	59	15,305
YP | Young Perennial	148		141	22	115	145	523	311	3,665		1,282	23	268		55	1,060	271	896	27	2,135		384	989	213	217	51	12,942
Grand Total	2,084	3,688	11,197	3,484	12,991	2,476	8,938	6,765	100,194	1,972	15,410	3,039	40,485	7,539	8,272	52,521	13,873	16,888	3,615	142,078	8,542	48,186	64,535	4,283	5,158	6,233	594,445

*Land use information was obtained from The California DWR Land Use Viewer https://gis.water.ca.gov/app/CADWRLandUseViewer.

SAMPLING SITE DESCRIPTIONS

A narrative description of each sample site and TMDL compliance site in the WSJWQC is included below. Land use information and a map of the Coalition monitoring locations can be referenced in Table 7 and Figure 1.

Blewett Drain near Highway 132 –Originally called Vernalis at Highway 132, this site is located at the northern boundary of the WSJRWC. The crops in the site watershed include citrus and subtropical fruit, deciduous fruit and nuts, field crops, pasture, truck nursery and berry crops, and unclassified.

Del Puerto Creek @ Highway 33 and Del Puerto Creek near Cox Rd –Del Puerto Creek is on the 303(d) list for pesticides and is a major drainage for the Patterson Subarea and major storm runoff collector. Two stations are located on this waterbody: one near the discharge to the San Joaquin River (Cox Rd), and one at Highway 33, near the middle of the Patterson Subarea. The crops in the site watershed include citrus and subtropical, deciduous fruits and nuts, field crops, grain and hay, pasture, truck nursery and berry crops, urban, vineyard, unclassified, and young perennials.

DMC @ Del Puerto WD –This site monitors water quality in the Delta Mendota Canal at a Del Puerto Water District turnout. This site characterizes the source water quality typical of the Delta Mendota Canal and is monitored for source water constituents. Flow is not measured at this site.

Hospital Creek @ River Rd –This site is a significant drainage for the Patterson Subarea of the Coalition. The crops in the site watershed include citrus and subtropical, deciduous fruits and nuts, field crops, grain and hay, pasture, truck nursery and berry crops, vineyard, unclassified, and young perennials.

Ingram Creek @ River Rd –This site is a significant drainage for the Patterson Subarea of the Coalition. The crops in the site watershed include deciduous fruits and nuts, field crops, grain and hay, pasture, truck nursery and berry crops, unclassified, and young perennials.

Los Banos Creek @ China Camp Rd and Los Banos Creek @ Highway 140 – These sites monitor agricultural and storm runoff from the Los Banos Subarea. There is a farmer-maintained dam downstream of the site at China Camp Rd which is frequently used to stop flows so that it may be diverted for irrigation. The crops in the site watershed include citrus and subtropical fruit, deciduous fruits and nuts, field crops, grain and hay crop, riparian vegetation, pasture, truck nursery and berry crops, urban, vineyard, unclassified, and young perennials.

Marshall Rd Drain near River Rd – This site monitors a pipe drain that carries agricultural and storm runoff from the Patterson Subarea of the Coalition. During periods of high flow, the weir at the site can become submerged and incapable of measuring flow. The crops in the site watershed include citrus and subtropical fruit, deciduous fruits and nuts, field crops, grain and hay, pasture, truck nursery and berry crops, urban, vineyard, unclassified, and young perennials.

Mud Slough u/s San Luis Drain – This site measures drainage originating from the Dos Palos and Los Banos Subareas that flow through the wetlands. This site is used for both the ILRP program and the SWAMP monitoring. The crops in the site watershed include citrus and subtropical fruit, deciduous fruit and nuts, field crops, grain and hay, riparian vegetation, pasture, truck nursery and berry crops, urban, unclassified, and young perennials.

Newman Wasteway near Hills Ferry Rd –This site captures drainage that originates from the southerly region of the Patterson Subarea. The crops in the site watershed include citrus and subtropical fruit, deciduous fruits and nuts, field crops, grain and hay, pasture, truck nursery and berry crops, unclassified, and young perennials.

Orestimba Creek @ Farm Bridge – Orestimba Creek is similar to Del Puerto Creek in both the surrounding landscape and discharged water quality. It is a major drainage for the Patterson Subarea and is included in the biological assessment portion of the monitoring program. The crops in the site watershed include citrus and subtropical, deciduous fruits and nuts, field crops, grain and hay, pasture, truck nursery and berry crops, unclassified, and young perennials.

Poso Slough @ Indiana Ave – This site is located on Poso Slough near the boundary between San Luis Canal Company and Central California Irrigation District in the Dos Palos Subarea of the Coalition. Poso Slough is a tributary to Salt Slough, discharging upstream of the Sand Dam monitoring site. The crops in the site watershed include citrus and subtropical, deciduous fruits and nuts, field crops, grain and hay, riparian vegetation, pasture, rice, truck nursery and berry crops, urban, vineyard, unclassified, and young perennial.

Ramona Lake near Fig Ave – This site monitors discharge from a small lake as it flows into the San Joaquin River. Agricultural and storm runoff from the Patterson Subarea can discharge into the lake. The crops in the site watershed include deciduous fruits and nuts, field crops, grain and hay, pasture, truck nursery and berry crops, unclassified, and young perennials.

Salt Slough @ Lander Ave and Salt Slough @ Sand Dam–Salt Slough captures agricultural, storm, and wetland runoff from the Dos Palos and Los Banos Subareas. The Lander Ave site is used in conjunction for both the ILRP program and the SWAMP program. The crops in the site watershed include citrus and subtropical, deciduous fruits and nuts, field crops, grain and hay, riparian vegetation, pasture, rice, truck nursery and berry crops, urban, vineyard, unclassified, and young perennial.

San Joaquin River @ Lander Ave – This site is both a receiving waterbody for agricultural and storm drainage and a source water for districts that pump from the San Joaquin River. It also receives drainage flows from irrigated wetlands in the fall and winter months. The crops in the watershed include deciduous fruits and nuts, field crops, grain and hay, riparian vegetation, pasture, truck nursery and berry crops, unclassified, and young perennials.

SJR @ PID Pumps – This is a source water monitoring site is located at the Patterson Irrigation District pump station on the San Joaquin River and characterizes the source water quality of the San Joaquin River in the Patterson Subarea. This site is the same as the San Joaquin River at Las Palmas site listed in the Chlorpyrifos and Diazinon TMDL program.

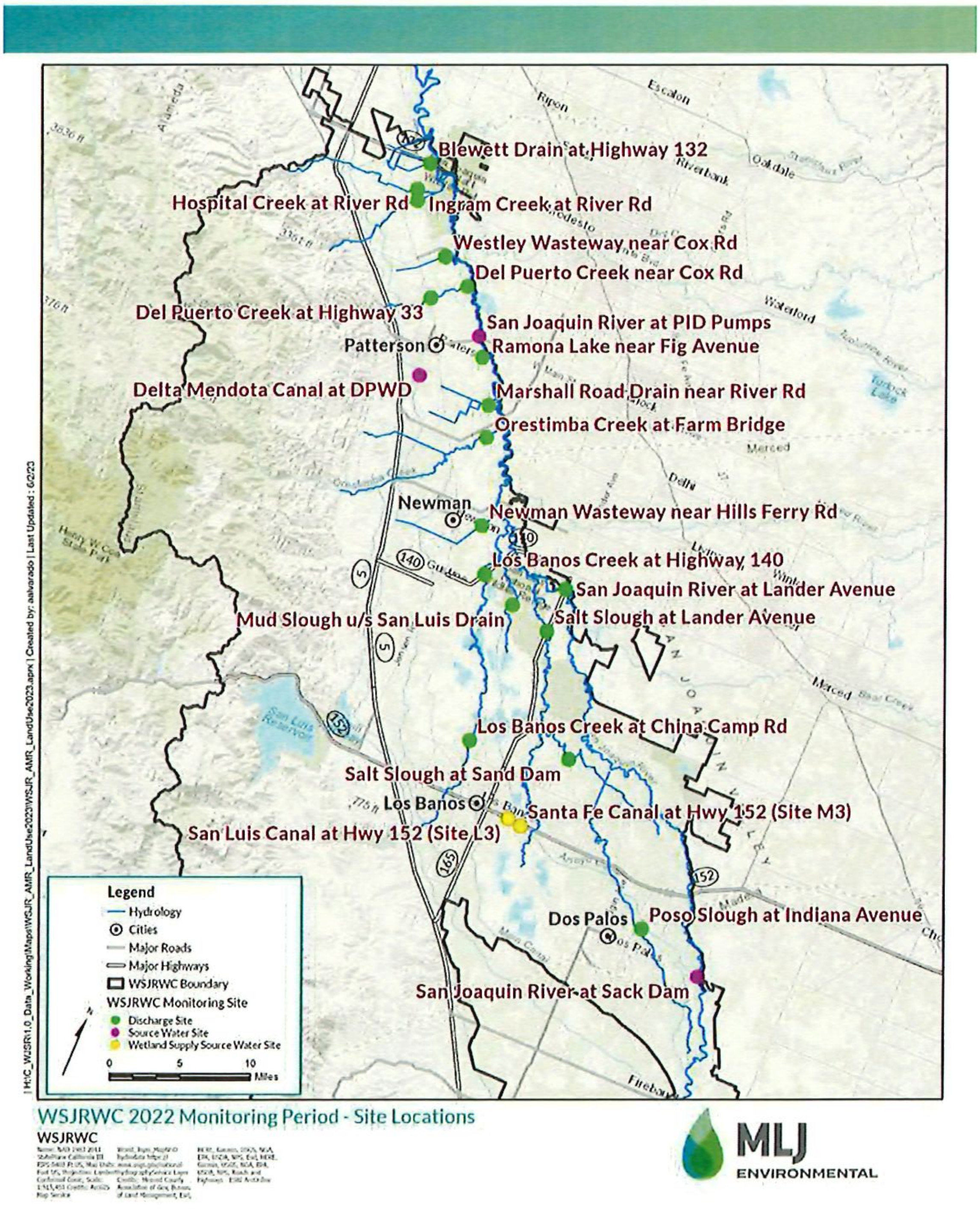
San Joaquin River @ Sack Dam – This is a source water monitoring site located at the diversion point for San Luis Canal Company and characterizes the source water quality of the San Joaquin River in the Patterson Subarea.

San Luis Canal Upstream of Splits – This is a source water monitoring site for wetlands within the WSJRWC. The site is exclusively monitored for boron and selenium.

Santa Fe Canal 150' North of SLC & SFC Intersection – This is a source water monitoring site for wetlands within the WSJRWC. The site is exclusively monitored for boron and selenium.

Westley Wasteway near Cox Rd – Westley Wasteway is a significant drainage for the Patterson Subarea for both tailwater and storm runoff. Land use upstream of this monitoring station is like that of Del Puerto Creek. The crops in the site watershed include citrus and subtropical, deciduous fruits and nuts, field crops, grain and hay, pasture, truck nursery and berry crops, vineyard, unclassified, and young perennials.

Figure 1. WSJRWC Monitoring Locations.



RAINFALL RECORDS

In the WSJRWC region, a storm monitoring event is triggered when enough rainfall has occurred to cause most of the flow at a monitoring site to consist of rain runoff. This determination is made by field sampling crews on a site-by-site basis. Stormwater monitoring criteria must be identified based on precipitation levels and knowledge of soils or other factors affecting when stormwater runoff is expected. Storm monitoring events must be captured at least twice a year provided enough rainfall occurs. Samples collected during rain events are analyzed for all the Assessment Monitoring constituents.

The Coalition may not capture every storm event due to the following reasons, 1) sample dates and laboratory analyses could not be moved to coincide with expected rainfall runoff, 2) monitoring schedules were not changed to capture the storm because the amount of precipitation was not predicted to cause the majority of flow at a site, 3) there was no evidence of runoff due to a lack of moisture in the soils, or 4) a storm event was already captured for the month.

From March 1, 2022, through February 28, 2023, the Coalition sampled two storm events (November 9, 2022 and December 5, 2022; Table 8).

Figure 2 and Figure 3 provide daily rainfall records from March 1, 2022 through February 28, 2023 for the California Irrigation Management Information System (CIMIS) weather stations in Firebaugh, Modesto and Panoche. Data from July 1, 2022 through August 31, 2022 are not included as there was no significant rainfall that occurred in the Coalition region during this time frame. The CIMIS station identification numbers are 007 for Firebaugh, 071 for Modesto, and 124 for Panoche. The amount of precipitation associated with the storm event from the 2022 Monitoring Period is included in Table 8.

Table 8. WSJRWC 2022 Monitoring Period precipitation amounts for Storm Sampling events.

Precipitation calculations are for the accrued amount of precipitation (in inches) before sampling occurred.

SAMPLE DATE	PRECIPITATION (INCHES)		
	Firebaugh	Modesto	Panoche
11/9/2022	0.53	0.70	0.52
12/5/2022	0.65	1.26	0.58

Figure 2. Precipitation history for the WSJRWC Region, March 1, 2022 through June 30, 2022.
All weather data reported on https://cimis.water.ca.gov.

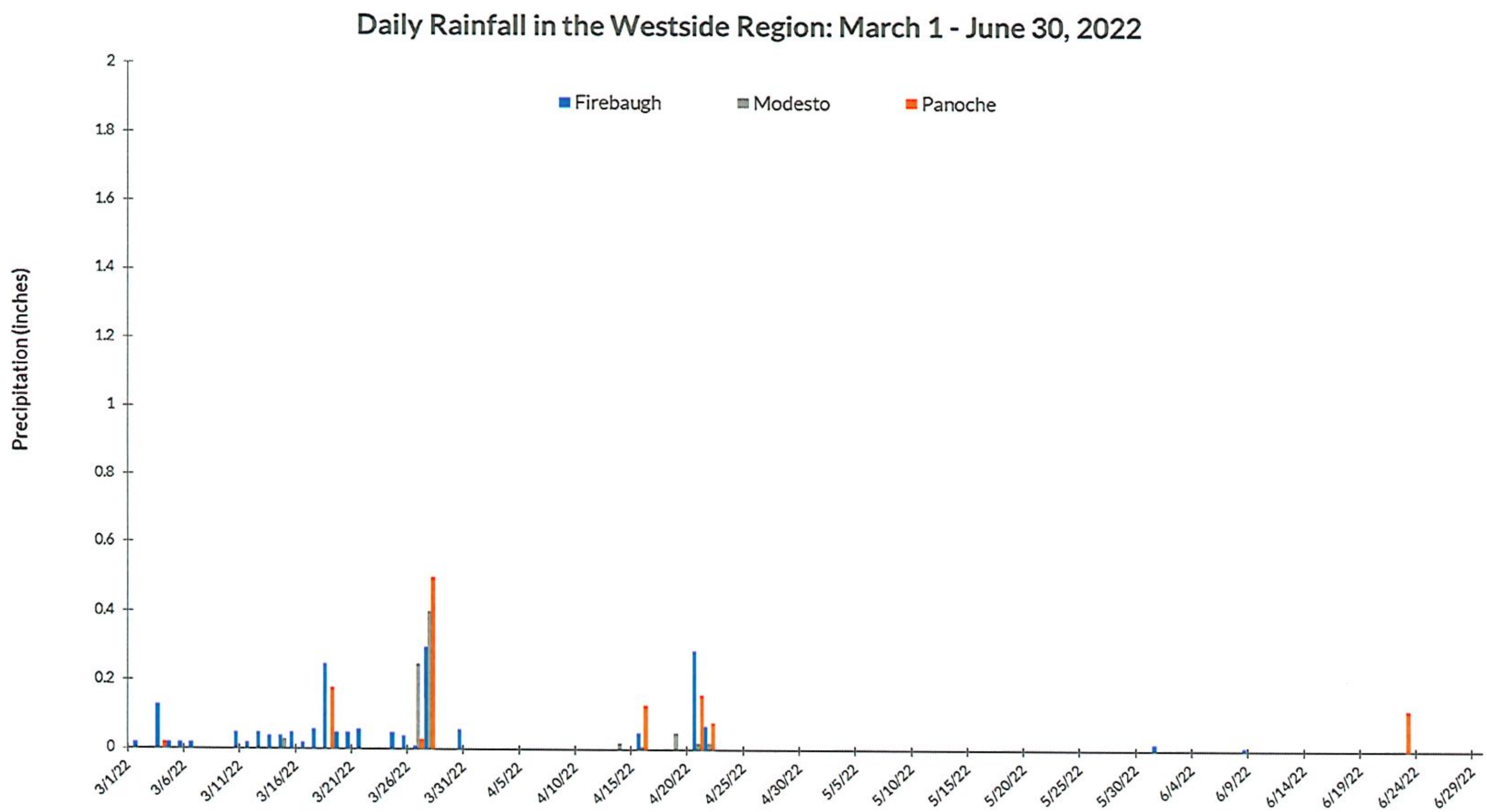
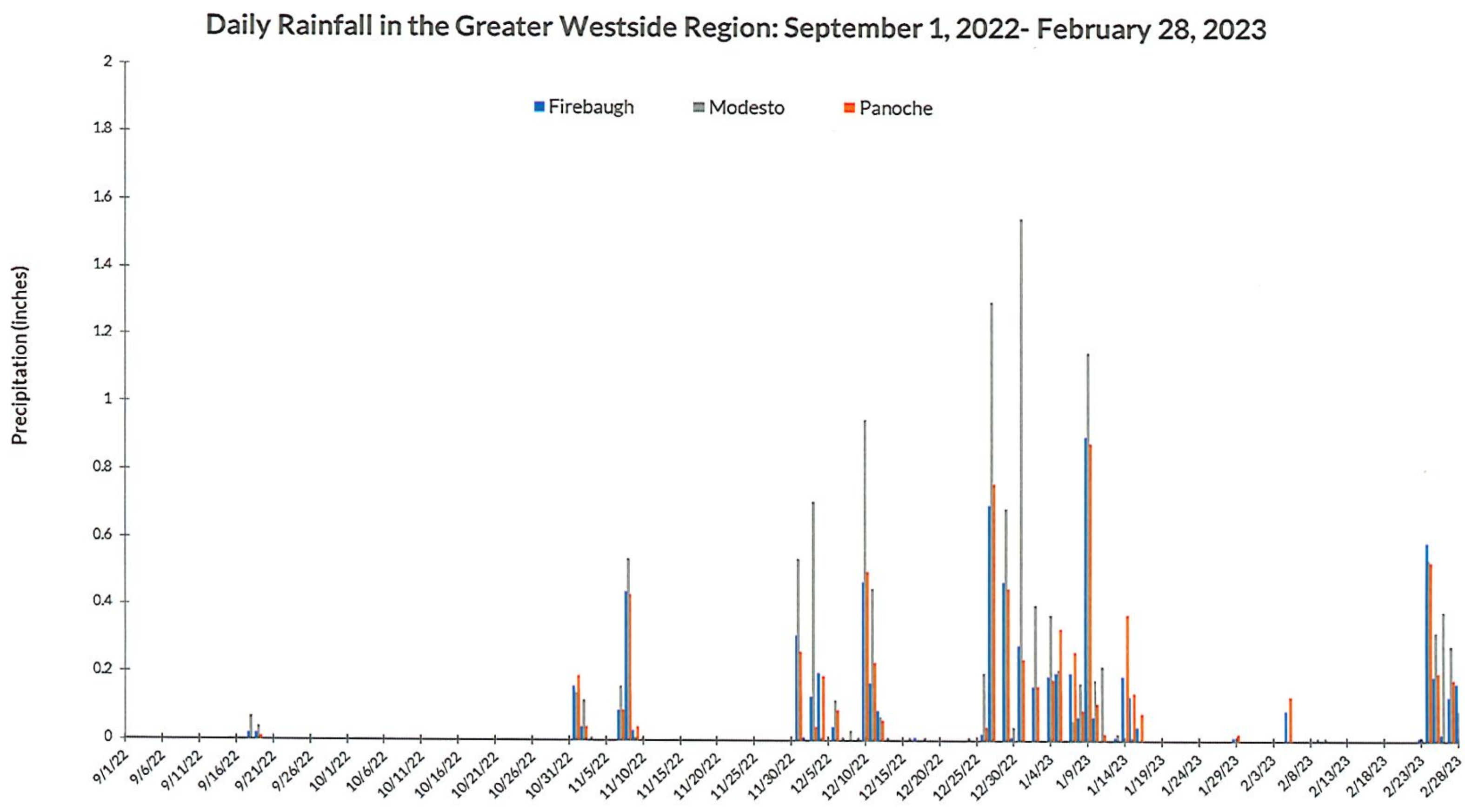


Figure 3. Precipitation history for the WSJRWC Region, September 1, 2022 through February 28, 2023.
All weather data reported on https://cimis.water.ca.gov.



METHODS

The sections below describe the sampling, analytical, and sourcing methods utilized during the 2022 Monitoring Period.

SAMPLING METHODS

Sample containers, volumes, and holding times are provided in Table 9. Table 10 lists the instruments used to measure field parameters and Table 11 references methods and equipment used to measure discharge.

Discharge was calculated at most sites using flow measurements from the float method (i.e., a measurement tape is placed along the bank and the flow rate is estimated based on timing the distance that a piece of floating debris moves over a measured distance) and stream width and depth measurements.

Data from California Data Exchange Center (CDEC) and United State Geologic Survey (USGS) gauging stations are also used to determine discharge. Discharge volumes are recorded from the CDEC and USGS stations for Mud Slough Upstream of San Luis Drain, Salt Slough at Lander Avenue, San Joaquin River at Lander Avenue, and San Joaquin River at Sack Dam.

Table 9. Sample container, volume, and holding times for collection.

Groups	Analytical Parameter	Sample Volume[1]	Sample Container	Initial Preservation/Holding Requirements	Holding Time[2]
Physical Parameters	Total Suspended Solids	2000 mL	1x 2000 mL polyethylene	Store at <6°C	48 hours
	Turbidity				
	Total Dissolved Solids				
	Soluble Orthophosphate				
	Bromide				
Nutrients	Ammonia and Nitrate-Nitrite as N	500 mL	1x 500 mL polyethylene	Store at <6°C, preserve to pH ≤ 2 with H_2SO_4	28 days
	TKN				
	Total Phosphorus				
	Orthophosphate	Sample collected in bottle with physical parameters.			
Metals	Metals/Trace Elements	500 mL	1x 500 mL polyethylene	Filter as necessary; store at <6°C, preserve to ≤pH 2 with HNO_3	40 days
Drinking Water	*E. coli* (pathogens)[3]	125 mL	1x 150 mL polyethylene	Store at <6 °C	24 hours
	Total Organic Carbon	120 mL	3x 40 mL amber glass VOA with PTFE-lined cap	Preserve with HCl, store at <6°C	28 days
Pesticides	Carbamates	1 L	1L amber glass Jar	Store at <6°C; extract within 7 days	40 days
	Herbicides	1 L	1L amber glass Jar		
	Organophosphates	1 L	1L amber glass Jar		
	Organchlorines	1 L	1L amber glass Jar		
Toxicity	Aquatic Toxicity	5 gallons	5 x 1 gallon amber glass jar	Store at <6°C	36 hours
	Sediment Toxicity	2 L	2x 1L clear glass jar	Store at <6°C, do not freeze	14 days

Groups	Analytical Parameter	Sample Volume[1]	Sample Container	Initial Preservation/Holding Requirements	Holding Time[2]
Sediment Analysis	Sediment Grain Size	500 mL	Glass	Store at <6°C, do not freeze	28 days
	Sediment Total Organic Carbon	500 mL	Glass	Store at <6°C	28 days
	Sediment Chemistry	500 mL	Glass	Frozen	12 months
	Sediment Total Solids	250 mL	1x 250 mL Glass Jar	Store at <6°C	7 days

[1] Additional volume may be required for Quality Control (QC) analyses. The sample volume listed for aquatic toxicity represents the volume collected for a single species.

[2] Holding time is after initial preservation or extraction.

[3] Samples for *E. coli* analyses are set up as soon as possible.

Table 10. Field parameters and instruments used to collect measurements.

Parameter	Instrument
Dissolved Oxygen	YSI Model 556
Temperature	YSI Model 556
pH	YSI Model 556
Specific Conductance	YSI Model 556
Flow	Float method

YSI- Yellow Springs Instruments.

Table 11. Site specific discharge methods.

Sites organized alphabetically.

Site	Discharge Method[1]	Meter/ Gauge
Discharge Sites		
Blewett Drain at Highway 132	USGS R2Cross Streamflow Method	Float
Del Puerto Creek at Highway 33	USGS R2Cross Streamflow Method	Float
Del Puerto Creek near Cox Road	USGS R2Cross Streamflow Method	Float
Hospital Creek at River Road	USGS R2Cross Streamflow Method	Float
Ingram Creek at River Road	USGS R2Cross Streamflow Method	Float
Los Banos Creek at China Camp Road	USGS R2Cross Streamflow Method	Float
Los Banos Creek at Highway 140	USGS R2Cross Streamflow Method	Float
Marshall Road Drain near River Road	USGS R2Cross Streamflow Method	Float
Mud Slough Upstream of San Luis Drain	Discharge from CDEC station[2]	Mud Slough NR Gustine
Newman Wasteway near Hills Ferry Road	USGS R2Cross Streamflow Method	Float
Orestimba Creek at Farm Bridge	USGS R2Cross Streamflow Method	Float
Poso Slough at Indiana Ave	USGS R2Cross Streamflow Method	Float
Ramona Lake near Fig Avenue	USGS R2Cross Streamflow Method	Float
Salt Slough at Lander Ave	Discharge from CDEC station[2]	Salt Slough at Hwy 165 NR Stevinson
Salt Slough at Sand Dam	USGS R2Cross Streamflow Method	Float
San Joaquin River at Lander Ave	Discharge from CDEC station[2]	San Joaquin River Near Stevinson
Westley Wasteway near Cox Road	Discharge from CDEC station[2]	Float
Source Water Sites		
Delta Mendota Canal at DPWD	USGS R2Cross Streamflow Method	Float
San Joaquin River at PID Pumps	USGS R2Cross Streamflow Method	Float
San Joaquin River at Sack Dam	Discharge from CDEC station[2]	San Joaquin R NR Dos Palos
Special Monitoring Sites- Wetland Source Water Sites		
San Luis Canal @ Hwy 152	USGS R2Cross Streamflow Method	Float
Santa Fe Canal @ Hwy 152	USGS R2Cross Streamflow Method	Float

[1]USGS R2 Cross Streamflow Method is only conducted when wading in stream is safe. Observed flow is recorded for every site.

[2]Discharge from CDEC station retrieved from website (http://cdec.water.ca.gov).

Sample Collection Details

Surface water monitoring results, sample locations, sampling dates, sampling times, and type of monitoring are included in Attachment A. Results are provided for field parameters, organics (pesticides), inorganic constituents, including metals, nutrients, and *E. coli*, toxicity (water and sediment), and sediment chemistry. Monitoring data include results from samples taken from Discharge Sites, Source Water Sites, Wetland Supply Channel Sites, sediment monitoring, and TMDL compliance monitoring.

The Quality Assurance Project Plan (QAPP) and QAPP Amendment for field sampling procedures ensure the Coalition is collecting the highest quality and most representative samples for the waterbody (approved April 12, 2017). The Coalition is required to sample every site scheduled for monitoring, as outlined in the 2022 MPU; however, certain field conditions can prevent samples from being collected.

Table 12 lists the sampling conditions that can occur and the exceptions that result in no sample collection.

Table 12. Description of field sampling conditions and monitoring decisions.
If samples are unable to be collected, the sampling event is considered "Dry".

Sampling Conditions	Definition	Sampling Exceptions	Collect Water Samples?	Collect Sediment Samples?
Contiguous	Waterbody connected upstream and downstream of the sample site.	None: enough water to collect required samples.	Yes	Yes
		Too Shallow: waterbody is <6 inches deep.	No	Yes
		Hard Bottom: no sediment present or hardpan sediment only.	Yes	No
Non-contiguous	Waterbody not connected upstream or downstream of the sample site.	None: water is noncontiguous with other noncontiguous sections of water within view of the sample location and there is enough volume present to collect required samples.	Yes	Yes
		Too Shallow: waterbody is puddled and <6 inches deep.	No	Yes
		Hard Bottom: no sediment present or hardpan sediment only.	Yes	No
Dry	No water present or not enough volume present to collect required samples.	None: Sediment has enough moisture to collect required samples.	No	Yes
		Dry: no water present or not enough volume present to collect required samples.	No	No

ANALYTICAL METHODS

Analytical methods and reporting limits (RLs) are provided in Table 13. All field sampling and analytical methods are performed as outlined in the Standard Operating Procedures (SOPs) provided in the QAPP. Any deviations from these procedures are documented in the 'Quality Assurance Evaluation Results' section of this report.

Table 13. Field and laboratory analytical methods.

Group	Constituent	Matrix	Analyzing Laboratory	Reporting Limit	Minimum Detection Limit	Analytical Method
Physical Parameters	Discharge	Fresh Water	Field Measure	1 cfs	NA	Site Dependent[1]
	pH	Fresh Water	Field Measure	0.1 pH units	NA	EPA 150.1
	DO	Fresh Water	Field Measure	0.1 mg/L	NA	SM 4500-O
	SC	Fresh Water	Field Measure	100 µS/cm	NA	EPA 120.1
	Temperature	Fresh Water	Field Measure	0.1 °C	NA	SM 2550
	Turbidity	Fresh Water	Caltest	0.07 NTU	0.07 NTU	SM 2130 B
	Total Suspended Solids	Fresh Water	Caltest	3 mg/L	1 mg/L	SM 2540 D
Inorganics	Hardness	Fresh Water	Caltest	5 mg/L	1.7 mg/L	SM 2340 C
	Dissolved Organic Carbon	Fresh Water	Caltest	0.5 mg/L	0.3 mg/L	SM 5310 B
	Total Organic Carbon	Fresh Water	CalTest	0.5 mg/L	0.3 mg/L	SM 5310 B
Bacteria	*E. coli*	Fresh Water	Caltest	1 MPN/100 mL	1 MPN/100 mL	SM 9223 B
Toxicity	Water Column Toxicity	Fresh Water	PER	NA	NA	EPA 821-R-02-012 EPA 821-R-02-012M EPA 821-R-02-013
	Sediment Toxicity	Sediment	PER	NA	NA	EPA 600/R-99-064
Pesticides	Paraquat	Fresh Water	NCL	0.4 ug/L	0.25 ug/L	EPA 549.2M
	Dichlorophenoxybutyric Acid, 2,4-	Fresh Water	NCL	1 ug/L	0.65 ug/L	EPA 615
	Chlorothalonil	Fresh Water	APPL	0.2 ug/L	0.1 ug/L	EPA 8081A
	DDD(p,p')	Fresh Water	APPL	0.01 ug/L	0.003 ug/L	EPA 8081A
	DDE(p,p')	Fresh Water	APPL	0.01 ug/L	0.004 ug/L	EPA 8081A
	DDT(p,p')	Fresh Water	APPL	0.01 ug/L	0.005 ug/L	EPA 8081A
	Oxyfluorfen	Fresh Water	APPL	0.05 ug/L	0.008 ug/L	EPA 8081A
	Chlorpyrifos	Fresh Water	APPL	0.015 ug/L	0.0026 ug/L	EPA 8141A
	Diazinon	Fresh Water	APPL	0.02 ug/L	0.004 ug/L	EPA 8141A
	Dichlorvos	Fresh Water	APPL	0.1 ug/L	0.02 ug/L	EPA 8141A
	Dimethoate	Fresh Water	APPL	0.1 ug/L	0.08 ug/L	EPA 8141A
	Hexazinone	Fresh Water	APPL	0.5 ug/L	0.1 ug/L	EPA 8141A
	Malathion	Fresh Water	APPL	0.1 ug/L	0.05 ug/L	EPA 8141A

Group	Constituent	Matrix	Analyzing Laboratory	Reporting Limit	Minimum Detection Limit	Analytical Method
	Parathion, Methyl	Fresh Water	APPL	0.1 ug/L	0.075 ug/L	EPA 8141A
	Pendimethalin	Fresh Water	APPL	0.1 ug/L	0.041 ug/L	EPA 8141A
	Prometryn	Fresh Water	APPL	0.1 ug/L	0.05 ug/L	EPA 8141A
	Simazine	Fresh Water	APPL	0.5 ug/L	0.08 ug/L	EPA 8141A
	Trifluralin	Fresh Water	APPL	0.05 ug/L	0.04 ug/L	EPA 8141A
	Chloropicrin	Fresh Water	NCL	10 ug/L	6.4 ug/L	EPA 8260BM
	Bifenthrin	Fresh Water	Caltest	0.0005 ug/L	0.0003 ug/L	EPA 625.1_NCI
	Cyfluthrin, total	Fresh Water	Caltest	0.0005 ug/L	0.0004 ug/L	EPA 625.1_NCI
	Cyhalothrin, Total lambda-	Fresh Water	Caltest	0.0005 ug/L	0.0003 ug/L	EPA 625.1_NCI
	Cypermethrin, Total	Fresh Water	Caltest	0.0005 ug/L	0.0003 ug/L	EPA 625.1_NCI
	Esfenvalerate/Fenvalerate, Total	Fresh Water	Caltest	0.001 ug/L	0.0004 ug/L	EPA 625.1_NCI
	Fenpropathrin	Fresh Water	Caltest	0.0005 ug/L	0.0004 ug/L	EPA 625.1_NCI
	Permethrin, Total	Fresh Water	Caltest	0.005 ug/L	0.002 ug/L	EPA 625.1_NCI
	Carbaryl	Fresh Water	APPL	0.07 ug/L	0.05 ug/L	EPA 8321A
	Diuron	Fresh Water	APPL	0.2 ug/L	0.05 ug/L	EPA 8321A
	Imidacloprid	Fresh Water	APPL	0.2 ug/L	0.05 ug/L	EPA 8321A
	Linuron	Fresh Water	APPL	0.2 ug/L	0.05 ug/L	EPA 8321A
	Methomyl	Fresh Water	APPL	0.07 ug/L	0.05 ug/L	EPA 8321A
	Clothianidin	Fresh Water	NCL	0.02 ug/L	0.0038 ug/L	NCL ME 340
	Cyprodinil	Fresh Water	NCL	0.02 ug/L	0.0031 ug/L	NCL ME 340
	Pyraclostrobin	Fresh Water	NCL	0.02 ug/L	0.0034 ug/L	NCL ME 340
Metals	Arsenic (Total)	Fresh Water	Caltest	0.5 ug/L	0.06 ug/L	EPA 200.8
	Boron (Total)	Fresh Water	Caltest	10 ug/L	2 ug/L	EPA 200.8
	Cadmium (Dissolved)	Fresh Water	Caltest	0.1 ug/L	0.05 ug/L	EPA 200.8
	Copper (Dissolved)	Fresh Water	Caltest	0.5 ug/L	0.36 ug/L	EPA 200.8
	Lead (Dissolved)	Fresh Water	Caltest	0.25 ug/L	0.07 ug/L	EPA 200.8
	Molybdenum (Total)	Fresh Water	Caltest	0.5 ug/L	0.4 ug/L	EPA 200.8
	Nickel (Dissolved)	Fresh Water	Caltest	0.5 ug/L	0.06 ug/L	EPA 200.8
	Selenium (Total)	Fresh Water	Caltest	1 ug/L	0.4 ug/L	EPA 200.8
	Zinc (Total)	Fresh Water	Caltest	1 ug/L	0.7 ug/L	EPA 200.8

Group	Constituent	Matrix	Analyzing Laboratory	Reporting Limit	Minimum Detection Limit	Analytical Method
Nutrients	Nitrate + Nitrite as N	Fresh Water	Caltest	0.05 mg/L	0.04 mg/L	EPA 353.2
	OrthoPhosphate as P	Fresh Water	Caltest	0.01 mg/L	0.004 mg/L	SM 4500-P E v21,22
	Ammonia as N	Fresh Water	Caltest	0.1 mg/L	0.04 mg/L	SM 4500-NH3 BC v22
Sediment	Bifenthrin	Sediment	Caltest	0.33 ng/g dw[3]	0.05 ng/g dw[3]	EPA 8270M_NCI
	Chlorpyrifos	Sediment	Caltest	0.33 ng/g dw[3]	0.12 ng/g dw[3]	EPA 8270M_NCI
	Cyfluthrin, total	Sediment	Caltest	0.33 ng/g dw[3]	0.02 ng/g dw[3]	EPA 8270M_NCI
	Cypermethrin, Total	Sediment	Caltest	0.33 ng/g dw[3]	0.03 ng/g dw[3]	EPA 8270M_NCI
	Deltamethrin/Tralomethrin	Sediment	Caltest	0.33 ng/g dw[3]	0.05 ng/g dw[3]	EPA 8270M_NCI
	Esfenvalerate/Fenvalerate, Total	Sediment	Caltest	0.33 ng/g dw[3]	0.08 ng/g dw[3]	EPA 8270M_NCI
	Fenpropathrin	Sediment	Caltest	0.33 ng/g dw[3]	0.03 ng/g dw[3]	EPA 8270M_NCI
	Cyhalothrin, Total lambda-	Sediment	Caltest	0.33 ng/g dw[3]	0.02 ng/g dw[3]	EPA 8270M_NCI
	Permethrin, Total	Sediment	Caltest	0.33 ng/g dw[3]	0.18 ng/g dw[3]	EPA 8270M_NCI
	Piperonyl Butoxide	Sediment	Caltest	0.33 ng/g dw[3]	0.22 ng/g dw[3]	EPA 8270C SIM
	Total Organic Carbon	Sediment	Caltest[2]	500 mg/Kg dw	200 mg/Kg dw	EPA 9060[4]
	Grain Size	Sediment	Caltest[2]	0.01%	0.01%	Plumb, 1981, GS

CFS- Cubic Feet per Second
MPN- Most Probable Number
NA- Not applicable

[1] The "float method" is used for most sites. Alternatively, data will be obtained online for sites with gauging stations or rated weirs.

[2] Subcontracted to SCL Laboratory

[3] RL and MDL adjust as per the percent solids. RL and MDL's reflect wet weight analysis and are not converted for percent solids or dry weight reporting.

[4] Some events analyzed by Caltest using EPA method 9060M.

SOURCING METHODS

If there is an exceedance of a WQTL for a chemical constituent or toxicity occurs, the Coalition attempts to source and identify 1) the location of the applications of the product containing the constituent (Pesticide Use Report (PUR) data), and 2) the chemical and class of the toxicant in the sample (Toxicity Identification Evaluations (TIE) and additional sediment chemistry).

Pesticide Use Report Data

The Coalition retrieves PUR data from each of the County Agricultural Commissioner's offices and are considered preliminary; the PUR data become final when released by DPR to California Pesticide Information Portal (CalPIP). Preliminary PUR data are uploaded to a relational database maintained by the Coalition and associated with exceedances of WQTLs based on Active Ingredients (AIs). The database links registered products to AIs and calculates pounds (lbs) of AIs applied per acre based on the use reported by growers.

Registered products are evaluated for applications relevant to exceedances of WQTLs. To assess possible sources of toxicity, applications of pesticides known to be toxic to the test species are identified based on a variety of factors including the organic carbon partitioning coefficient (K_{oc}), chemical type, mode of action, and solubility. If water column toxicity occurs, pesticides with a K_{oc} below 1900 are considered potential causes and the PUR database is queried for pesticides applied within 30 days prior to water sampling. If sediment toxicity occurs, pesticides with a K_{oc} of 1600 or greater are considered potential causes and the PUR database is queried for applications within 90 days prior to the date of toxicity.

The PUR database is queried for applications of pyrethroids within 180 days prior to the date of sediment toxicity (sediment toxicity) due to the longer half-life of pyrethroids in sediment. The database is queried for applications of metals within 90 days prior to exceedances (Table 14). If no applications can be linked to the exceedance or toxicity in the specified time period, the PUR database is queried to identify applications made an additional 30 days prior to the time period. The PUR data are then mapped to determine if the applications occurred in the relevant direct drainage area of the watershed and within 200 yards of the waterbody.

The PUR database cannot be queried for applications of chemicals and metals that are not applied by agriculture (aldrin, dieldrin, endrin, hexachlorocyclohexane (HCH), DDD, DDE, DDT, arsenic, lead, or molybdenum) since there are no registered products containing these chemicals.

Table 14. Timeframes for associating PUR data with exceedances of pesticides, metals, sediment, and water column toxicity.

EXCEEDANCE TYPE	PUR DATA TIMEFRAMES
Pesticides (except pyrethroids)	30 days
Metals	90 days
Pyrethroids	180 days
Sediment Toxicity	90 days with 180 days for pyrethroids
Water Column Toxicity	30 days with 180 days for pyrethroids and 90 days for metals

All PUR data associated with 2022 Monitoring Period exceedances are included in Attachment B. Information about PUR data obtained for the 2022 Monitoring Period is included in Table 15.

Preliminary data may include zeroes or blank cells in the pounds AI per acre column of the PUR appendix (Attachment B). Preliminary data do not include the pounds of AI per acre and therefore it must be calculated based on the amount applied and area reported. Accurate calculations require proper units for AI applied and area treated; if preliminary data contain errors in the amount applied, these calculations cannot be performed, and the result is a blank cell for AI per acre. Values recorded as 'zero' in the pounds AI per acre column are due to values less than 0.0001 being rounded to zero during the calculation process; this occurs when the amount of chemical applied to an acre is extremely small. The original data are not rounded; pounds AI per acre derived from calculations are the only rounded values.

Table 15. Obtained PUR data for 2022 Monitoring Period exceedances.
The PUR data for this report are through May 17, 2023.

COUNTY	2022 MONITORING PERIOD PUR DATA OBTAINED	2022 MONITORING PERIOD PUR DATA OUTSTANDING
Fresno	March 2022 through March 2023	Complete
Madera	March 2022 through February 2023	Complete
Merced	March 2022 through March 2023	Complete
San Joaquin	March 2022 through December 2022	Incomplete
Stanislaus	March 2022 through March 2023	Complete

Toxicity Identification Evaluations

Toxicity in samples collected in the Coalition region is primarily caused by pesticides and cationic metals. The Coalition performs TIEs on water samples when survival or growth of the target organism is 50% or less compared to the control. The goal of the TIEs is to identify the chemical class of toxicant(s) in the test sample. Based on the responses to manipulations of the sample performed during the TIE, the cause(s) of toxicity can be categorized into broad chemical classes, e.g. nonpolar organics in general, pyrethroids or organophosphates specifically, and cationic metals.

A Phase III TIE is performed to further associate the concentrations of constituents present in the samples exhibiting toxicity. A Phase III TIE can only be performed if chemistry data are collected in conjunction with toxicity sampling. The Phase III TIE results can be analyzed to determine the toxic units (TUs) in the sample. When TIEs are conducted, the samples may lose toxicity, and therefore, TIEs are not able to identify the class of compound responsible for the toxicity.

Sediment Chemistry Analysis

Sediment samples are analyzed for the presence of pyrethroids, piperonyl butoxide (PBO), and chlorpyrifos when toxicity to *H. azteca* occurs and survival in the ambient sample is less than 80% compared to the control. Pyrethroids readily bind to organic matter, sediment, and a small portion of the chemical partitions into pore water becoming bioavailable to *H. azteca*. The additional sediment chemistry results are used to determine if sediment-bound pyrethroids and chlorpyrifos were bioavailable at concentrations that would cause toxicity.

SURFACE WATER QUALITY ASSURANCE EVALUATION RESULTS

The sections below include an assessment of the completeness, precision, and accuracy for data generated from samples collected during the 2022 Monitoring Period. Precision, accuracy, and completeness are evaluated based on Measurement Quality Objectives (MQOs) as outlined in the QAPP. Table 16 through Table 18 include counts and percentages for completeness per method and analyte for the 2022 Monitoring Period. Table 28 includes a summary of holding time evaluations and Table 19 through Table 29 include counts of each measure of precision and accuracy evaluated. All flagged data (did not meet MQOs) are reviewed for overall quality on batch and sample levels and assessed for usability. Ninety percent of the samples collected and analyzed must meet the acceptability criteria. This section details the instances when MQOs were not met for at least 90% of the samples and includes rationale for accepting the data.

All results that do not meet MQOs are flagged using California Environmental Data Exchange Network (CEDEN) codes. The Coalition works with the Central Valley Regional Data Center (CV RDC) to ensure all data are CEDEN comparable. Data generated for the 2022 Monitoring Period are included in Attachment A of this report.

COMPLETENESS

Completeness is assessed on three levels: field and transport, analytical, and batch completeness. Field and transport completeness is based on the number of samples successfully collected and transported to the appropriate laboratories. Field and transport completeness may be less than 100% due to bottle breakage during sample transport to the laboratory or inability to access a site. Waterbodies that lack enough water to collect samples (e.g., dry, non-contiguous, or stagnant) are considered "sampled" and are counted towards field and transport completeness. Analytical completeness is based on the number of samples successfully analyzed by the laboratory. Analytical completeness may be less than 100% due to bottles breaking while at the laboratory or if an analysis failed or was not performed due to laboratory error. Batch completeness assesses whether chemistry and toxicity batches were processed with the required QC samples as prescribed by the QAPP.

Field and Transport Completeness

Overall field and transport completeness for environmental samples was 96.6% for the 2022 Monitoring Period (Table 16). Field crews could not gain access to six sites during the 2022 Monitoring Period. Samples could not be collected during the January 10, 2023 monitoring event from Ramona Lake near Fig Avenue, Salt Slough at Sand Dam, Newman Wasteway near Hills Ferry Road, Del Puerto Creek at Highway 33, and Westley Wasteway near Cox Road due to undrivable roads, road closures, unsafe conditions, or a locked gate restricting access. Samples could not be collected during the December 5, 2022 monitoring event due to the presence of a trench obstructing the collection area. Overall, field and transport completeness requirements were met in 90% of the samples scheduled for the 2022 Monitoring Period except for 2,4-

dichlorophenoxybutyric acid (34 of 38, 89.5%), oxyfluorfen (56 of 63, 88.9%), pendimethalin (27 of 31, 87.1%, linuron (0 of 1, 0.0%).

Field crews could not gain access to the Mud Slough Upstream of San Luis Drain site during the November, December, and January monitoring events. Field crews were instructed to collect at a nearby location that allowed ingress and was representative of the Mud Slough waterbody. Due to an oversight in sampling coordination, field crews collected samples from the Santa Fe Canal instead of Mud Slough. Once the error was discovered, the Coalition created a new site in CEDEN, Santa Fe Canal at Gun Club Road, to associate all incorrectly collected data.

Field parameter measurements (DO, pH, SC, and water temperature) were taken at each site for all sampling events when there was enough water for sample collection. Due to a probe failure, missed recordings, and the inaccessible sites discussed above, completeness for DO (227 of 254, 89.4%), pH (228 of 254, 89.8%), SC (227 of 254, 89.4%), and water temperature (228 of 254, 89.8%) measurements were each less than 90%; overall field measurement completeness was 89.8% for all field parameters (Table 17).

The probe used by field crews to collect pH, DO, SC, and water temperature measurements failed during the August 9, 2022 and the February 14, 2023 monitoring events. Of the 20 sites sampled during each event, field measurements from eight sites during the August 9 event and from nine sites during the February 14 event could not be measured. Sites affected were Los Banos Creek @ Hwy 140, Los Banos Creek at China Camp Road, Mud Slough Upstream of San Luis Drain, Newman Wasteway near Hills Ferry Road, Poso Slough at Indiana Ave, Salt Slough @ Lander Avenue, Salt Slough at Sand Dam, San Joaquin River at Lander Avenue, and SJR @ Sack Dam. See Corrective Actions for more information.

Discharge is either measured by sampling crews or obtained from gauge stations (Table 11). Field and transport completeness is only assessed for discharge where sampling crews collect the measurement. When a waterbody has no measurable flow or is non-contiguous, discharge is recorded as 0 cfs and is counted toward the total number of measurements taken for discharge completeness (Table 17). When samples are only collected for toxicity at a location, discharge is not measured because an instantaneous load does not apply to toxicity; these situations do not count toward the total number of samples scheduled when assessing discharge field and transport completeness (Table 17). Twenty discharge measurements were not collected during the 2022 Monitoring Period. Of the 20 missed measurements, eight were not collected due to instrument failures during the August 9, 2022 monitoring event, six were not collected due to site inaccessibility, and six were not recorded by field crews during the March 8, 2022, April 12, 2022, and December 5, 2022 monitoring events. Completeness for discharge was 90.9% for the 2022 Monitoring Period (Table 17).

Field duplicate and field blank samples are collected by sampling crews in the field and transported to the laboratories. These field QC samples are collected during each event, as prescribed by the QAPP. Each type of field QC must be analyzed at the rate of one per event and at least 5% of all samples collected for a given analyte during the monitoring period. During the 2022 Monitoring Period a field duplicate and field blank were collected for each event, when applicable. Field QC samples were collected at a frequency greater than 5% for all constituents during the 2022 Monitoring Period with frequency percentages ranging from 6.2% to 100% (Table 18).

Analytical Completeness

During the 2022 Monitoring Period, all samples submitted to a laboratory were analyzed. Overall, analytical completeness was 100% (Table 16).

Batch Completeness

Each chemistry and toxicity batch must be processed with a minimum set of QC samples as prescribed in the QAPP. Batch completeness is determined based on whether or not all required QC samples were run with every batch. Chemistry and toxicity batches met batch completeness requirements in 99.4% (334 of 336) of the batches analyzed during the 2022 Monitoring Period.

The matrix spike (MS) samples requested with the batch analyzed for oxyfluorfen during the January 10, 2023 monitoring event were inadvertently omitted from the batch due to laboratory oversight. The initial analysis for the batch included the appropriate QC samples but due to low surrogate recovery the batch was reanalyzed. When reanalysis was performed, the MS sample was mistakenly excluded, but results were accepted due to observed higher concentrations of oxyfluorfen. This batch included samples collected from Blewett Drain at Highway 132, Los Banos Creek @ Hwy 140, Marshall Road Drain near River Road, and Poso Slough at Indiana Ave. The reanalysis was accepted because all laboratory QC samples and surrogates met MQOs and due to higher detections in the environmental samples; all oxyfluorfen data are considered usable.

The MS samples requested with the batch analyzed for dissolved organic carbon during the June 14, 2022 monitoring event were inadvertently omitted from the batch due to laboratory oversight. Only a laboratory blank and LCS/LCSD were analyzed with the environmental sample collected from Blewett Drain at Highway 132 in the batch. The batch was accepted based on the recovery of the LCS (101%) and LCSD (100%) samples and all dissolved organic carbon data are considered useable.

Hold Time and Preservation Compliance

Each sample must be stored, extracted (if applicable), and analyzed within a specific timeframe to meet hold time requirements as outlined in the QAPP (Table 28). Results associated with hold time violations are flagged in the database.

The overall hold time compliance was 99.6% for the 2022 Monitoring Period. Analytes that did not meet hold time criteria include (the numbers in parentheses reflect the count of samples that met hold time):

2,4-dichlorophenoxybutyric acid (49 of 51, 96.1%);
Ceriodaphnia dubia (76 of 81, 93.8%);
chlorothalonil (45 of 48, 93.8%);
DDD(p,p') (68 of 71, 95.8%);
DDE(p,p') (68 of 71, 95.8%);

DDT(p,p') (68 of 71, 95.8%);
diuron (79 of 80, 98.8%);
E. coli (218 of 219, 99.5%);
oxyfluorfen (74 of 78, 94.9%).

The environmental and MS samples analyzed for 2,4-dichlorophenoxybutyric acid collected during the December 5, 2022 monitoring event were from Poso Slough at Indiana Ave and were extracted 46 days outside the required seven day hold time requirements due to an incorrect Chain of Custody (COC) form that was submitted to the laboratory. Samples were flagged as being analyzed outside of hold time but are considered useable.

The five *Ceriodaphnia dubia* samples collected during the April 12, 2022 monitoring event were outside of the hold time requirements of 36 hours due to laboratory error. This batch contained samples collected from the following monitoring sites: Poso Slough at Indiana Ave, Hospital Creek at River Road, Ingram Creek at River Road, Ramona Lake near Fig Avenue, and Marshall Road Drain near River Road. The day following the original test initiation, laboratory personnel determined that the control replicate samples were not performed. As a result, the test was discarded, and a new test was reinitiated on April 14, 2022. Samples were flagged as being analyzed outside of hold time but are considered useable.

One MS and two environmental samples analyzed by EPA method 8081A collected during the March 8, 2022 monitoring event were extracted one day outside of the seven day hold time requirements due to a laboratory extraction error. This batch included samples collected from Marshall Road Drain near River Road and Westley Wasteway near Cox Road, where the MS was performed on the latter parent sample. The entire suite of EPA 8081A constituents in the batch were affected, which included chlorothalonil, DDD(p,p'), DDE(p,p'), and DDT(p,p'). Samples were flagged and are considered useable.

The environmental sample analyzed for diuron collected during the April 12, 2022 monitoring event had reported results that were analyzed 44 days outside of the 40 day analysis hold time requirements. The original analysis was performed within the required hold time but achieved results above the calibration curve. As a result, the sample was diluted by a factor of 20 and reanalyzed outside of hold time criteria but within the acceptable calibration range. The diluted sample result was consistent with the initial high detection and the reanalyzed results within the quantifiable range of the instrument were accepted. All diuron results were accepted and are considered useable.

The environmental sample analyzed for *E. coli* collected during the April 12, 2022 monitoring event was prepared by the laboratory one hour outside of the 24 hour hold time requirements due to a sample shipping error. The sample was collected at 8 A.M. on April 12th and received by the laboratory the following day at 7:16 A.M. Due to the late receival time, the sample could not be prepared until 7:59 A.M. The results were flagged and are considered useable.

The four environmental samples analyzed for oxyfluorfen collected during the January 10, 2023 monitoring event were extracted four days outside of the seven day extraction hold time requirements. This batch included samples collected from Blewett Drain at Highway 132, Los

Banos Creek @ Hwy 140, Marshall Road Drain near River Road, and Poso Slough at Indiana Ave. The original analysis was performed within hold time, however, the surrogate recovered below acceptable limits. To reevaluate the surrogate recovery, reanalysis was performed resulting in higher detections of oxyfluorfen and an acceptable recovery of the surrogate sample. The reanalysis results were accepted and flagged. All oxyfluorfen results are accepted and are considered useable.

PRECISION AND ACCURACY

Precision and accuracy are evaluated for each type of QC sample collected during the 2022 Monitoring Period (Table 19 through Table 29).

Briefly, they are addressed as follows:

- Evaluation of blank samples (field blank, and laboratory blank) – Table 19 and Table 21;
- Evaluation of field precision for chemistry, toxicity, and grain size – Table 20;
- Evaluation of laboratory accuracy (LCS, MS, and surrogates) – Table 22, Table 24, and Table 27;
- Evaluation of laboratory precision (LCS, MS, and laboratory duplicates) – Table 23, Table 25, and Table 26; and
- Summary of negative control toxicity tests – Table 28.

During the 2022 Monitoring Period, each batch was processed with a combination of any of the following QC samples: field blank, laboratory blank, MS, LCS, laboratory duplicate, field duplicate, and/or an appropriate set of surrogate samples.

Blank samples are analyzed to determine sources of contamination either during sample collection (field blanks) or during laboratory processing and analysis (laboratory blanks). Percent recoveries in LCS, certified reference material (CRM), MS, and surrogate samples are calculated to assess laboratory accuracy through the comparison of measured results to known concentrations of the target or comparable analytes. Relative percent differences (RPDs) are calculated on laboratory duplicate samples (including LCS and MS duplicates) to assess analytical precision. Field duplicate RPDs are calculated to assess field sampling precision.

When the concentration of a chemical constituent in an environmental sample exceeds the highest point on a calibration curve, a dilution of the sample is required. The laboratory reports the result of the diluted sample multiplied by the dilution factor to represent the concentration of the analyte detected in the original sample. All diluted samples are flagged accordingly in the database. The reporting limit (RL) associated with a diluted sample is multiplied by the dilution factor, thereby increasing the RL. Therefore, for each dilution that occurs, there is a corresponding increase in the limit of quantitation.

The RLs are established according to QAPP guidelines and reflect the lowest value laboratory instruments can reliably measure. Although instruments can detect analytes below the RL, accurate detections become less reliable, and results reported below the RL are associated with variability. Laboratories report all detections, even when analytes are detected at concentrations below the RL. When the concentration of an analyte is reported below the RL and above the

Method Detection Limit (MDL), the result is reported as an estimated value and flagged in the laboratory report with a "J Flag" and assigned a "DNQ" code in the database.

An evaluation of the precision and accuracy for each analyte or group of analytes is discussed in the sections below. Batches are accepted by evaluating all measures of precision and accuracy. Justification for accepting 2022 Monitoring Period data when MQO acceptability criteria fell below 90% is provided in each analyte section. Overall, precision and accuracy criteria were met for more than 90% of the samples for all criteria and all data are considered useable.

Chemistry

E. coli

Quality control samples analyzed for *E. coli* include field and laboratory blanks, and field and laboratory duplicates. In addition, sterility checks, positive/negative controls, and positive/positive controls are analyzed in each batch. Laboratory precision for *E. coli* is evaluated using the range of logarithms (R_{log}) for each pair of laboratory duplicates. The MQO is determined by calculating the mean R_{log} of at least 20 duplicate results and multiplying this value by 3.27.

The range of logarithms was calculated using laboratory duplicates performed on Coalition samples. The *E. coli* mean of R_{log} was 0.13 resulting in an acceptable limit for *E. coli* of $R_{log} \leq 0.41$. Laboratory duplicate acceptability criteria were met for 12 of 12 (100%) samples. All other MQO's were met in 100% of *E. coli* QC samples during the 2022 Monitoring Period excluding field duplicates. Acceptability (RPD ≤ 25 if |Difference| ≥ RL) was met for 10 of 12 (83.3%) field duplicate samples. The rationale for accepting these samples is discussed below.

The field duplicate samples were collected from Newman Wasteway near Hills Ferry Road during the March 8 and August 9 sampling events of the 2022 Monitoring Period. These samples exceeded the duplicate acceptability criteria of an RPD ≤ 25% if |Difference| ≥ RL at 146% and 50%, respectively. The environmental sample collected during the March event had a concentration of 5.2 MPN/100mL and a field duplicate concentration of 33.6 MPN/100mL. The laboratory duplicate associated with this batch met the acceptable R_{log} precision criteria of 0.41 at 0.169. The environmental sample collected during the August event had a concentration of 435.2 MPN/100 mL and the field duplicate result was 727 MPN/100 mL. The laboratory duplicate associated with this batch met the acceptable R_{log} criteria of 0.41 at 0.074. Both batches were accepted based on the laboratory duplicate results that were within acceptable limits. All *E. coli* results were accepted and are considered useable.

Hardness as $CaCO_3$ (dissolved)

Hardness is analyzed in samples that are also analyzed for dissolved metals. The hardness measured in the sample is used to calculate the hardness based WQTLs for dissolved metals. Quality control samples for hardness include field and laboratory blanks, field duplicates, LCS, MS, and laboratory duplicate samples (usually an LCSD or MSD).

Measurement quality objectives were met in 100% of hardness field blanks, laboratory duplicates, laboratory blanks, LCS, and MS samples during the 2022 Monitoring Period.

Metals (dissolved)

All metals are analyzed following EPA method 200.8. Samples collected for dissolved metals are filtered through a 0.45 µm filter and preserved with nitric acid to measure the dissolved fraction, which is performed by the analyzing laboratory. Dissolved metal samples are analyzed with the following QC: field blank, laboratory blank, field duplicate, MS, LCS, and laboratory duplicate samples.

Dissolved metals analyzed during the 2022 Monitoring Period include cadmium, copper, lead, nickel, and zinc. Acceptability criteria were met for at least 90% of quality control samples analyzed for dissolved metals except for copper field blank samples (9 of 12, 75% met acceptability criteria). The rationale for accepting these samples is discussed below.

Dissolved copper was detected in three field blanks associated with the Newman Wasteway near Hills Ferry Road monitoring site during the August 9, September 13, and December 5 sampling events of 2022. The results reported for these samples were slightly above the RL of 0.5 mg/L at 0.56 mg/L, 0.71 mg/L, and 0.83 mg/ L, respectively. The batch was accepted based on no detections of the constituent in the laboratory blank and all other batch QC meeting acceptability criteria. All dissolved copper results were accepted and are considered useable. Field blank detections are discussed further in Corrective Actions.

All dissolved metal results for the 2022 Monitoring Period were accepted and are considered useable.

Metals (total)

Total arsenic, boron, molybdenum, and selenium were analyzed for the 2022 Monitoring Period. Total metals are analyzed following EPA 200.8 with the following QC samples: laboratory blanks, field blanks, LCS, MS, laboratory duplicates (usually an LCS or MS duplicate), and field duplicates. Acceptability was met in greater than 90% of field blanks, field duplicates, laboratory blanks, LCS, MS, and MSD samples except for boron MS samples (38 of 54, 70.4% within acceptable limits). Rationale for accepting these samples is discussed below.

Of the 16 MS samples performed for boron, 11 recovered below the minimum limit of 75% with ranging from 20-74% and five recovered above the maximum limit of 125% with results ranging from 140-200%. All the associated batches were accepted based on the LCS samples that recovered within acceptable limits ranging from 91-104%. All boron results were accepted and are considered useable.

All total metal results for the 2022 Monitoring Period were accepted and are considered useable.

Nutrients

Nutrients analyzed in water samples include ammonia as N, nitrate + nitrite as N, and orthophosphate as P. Quality control samples for these constituents include laboratory blanks, field blanks, field duplicates, LCS, MS, and a laboratory duplicate in the form of an MSD or LCSD. Acceptability criteria were met in at least 90% of QC samples for ammonia as N, nitrate + nitrite as N, and orthophosphate as P except for ammonia field blanks (10 of 12, 83.3% within acceptable limits), and nitrate + nitrite as N field duplicate (10 of 12, 83.3% within acceptable limits) and MS samples (31 of 40, 77.5% within acceptable limits). The rationale for accepting these samples is discussed below.

Two field blank samples for ammonia as N resulted in detections above the RL of 0.1 mg/L. The field blank collected at Newman Wasteway near Hills Ferry Road during the December 5, 2022 monitoring event resulted in a concentration of 0.33 mg/L compared to the environmental concentration of 0.3 mg/L. The laboratory reported that the sample that was provided was discolored and contained sediment raising concerns about sources of field contamination or potential mislabeling of samples (e.g., environmental water inadvertently labelled as blank water). The field blank sample collected at San Joaquin River at Lander Avenue during the January 10, 2023 monitoring event resulted in a concentration of 0.14 mg/L compared to the environmental sample concentration of 0.66 mg/L. The laboratory reported no discoloration or sediment was observed in the sample. In both analytical batches, there was no detection of ammonia as N in the laboratory blank samples and all other batch QC met acceptability criteria. The batches were accepted based on other batch QC meeting acceptability criteria. All ammonia as N results were accepted and are considered useable. Field blank ammonia as N detections are discussed further in Corrective Actions.

The field duplicate sample for nitrate + nitrite as N collected from Newman Wasteway near Hills Ferry Road during the May 10, 2022 sampling event resulted in an RPD that exceeded the acceptable RPD of ≤ 25% at 141%. The environmental and field duplicate concentrations were above the RL of 0.05 mg/L at 1.5 mg/L and 0.26 mg/L, respectively. All other batch QC samples met MQO criteria. The batch was accepted based on other batch QC samples.

The field duplicate sample for nitrate + nitrite as N collected from Salt Slough at Sand Dam during the June 14, 2022 sampling event resulted in an RPD that exceeded the acceptable RPD of ≤ 25% at 55%. The environmental and field duplicate concentration were above the RL of 0.05 mg/L at 0.21 mg/L and 0.12 mg/L, respectively. All other batch QC samples met MQO criteria. The batch was accepted based on other batch QC samples.

Of the nine MS samples for nitrate + nitrite as N that recovered outside of the acceptable limits of 90-110%, seven samples recovered above limits with results ranging from 116-131% and two samples recovered below limits at 80% and 87%. The MS samples that resulted in high recoveries were analyzed with at least one environmental sample that either had no detections or had an estimated detection below the reporting limit indicating that the results were unaffected by a potential high bias in the positive control samples. The MS samples that resulted in low recoveries were analyzed with environmental samples that all reported detections above the RL of 0.05 mg/L ranging from 0.096 mg/L to 3.3 mg/L indicating that the analytes were reliably quantified. All associated batches included an LCS sample that recovered within limits, ranging from 92-100%. All batches containing MS with high recoveries were accepted based on the recovery of the LCS samples and because high bias did not affect the results. Both batches containing MS with low recoveries were accepted based on the recovery of the LCS samples and because results were reliably quantified. All nitrate + nitrite as N results were accepted and are considered useable.

All nutrient results for the 2022 Monitoring Period were accepted and are considered useable.

Pesticides in water

Pesticides in the 2022 Monitoring Period were analyzed with the following methods as outlined in the QAPP:

Organochlorine Pesticides by EPA 8081A
Organophosphorus Compounds by EPA 8141A
Chlorinated Herbicides by EPA 615
Solvent-extractable Non-volatiles by EPA 8321A
Volatile Organic Compounds and Gasoline by EPA 8260BM
Paraquat by EPA 549.2M
Assorted Pesticides by NCL ME 340

Quality control samples for pesticides in the water column include field blank, field duplicate, laboratory blank, LCS, MS, and laboratory duplicate samples (usually an LCSD or MSD). Acceptability criteria for pesticides in water samples are evaluated per analyte. For each analyte, 100% of field blank and laboratory blank samples met acceptability criteria.

Although acceptability criteria were not achieved in 100% of the field duplicate, LCS, LCSD, MS, and surrogate samples, most analytes met the 90% acceptability requirement for the Monitoring Period. The exceptions are outlined below.

The following pesticide QC samples did not meet MQOs in at least 90% of the total samples analyzed:

Carbaryl LCS (5 of 6, 83.3%), LCSD (1 of 3, 33.3%), and MSD (2 of 3, 66.7%) samples;
Chloropicrin MS (4 of 6, 66.7%) samples;
Chlorothalanil LCS (11 of 13, 84.6%) samples;
Chlorpyrifos LCSD (8 of 9, 88.9%), MS (18 of 24, 75.0%), and MSD (10 of 12, 83.3%) samples;
DDD(p,p') LCSD (5 of 6, 83.3%) and MS (12 of 14, 85.7%) samples;
DDE(p,p') LCS (11 of 13, 84.6%) and LCSD (5 of 6, 83.3%) samples;
DDT(p,p') LCS (11 of 13, 84.6%) samples;
Diazinon LCSD (8 of 9, 88.9%), MS (20 of 24, 83.3%), and MSD (10 of 12, 83.3%) samples;
Dichlorvos MSD (1 of 2, 50.0%) samples;
Dimethoate LCS (10 of 13, 76.9%), MS (9 of 16, 56.3%), and MSD (7 of 8, 87.5%) samples;
Imidacloprid LCSD (3 of 5, 60.0%), MS (8 of 10, 80.0%), and MSD (4 of 5, 80.0%) samples;
Linuron MS (1 of 2, 50.0%) samples;
Malathion LCS (10 of 12, 83.3%) samples;
Methomyl LCSD (5 of 7, 71.4%), MS (11 of 14, 78.6%) and MSD (5 of 7, 71.4%) samples;
Oxyfluorfen LCS (17 of 19, 89.5%) and LCSD (8 of 9, 88.9%) samples;
Paraquat MS (6 of 22, 27.3%) samples;
Pendimethalin LCS (8 of 12, 66.7%), LCSD (5 of 6, 83.3%), MS (8 of 12, 66.7%), and MSD (4 of 6, 66.7%) samples;
Simazine MSD (5 of 6, 83.3%) samples;
Trifluralin LCS (6 of 7, 85.7%) and MS (6 of 8, 75.0%) samples.

The LCS replicates for carbaryl associated with the May 10, 2022 monitoring event recovered at 56.5% and 42.2%. The LCSD recovered slightly below the acceptable limit of 44% at 42.2% and resulted in an RPD above the acceptable limit of ≤ 25% at 29.0%. The MS (60.2%) and MSD (83.3%) associated with this batch recovered within acceptable limits, though the associated RPD was above the acceptable limit (25%) at 32.1%. The batch was accepted based on the recovery of the LCS, MS, and MSD samples. All carbaryl results were accepted and are considered useable.

The MS for chloropicrin analyzed with samples collected during the September 13, 2022 monitoring event recovered below the acceptable limit of 85.5% at 77.8%. The MSD (93.6%), LCS (91.2%), and LCSD (87.9%) samples all recovered within limits. Furthermore, the LCS and LCSD samples had an acceptable RPD of 3.7%. The batch was accepted based on the recovery of the MS, LCS, and LCSD and the precision of the LCS and LCSD samples.

The MSD for chloropicrin analyzed with samples collected during the November 9, 2022 monitoring event recovered slightly above the acceptable limit of 124% at 126%. There was no detection of chloropicrin in the environmental samples included in the batch indicating that the results were not affected by high bias observed in the MSD. The MS (93.6%), LCS (91.2%), and LCSD (87.9%) all recovered with acceptable limits. All chloropicrin results were accepted and are considered useable.

The LCS and LCSD for chlorothalonil associated with the March 8, 2022 monitoring event recovered above the acceptable limit of 137% at 157% and 155%, respectively. There was no detection of chlorothalonil in the environmental samples included in the batch indicating that the results were not affected by high bias observed in the LCS and LCSD samples. The MS (123%) and MSD (117%) both recovered with acceptable limits. All chlorothalonil results were accepted and are considered useable.

The LCS (68.8%) and LCSD (51.3%) for chlorpyrifos associated with the January 10, 2023 monitoring event recovered within limits and had a resulting RPD value above the acceptable limit of 25% at 29.3%. The analytical batch included MS (18.5%) and MSD (18.25%) samples that recovered below the acceptable limit of 61% and resulted in an acceptable RPD of 1.58%. The batch was accepted based on the recovery of the LCS and LCSD samples.

The MS and MSD for chlorpyrifos analyzed with samples collected during the February 14, 2022 monitoring event recovered below the acceptable limit of 61% at 49.2% and 32.0%, respectively. The MS and MSD resulted in an RPD above the acceptable limit of ≤ 25% at 42.5%. The LCS (68.5%) and LCSD (78.36%) recovered within limits and resulted in an acceptable RPD of 13.7%. The batch was accepted based on the recovery and precision of the LCS and LCSD samples.

The MS and MSD for chlorpyrifos analyzed with samples collected during the September 13, 2022 monitoring event recovered below the acceptable limit of 61% at 48.2% and 43.2%, respectively. The LCSD recovered within limits at 80.6% and no detections of chlorpyrifos in the blank samples. The batch was accepted based on the recovery of the LCSD sample and other batch QC that met MQO requirements. All chlorpyrifos results were accepted and are considered useable.

The LCS (117%) and LCSD (84.7%) sample for DDD(p,p') associated with the August 9, 2022 monitoring event recovered within limits and resulted in an RPD above the acceptable limit of

25% at 32.2%. The MS (100%) and the MSD (96.9%) recovered within limits and resulted in an acceptable RPD of 3.15%. The batch was accepted based on the recovery and precision of the MS and MSD samples.

The MS and MSD for DDD(p,p') analyzed with samples collected during the May 10, 2022 monitoring event recovered slightly below the acceptable limit of 38% at 33% and 35.2%, respectively. The LCS (65.3%) and the LCSD (77.1%) recovered within limits and resulted in an acceptable RPD of 16.6%. The batch was accepted based on the recovery and precision of the LCS and LCSD samples. All DDD(p,p') results were accepted and are considered useable.

The LCS and LCSD samples for DDE(p,p') associated with the March 8, 2022 monitoring event recovered above the acceptable limit of 134% at 140% and 138%, respectively. The environmental samples showed no detection of DDE(p,p') indicating that the results were not affected by high bias. The associated MS and MSD samples recovered within limits at 144% and 122%, respectively. The batch was accepted based on the recovery and precision of the MS and MSD samples.

The LCS (95.6%) and LCSD (73.2%) sample for DDE(p,p') associated with the August 9, 2022 monitoring event recovered within limits and resulted in an RPD slightly above the acceptable limit of ≤ 25% at 26.5%. The MS (86.0%) and the MSD (79.3%) recovered within limits and resulted in an acceptable RPD of 8.03%. The batch was accepted based on the recovery of the LCS and LCSD samples and the precision of the MS and MSD samples. All DDE(p,p') results were accepted and are considered useable.

The LCS and LCSD samples for DDT(p,p') associated with the March 8, 2022 monitoring event recovered above the acceptable limit of 145% at 155% and 154%, respectively. The environmental samples showed no detection of DDT(p,p') indicating that the results were not affected by high bias. The associated MS and MSD recovered within acceptable limits at 130% and 136%, respectively. All DDT(p,p') results were accepted and are considered useable.

The MS (14.36%) and MSD (20.7%) for diazinon analyzed with samples collected during the January 10, 2023 monitoring event recovered below the acceptable limit of 57% and resulted in an RPD above the acceptable limit of RPD ≤ 25% at 34.8%. The LCS and LCSD for diazinon recovered at 73.9% and 55.0%, respectively, and resulted in an RPD above the acceptable limit of 25% at 29.4%. The LCS recovered within limits and there was no detection of diazinon in the field blank, laboratory blank, and environmental samples, indicating the environmental samples were not affected by the variability observed in the positive control samples. The batch was accepted based on the recovery of the LCS and blank samples that met MQO criteria.

The MS and MSD for diazinon analyzed with samples collected during the February 14, 2023 monitoring event recovered below the acceptable limit of 57% at 50.3% and 30.6%, respectively. The MS and MSD resulted in an RPD above the acceptable limit of 25% at 48.5%. The LCS (61.1%) and the LCSD (72.8%) recovered within limits and resulted in an acceptable RPD of 17.5%. The batch was accepted based on the recovery and precision of the LCS and LCSD samples. All diazinon results were accepted and are considered useable.

The MS and MSD for dichlorvos analyzed with samples collected during the October 11, 2022 monitoring event resulted in an RPD above the acceptable limit of RPD ≤ 25% at 69.3%. The MS and MSD recovered within limits at 64.2% and 132%, respectively. The LCS (50.2%) recovered within limits and there was no detection of dichlorvos in the field blank, laboratory blank, and environmental samples. The batch was accepted based on the recovery of the LCS sample and other QC samples that met MQO criteria. All dichlorvos results were accepted and are considered useable.

The LCS and LCSD samples for dimethoate associated with the March 8, 2022 monitoring event recovered slightly below the acceptable limit of 68% at 65.0% and 64.9%, respectively. The MS (68.6%) and the MSD (75.2%) recovered within limits and resulted in an acceptable RPD of 9.26%. The batch was accepted based on the recovery and precision of the MS and MSD samples.

The LCS sample for dimethoate associated with the August 9, 2022 monitoring event recovered below the acceptable limit of 68% at 58.7%. The MS (58.0%) and MSD (59.6%; RPD = 2.74%) samples also recovered slightly below the lower acceptability limits. There was no detection of dimethoate in the field blank and laboratory blank samples. The batch was accepted based on other QC samples that met MQOs.

The MS and MSD for dimethoate analyzed with samples collected during the May 10, 2022 monitoring event recovered below the acceptable limit of 68% at 46.2% and 49.69%, respectively. The LCS (80.9%) and the LCSD (79.0%) recovered within acceptable limits. The batch was accepted based on the recovery of the LCS and LCSD samples.

The MS and MSD for dimethoate analyzed with samples collected during the June 14, 2022 monitoring event recovered below the acceptable limit of 68% at 57.7% and 67.8%, respectively. The LCS (82.1%) and the LCSD (84.6%) recovered within limits. The batch was accepted based on the recovery of the LCS and LCSD samples.

The MSD for dimethoate analyzed with samples collected during the July 12, 2022 monitoring event recovered below the acceptable limit of 68% at 58.8%. Furthermore, the MS and MSD resulted in an RPD above the acceptable limit of 25% at 26.3%. The associated MS (76.7%) and the LCS (84.7%) recovered within limits. The batch was accepted based on the recovery of the MS and LCS samples.

The MS and MSD for dimethoate analyzed with samples collected during the August 9, 2022 monitoring event recovered below the acceptable limit of 68% at 58.0% and 59.6%, respectively. There was no detection of dimethoate in the field blank, laboratory blank, and environmental samples. The batch was accepted based on other QC samples that met MQOs. All dimethoate results were accepted and are considered useable.

The LCS (54.9%) and LCSD (74.9%) samples for imidacloprid associated with the May 10, 2022 monitoring event recovered within limits but resulted in an RPD above the acceptable limit of RPD ≤ 25% at 30.9%. The MS (43.8%) and the MSD (77.8%) also recovered within limits and resulted in an RPD above the acceptable limit of 25% at 47.5%. The batch was accepted based on the recovery of the LCS, LCSD, MS, and MSD samples.

The LCS and LCSD samples for imidacloprid associated with the July 12, 2022 monitoring event resulted in an RPD above the acceptable limit of 25% at 59.8%. The LCS (114%) and the LCSD (61.6%) recovered within acceptable limits. The MS and MSD samples associated with this batch recovered above the acceptable limit of 130% at 209% and 170%, respectively, and resulted in an acceptable RPD of 16.8%. The batch was accepted based on the recovery of the LCS and LCSD samples and the precision of the MS and MSD samples. All imidacloprid samples were accepted and are considered useable.

Linuron in the MSD sample analyzed with samples collected during the January 10, 2023 monitoring event was not recovered. The associated MS sample recovered within limits at 51.6%. The LCS (52.4%) and the LCSD (50.1%) recovered within limits and resulted in an acceptable RPD of 4.38%. The batch was accepted based on the recovery of the other positive control samples and the precision of the LCS and LCSD samples. All linuron results were accepted and are considered useable.

The LCS and LCSD samples for malathion associated with the September 13, 2022 monitoring event recovered above the upper acceptability limit of 125% at 130% and 155%, respectively. There were no detections of malathion in the environmental samples indicating that the results were unaffected by high bias. The MS and MSD recovered within acceptable limits at 115% and 104%, respectively. The batch was accepted based on the MS sample recoveries and all malathion results are considered useable.

The LCS and LCSD for methomyl associated with the July 12, 2022 monitoring event resulted in and RPD above the acceptable limit of RPD ≤ 25% at 109%. The LCS (31.6%) and the LCSD (108%) both recovered with limits. The MS (176%) and MSD (270%) recovered above the acceptable limit of 152% and resulted in an RPD above the acceptable limit of 25% at 41.9%. The batch was accepted because there were no detections of methomyl in the environmental samples indicating the results are unaffected by variability or high bias in the positive control samples.

The LCS and LCSD for methomyl associated with the October 11, 2022 monitoring event recovered within limits at 74.7% and 159%, respectively, and resulted in an RPD above the acceptable limit of25% at 71.9%. The MS sample recovered within limits at 96.8% and the MSD was not recovered. There was no detection of methomyl in the environmental samples associated with this batch. The batch was accepted based on the recovery of the LCS and MS samples.

The MS (30.1%) and MSD (44.1%) for methomyl analyzed with samples collected during the May 17, 2022 monitoring event recovered within limits and resulted in an RPD above the acceptable limit of ≤ 25% at 37.5%. The LCS (40.3%) and LCSD (48.6%) recovered within limits and resulted in an acceptable RPD of 18.7%. The batch was accepted based on the recovery of the positive control samples and the precision of the LCS and LCSD samples. All methomyl results were accepted and are considered useable.

The LCS and LCSD samples for oxyfluorfen associated with the March 8, 2022 monitoring event recovered above the acceptable limit of 138% at 150% and 154%, respectively. The MS (115%) and MSD (122%) recovered within limits. The batch was accepted based on the recovery of the MS and MSD samples.

The LCS and LCSD samples for oxyfluorfen associated with the November 9, 2022 monitoring event resulted in and RPD above the acceptable limit of 25% at 61.8%. The LCS (67.2%) and LCSD (127%) samples recovered within limits. The MS (46.9%) and MSD (59.0%) samples recovered within limits and resulted in an acceptable RPD of 22.8%. The batch was accepted based on the recovery of the positive control samples and the precision of the MS and MSD samples. All oxyfluorfen results were accepted and are considered useable.

All 16 MS samples for paraquat that did not meet MQO criteria were the result of 0% recovery of paraquat in the MS. The LCS samples associated with these batches recovered within limits ranging from 70.2 to 90.9% and resulted in acceptable RPD values. The poor matrix spike recoveries may be due to increased sediment observed in the parent sample matrix. Paraquat strongly adsorbs to soil particles that are suspended in water. The strong chemical bonds make the herbicide chemically inactive. When bound with soil particles, the extraction procedure for method EPA 549.2 is ineffective at isolating the bound paraquat. Any reported paraquat represents the dissolved analyte in the water that has not been bound to the soil particles. Since the LCS and LCSD samples recovered within limits, the low recovery of the MS and MSD samples may be due to matrix effects. All batches were accepted based on the accuracy and precision of the LCS and LCSD samples. All paraquat results were accepted and are useable.

The LCS and LCSD samples for pendimethalin associated with the November 9, 2022 monitoring event recovered above the acceptable limit of 129% at 130% and 144%, respectively and resulted in an acceptable RPD of 9.80%. The MS recovered within limits at 83.8% and the MSD recovered above the acceptable limit of 129% at 136%. Furthermore, the MS and MSD resulted in an RPD above the acceptable limit of ≤ 25% at 47.4%. The batch was accepted based on the precision of the LCS and LCSD samples and because there were no detections of pendimethalin in the environmental samples indicating that the results were unaffected by high bias in the positive control samples.

The LCS and LCSD samples for pendimethalin associated with the January 10, 2023 monitoring event recovered below the acceptable limit of 63% at 50.7% and 0.0%. Reanalysis of the LCS and LCSD samples confirmed the original results. The MS and MSD samples associated with this batch recovered below the acceptable limit of 63% at 38.5% and 39.1%, respectively. The batch was accepted based on other QC samples that met MQOs.

The MSD for pendimethalin analyzed with samples collected during the February 14, 2022 monitoring event recovered below the acceptable limit of 63% at 50.1%. Furthermore, the MS and MSD resulted in an RPD above the acceptable limit of 25% at 38.9%. The MS (74.2%), LCS (94.0%), and LCSD (118%) recovered within limits. Additionally, the LCS and LCSD resulted in an acceptable RPD of 22.4%. The batch was accepted based on the recovery of the other positive control samples and the precision of the LCS and LCSD samples. All pendimethalin results were accepted and are considered useable.

The MS (29.0%) and MSD (41.3%) for simazine analyzed with samples collected during the January 10, 2023 monitoring event recovered within limits and resulted in an RPD above the acceptable limit of 25% at 35.1%. The LCS (79.7%) and LCSD (79.7%) samples recovered within limits and resulted in an acceptable RPD of 0%. The batch was accepted based on the recovery of the positive control samples and the precision of the LCS and LCSD samples. All simazine results were accepted and are considered useable.

The LCS for trifluralin associated with the October 11, 2022 monitoring event recovered above the acceptable limit of 117% at 121%. The MS recovered within limits at 114% and the MSD recovered above the acceptable limit of 117% at 130%. The batch was accepted based on the recovery of the MS sample and because there were no detections of trifluralin in the environmental samples indicating that the results were unaffected by high bias in the positive controls.

The MS for trifluralin analyzed with samples collected during the November 9, 2022 monitoring event recovered below the acceptable limit of 44% at 42.3%. The MSD (47.1%), LCS (55.6%), and LCSD (47.2%) samples recovered within limits. Furthermore, the LCS and LCSD resulted in an acceptable RPD of 15.8%. The batch was accepted based on the recovery of the other positive control samples and the precision of the LCS and LCSD samples. All trifluralin results were accepted and are considered useable.

Pyrethroid pesticides in water

Pyrethroid pesticides are analyzed by EPA Method 625.1 with negative chemical ionization (NCI). For the 2022 Monitoring Period the following pyrethroid pesticides were collected: bifenthrin, cyfluthrin, lambda-cyhalothrin, cypermethrin, esfenvalerate/fenvalerate, fenpropathrin and permethrin.

For each of these analytes, acceptability criteria were met in 100% of field duplicate, field blank, laboratory blank, LCS, LCSD, MS, and MSD samples except for fenpropathrin LCS samples (17 of 19, 89.5% within acceptable limits).

The LCS and LCSD samples for fenpropathrin associated with the June 14, 2022 monitoring event recovered slightly above the acceptable limit of 150% at 155% and 158%, respectively. The MS (144%) and MSD (138%) samples recovered within limits. The batch was accepted based on the recovery of the MS and MSD samples. All fenpropathrin results were accepted and all pyrethroid pesticide data are considered useable.

Surrogates for pesticides in water

For most of the pesticide samples analyzed, a known amount of a surrogate standard is added to each sample to monitor target analyte recovery. A surrogate is a non-target analyte that is chemically similar to the target analyte(s) and therefore expected to respond similarly to sample preparation and analysis.

During the 2022 Monitoring Period, all surrogate recoveries met acceptable limits in 90% of samples for each analytical method except for the tributylphosphate and triphenyl phosphate surrogates analyzed by EPA method 8141A.

Pesticides analyzed by EPA method 8141A are processed with tributylphosphate and triphenyl phosphate surrogates. The target analytes associated with EPA method 8141A for the 2022 Monitoring Period include chlorpyrifos, diazinon, dichlorvos, dimethoate, hexazinone, malathion, methyl parathion, pendimethalin, prometryn, simazine, and trifluralin. Acceptability criteria were met in 173 of 209 (82.8%) tributylphosphate surrogate samples and 173 of 209 (82.8%) triphenyl phosphate surrogate samples analyzed with EPA 8141A results during the 2022 Monitoring Period. Batches where MQO requirements were not met for surrogate samples are discussed below.

Of the 36 tributylphosphate surrogate samples outside of acceptable limits, 25 recovered below the acceptable limit of 60% ranging from 9.35-59%. Each of the samples associated with low surrogate recovery was part of a batch associated with a target analyte MS that was within acceptable limits, indicating the analyte response was sufficient for the target analytes to be detected. The batches were accepted based on target analyte QC samples that met MQO criteria.

The other 11 tributylphosphate surrogate samples outside of acceptable limits recovered above the limit of 150% ranging from 157-3420%. All batches associated with the high surrogate recoveries reported no detections in the environmental samples for target analytes indicating that the results were not affected by high bias in the surrogate samples. All tributylphosphate surrogate results were accepted based on this reasoning.

Of the 38 triphenyl phosphate surrogate samples outside of acceptable limits, 34 recovered below the acceptable limit of 56% ranging from 11.2-55.9%. Each of the samples associated with low surrogate recovery was part of a batch associated with a target analyte MS that was within acceptable limits, indicating the analyte response was sufficient for the target analytes to be detected. In each case the batch was accepted based on target analyte QC samples that met MQO criteria.

The other four triphenyl phosphate surrogate samples outside of acceptable limits recovered above the limit of 129% ranging from 132-378%. All batches reported no detections in the environmental samples for target analytes indicating that the results were not affected by high bias in the surrogate samples. All batches were accepted based on this reasoning. All EPA 8141A results were accepted and are considered useable. All surrogate recoveries and the associated target analyte results were accepted and are useable.

Total Organic Carbon (TOC) in water

Quality Control samples for TOC analyses consist of laboratory blank, field blank, field duplicate, LCS, MS, and laboratory duplicate samples. Measurement quality objectives were met in at least 90% of TOC QC samples during the 2022 Monitoring Period. All TOC results were accepted and are considered useable.

Dissolved Organic Carbon (DOC) in water

Quality Control samples for DOC analyses consist of laboratory blank, field blank, field duplicate, LCS, MS, and laboratory duplicate samples. Measurement quality objectives were met in at least 90% of DOC QC samples during the 2022 Monitoring Period. All DOC results were accepted and are considered useable.

Total Suspended Solids (TSS)

Quality control samples for TSS analytes include field blanks, laboratory blanks, field duplicates, laboratory duplicates, and LCS samples. Acceptability was met in 100% of the field blank, laboratory blank, LCS, and laboratory duplicate samples. Acceptability was met in 9 of 12 (75.0%) field duplicate samples.

The acceptable RPD for TSS field duplicates is ≤ 25% if |Difference| ≥ RL. Field duplicate RPDs exceeded the acceptable limit in samples collected from the following sites and dates:

Newman Wasteway near Hills Ferry Road on March 8, 2022;
Mud Slough Upstream of San Luis Drain on October 11, 2022;
San Joaquin River at Lander Avenue on November 9, 2022.

The environmental and field duplicate samples collected on March 8, 2022 from Newman Wasteway near Hills Ferry Road resulted in concentrations above the RL of 3 mg/L at of 12 mg/L and 6.3 mg/L, respectively. As a result, the RPD was above the acceptable limit of 25% at 62%. The turbidity analysis for the sample also resulted in high observed variability at an RPD of 195% indicating the heterogeneity of the water column at the time of sample collection for this site.

The environmental and field duplicate samples collected on October 11, 2022 from Mud Slough Upstream of San Luis Drain resulted in concentrations of 16 mg/L and 9.4 mg/L, respectively. As a result, the RPD was above the acceptable limit of 25% at 52%. The batch was accepted based on other QC samples that met MQO criteria.

The environmental and field duplicate samples collected on November 9, 2022 from San Joaquin River at Lander Avenue resulted in concentrations of 102 mg/L and 159 mg/L, respectively. As a result, the RPD was above the acceptable limit of 25% at 44%. The batch was accepted based on other QC samples that met MQO criteria.

All TSS results for the 2022 Monitoring Period were accepted and are considered useable.

Turbidity

Quality control samples analyzed for turbidity include field blanks, laboratory blanks, field duplicates, laboratory duplicates, and LCS samples. Acceptability was met in at least 90% of QC samples for the 2022 Monitoring Period. All turbidity results were accepted and are considered useable.

Pesticides in sediment

Sediment samples are collected twice a year to test for toxicity to *H. azteca*. If the percent survival is less than 80% compared to the control and statistically significant, then the sediment is analyzed for pyrethroids and chlorpyrifos using EPA 8270 (Negative Chemical Ionization, NCI) and PBO using method EPA 8270 (Selective Ion Monitoring, SIM).

Sediment samples were collected in the spring on March 7-8, 2022 and in the fall on September 12-13, 2022. During the 2022 Monitoring Period, additional sediment chemistry analyses were requested for samples collected from Del Puerto Creek at Highway 33 for the March and

September monitoring event, Hospital Creek at River Road for the March monitoring event, and Ingram Creek at River Road for the March and September monitoring event. Overall, acceptability for the entire year is based on the performance of two analytical batches.

Quality control samples for sediment analytes run by EPA 8270 (both NCI and SIM) include laboratory blank, LCS, MS, and laboratory duplicate samples. Measurement Quality Objectives were met in 100% sediment pesticide laboratory blank, LCS, and LCSD samples for the 2022 Monitoring Period. Matrix Spike and MSD MQOs were met in at least 90% of the samples excluding: PBO MS (3 of 4, 75.0%) and MSD (1 of 2, 50.0%), bifenthrin MS (1 of 4, 25.0%), chlorpyrifos MS (2 of 4, 50.0%), fenpropathrin MS (2 of 4, 50.0%), total cypermethrin MS (3 of 4, 75.0%), total lambda-cyhalothrin (2 of 4, 50.0%), and total permethrin MS (2 of 4, 50.0%).

The MSD sample for PBO analyzed with samples collected during the September 12, 2022 monitoring event recovered above the acceptable limit of 150% at 249%. The MS sample recovered within limits at 150% and the resulting RPD was above the acceptable criteria of ≤ 35% at 50%. There were no detections of PBO in the environmental samples analyzed indicating that the results were not affected by high bias, nor would they be affected by the variability observed in the positive control samples. All PBO results were accepted and are considered useable.

The MS and MSD samples for bifenthrin associated with samples collected during the March 7, 2022 monitoring event recovered above the acceptable limit of 150% at 187% and 203%, respectively. The LCS (100%) and LCSD (103%) samples recovered within limits. The batch was accepted based on the recovery of the LCS and LCSD samples.

The MS sample for bifenthrin associated with samples collected during the September 12, 2022 monitoring event recovered below the acceptable limit of 50% at 20%. The associated MS (100%) and LCSD (80%) recovered within limits. The MS and MSD resulted in an acceptable RPD of 14%. The batch was accepted based on the recovery of the other positive control samples and the precision of the MS and MSD samples. All bifenthrin results were accepted and are considered useable.

The MS and MSD samples for chlorpyrifos associated with samples collected during the March 7, 2022 monitoring event recovered above the acceptable limit of 150% at 196% and 193%, respectively. The LCS (96%) and LCSD (98%) samples recovered within limits and there was no chlorpyrifos detected in the environmental samples indicating that the results were not affected by high bias. The batch was accepted based on the recovery of the LCS and LCSD samples. All chlorpyrifos results were accepted and are considered useable.

The MS and MSD samples for fenpropathrin associated with samples collected during the March 7, 2022 monitoring event recovered above the acceptable limit of 150% at 161% and 167%, respectively. The LCS (103%) and LCSD (106%) recovered within limits and there was no detection of fenpropathrin in the environmental samples. The batch was accepted based on the recovery of the LCS and LCSD samples. All fenpropathrin results were accepted and are considered useable.

The MS sample for total cypermethrin associated with samples collected during the March 7, 2022 monitoring event recovered above the acceptable limit of 150% at 154%. The associated MS

(150%), LCS (104%), and LCSD (106%) recovered within limits. Of the three environmental samples analyzed, two resulted in no detection of cypermethrin indicating that the results were not affected by high bias. The batch was accepted based on the recovery of the MS, LCS, and LCSD samples. All total cypermethrin results were accepted and are considered useable.

The MS and MSD samples for total lambda-cyhalothrin associated with samples collected during the March 7, 2022 monitoring event recovered above the acceptable limit of 150% at 157% for both samples. The LCS (102%) and LCSD (102%) samples recovered within limits. The batch was accepted based on the recovery of the LCS and LCSD samples. All total lambda-cyhalothrin results were accepted and are considered useable.

The MS and MSD samples for total permethrin associated with samples collected during the March 7, 2022 monitoring event recovered above the acceptable limit of 150% at 160% and 168%, respectively. The LCS (91%) and LCSD (100%) samples recovered within limits. Of the three environmental samples analyzed, two resulted in no detection of permethrin indicating that the results were not affected by high bias. The batch was accepted based on the recovery of the LCS and LCSD samples. All total permethrin results were accepted and are considered useable.

Surrogates for Pesticides in sediment

Sediment chemistry samples analyzed for pesticides using either EPA 8270C SIM or EPA 8270M NCI are fortified with a deuterated esfenvalerate surrogate standard to monitor analyte response to sample preparation and analysis. One hundred percent of the labelled esfenvalerate surrogates analyzed by EPA 8270 NCI recovered within acceptance limits for the 2022 Monitoring Period. Only 7 of 9 (77.8%) esfenvalerate surrogate samples analyzed by EPA 8270 SIM recovered within limit of the total samples analyzed.

The surrogate samples for esfenvalerate associated with samples collected during the March 7, 2022 monitoring event recovered above the acceptable limit of 150% at 155% and 172%, respectively. The target analyte (PBO) laboratory blank, MS/MSD, and LCS/LCSD samples met MQOs. The batch was accepted based on the target analyte QC samples meeting MQO criteria. All esfenvalerate surrogate results were accepted and are considered useable.

Sediment grain size and TOC

Samples were collected for sediment grain size and TOC analyses on March 7-8, 2022 in the spring and on September 12-13, 2022 in the fall.

The associated QC for inorganics in sediments consists of laboratory blank (TOC only), a certified reference material (CRM – TOC only), field duplicate, and laboratory duplicate samples.

Precision of grain size is measured by the RPD of each sediment grain size class between environmental and field duplicate samples. The RPDs often indicate a high level of variability due to the nature of grain size analysis. With all sediment analyses, sample results may reflect heterogeneous composition rather than homogenous composition due to 1) sediment settling within the sample container (affects laboratory duplicate precision) and 2) heterogeneity of the sediment in the field (affects field duplicate precision).

For the 24 samples analyzed for grain size in the 2022 Monitoring Period, grain size class RPDs were acceptable in 15 of 24 (62.5%) size classes evaluated for field duplicate RPDs and in 23 of 24 (95.8%) size classes evaluated for laboratory duplicate RPDs.

All sediment grain size data were accepted and are useable.

Acceptability was met in 100% of QC samples for sediment TOC in the 2022 Monitoring Period.

Matrix spikes are not required for sediment TOC. Nevertheless, in the 2022 Monitoring Period, the subcontracted laboratory ran four MS and four MSD samples, all of which were within the laboratory's recovery limits and met the laboratory's RPD requirements. All sediment TOC data were accepted and are useable.

Toxicity

The Coalition collects samples for water column toxicity monitoring for four test species (*Ceriodaphnia dubia*, *Selenastrum capricornutum*, *Pimephales promelas*, and *Hyalella azteca*) and sediment toxicity to *Hyalella azteca*. Quality control for toxicity testing is based on the performance of the control tests (CNEG) and RPDs calculated from the environmental and field duplicate samples. Reference tests occur at the time of toxicity testing to assess the overall health of the organisms and predictability of responses to exposure.

Water Column Toxicity

During the 2022 Monitoring Period, field duplicate samples were collected for each event for test species scheduled for toxicity monitoring. Toxicity field duplicates were within the acceptability criteria in 100% of samples for all test species, and all CNEG tests met the acceptability criteria (Table 29).

Sediment Toxicity

Sediment samples were collected to test for toxicity on March 7-8, 2022 and September 12-13, 2022. A field duplicate sample was collected for each event and the RPDs were within 25%. Test acceptability was met in all CNEG tests for sediment (Table 29).

Corrective Actions

Corrective actions define the actions taken to stop the reoccurrence of non-conformities. In some cases, the Coalition addresses corrective action options with laboratories to improve QC measures that consistently demonstrate failure to meet MQOs.

During the 2022 Monitoring Period, field crews failed to collect nine DO, eight pH, nine SC, and eight water temperature measurements due to equipment failure (Field and Transport Completeness). On August 9, 2022 and on February 14, 2023, the multiparameter meter used for field measurements was not functional when deployed at multiple sites. As a result, field measurements could not be collected for eight of the 20 sites monitored during the August 9 event and for nine of the 20 sites monitored during the February 14 event. Field crews were reminded to include notes on field sheets documenting issues with collecting field parameters, including discharge.

Over the course of the 2022 Monitoring Period, there were a total of eight instances over six monitoring events in which field blank samples did not meet acceptability criteria. It was noted by analyzing laboratories that samples analyzed for ammonia as N and nitrate + nitrite as N collected during the December event had a yellow tint and contained sediment, suggesting that it was filled with environmental sample water. Samplers will receive a retraining on field blank collection procedures by October 2023. The situation continues to be monitored by the Coalition.

The incorrect station was sampled three times during the 2022 Monitoring Period. The samplers were unable to access the original station due to flooding and inaccessibility and attempted to find an alternative location on the same waterbody; they inadvertently went to a different waterbody. In the future, samplers will be instructed to record that they could not access the site and not collect a sample.

Table 16. WSJRWC field and transport and analytical completeness: environmental sample counts and percentages.

Samples collected during the 2022 Monitoring Period, sorted by matrix, method, and analyte. The table counts environmental grabs only; field duplicates are not included. Bolded rows represent analytes that did not meet the 90% completeness requirement.

Method	Matrix	Analyte	Environmental Samples Scheduled	Dry/Too Shallow/ Stagnant	Samples Collected	Extra Analysis[1]	Field and Transport Completeness (%)	Total Environmental Samples Analyzed	Analytical Completeness (%)
EPA 200.8	Water	Arsenic	210	39	162	3	95.7	165	100.0
EPA 200.8	Water	Boron	240	39	192	3	96.3	195	100.0
EPA 200.8	Water	Dissolved Cadmium	40	12	25	2	92.5	27	100.0
EPA 200.8	Water	Dissolved Copper	128	26	93	8	93.0	101	100.0
EPA 200.8	Water	Dissolved Lead	100	26	70	12	96.0	82	100.0
EPA 200.8	Water	Dissolved Nickel	60	14	42	12	93.3	55	100.0
EPA 200.8	Water	Dissolved Zinc	50	13	34	12	94.0	46	100.0
EPA 200.8	Water	Molybdenum	210	39	162	3	95.7	165	100.0
EPA 200.8	Water	Selenium	210	39	163	3	96.2	165	100.0
EPA 353.2	Water	Nitrate + Nitrite as N	110	35	70	12	95.5	82	100.0
EPA 549.2M	Water	Paraquat	55	13	40	9	96.4	49	100.0
EPA 615	**Water**	**Dichlorophenoxybutyric Acid, 2,4-**	**38**	**6**	**28**	**4**	**89.5**	**32**	**100.0**
EPA 625.1_NCI	Water	Bifenthrin	76	11	65	5	100.0	70	100.0
EPA 625.1_NCI	Water	Cyfluthrin, Total	67	8	59	4	100.0	63	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	86	10	76	6	100.0	82	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	67	5	62	4	100.0	66	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	75	10	64	4	98.7	68	100.0
EPA 625.1_NCI	Water	Fenpropathrin	33	5	28	6	100.0	34	100.0
EPA 625.1_NCI	Water	Permethrin, Total	62	5	56	4	98.4	60	100.0
EPA 8081A	Water	Chlorothalonil	33	6	27	2	100.0	29	100.0
EPA 8081A	Water	DDD(p,p')	6	6	0	52	100.0	52	100.0
EPA 8081A	Water	DDE(p,p')	57	12	45	7	100.0	52	100.0
EPA 8081A	Water	DDT(p,p')	18	6	12	40	100.0	52	100.0
EPA 8081A	**Water**	**Oxyfluorfen**	**63**	**14**	**42**	**9**	**88.9**	**51**	**100.0**
EPA 8141A	Water	Chlorpyrifos	NA	NA	NA	45	NA	45	100.0
EPA 8141A	Water	Diazinon	17	5	12	40	100.0	52	100.0
EPA 8141A	Water	Dichlorvos	3	0	3	2	100.0	5	100.0

Method	Matrix	Analyte	Environmental Samples Scheduled	Dry/too shallow/ Stagnant	Samples Collected	Extra Analysis[1]	Field and transport completeness (%)	Total environmental samples Analyzed	Analytical Completeness (%)
EPA 8141A	Water	Dimethoate	39	8	31	2	100.0	33	100.0
EPA 8141A	Water	Hexazinone	3	0	3	0	100.0	3	100.0
EPA 8141A	Water	Malathion	48	2	46	3	100.0	49	100.0
EPA 8141A	Water	Parathion, Methyl	6	0	6	6	100.0	12	100.0
EPA 8141A	**Water**	**Pendimethalin**	**31**	**10**	**17**	**5**	**87.1**	**22**	**100.0**
EPA 8141A	Water	Prometryn	5	0	5	1	100.0	6	100.0
EPA 8141A	Water	Simazine	7	3	4	6	100.0	10	100.0
EPA 8141A	Water	Trifluralin	7	2	5	3	100.0	8	100.0
EPA 821/R-02-012	Water	Ceriodaphnia dubia	96	24	69	3	96.9	72	100.0
EPA 821/R-02-012	Water	Pimephales promelas	32	10	19	2	90.6	21	100.0
EPA 821/R-02-012M	Water	Hyalella azteca	129	18	110	0	99.2	110	100.0
EPA 821/R-02-013	Water	Selenastrum capricornutum	91	22	66	4	96.7	70	100.0
EPA 8260BM	Water	Chloropicrin	4	1	3	2	100.0	5	100.0
EPA 8321A	Water	Carbaryl	13	2	11	2	100.0	13	100.0
EPA 8321A	Water	Diuron	52	7	43	4	96.2	47	100.0
EPA 8321A	Water	Imidacloprid	17	1	16	5	100.0	21	100.0
EPA 8321A	**Water**	**Linuron**	**1**	**0**	**0**	**1**	**0.0**	**1**	**100.0**
EPA 8321A	Water	Methomyl	14	2	12	5	100.0	17	100.0
NCL ME 340	Water	Clothianidin	3	0	3	0	100.0	3	100.0
NCL ME 340	Water	Cyprodinil	2	0	2	1	100.0	3	100.0
NCL ME 340	Water	Pyraclostrobin	12	2	10	1	100.0	11	100.0
SM 2130 B	Water	Turbidity	240	39	192	3	96.3	195	100.0
SM 2340 C	Water	Hardness as CaCO3	240	39	192	3	96.3	195	100.0
SM 2540 D	Water	Total Suspended Solids	240	39	192	3	96.3	195	100.0
SM 4500-NH3 B/C[2]	Water	Ammonia as N	90	27	58	11	94.4	69	100.0
SM 4500-P E[3]	Water	OrthoPhosphate as P	210	39	162	3	95.7	165	100.0
SM 5310 B	Water	Dissolved Organic Carbon	204	39	156	3	95.6	159	100.0
SM 5310 B	Water	Total Organic Carbon	210	39	162	3	95.7	165	100.0
SM 9223 B	Water	E. coli	240	39	192	3	96.3	195	100.0
EPA 600/R-99-064	Sediment	Hyalella azteca	20	3	17	0	100.0	17	100.0
EPA 8270C SIM	Sediment	Piperonyl Butoxide	5	0	5	0	100.0	5	100.0

Method	Matrix	Analyte	Environmental Samples Scheduled	Dry/too shallow/ Stagnant	Samples Collected	Extra Analysis[1]	Field and transport completeness (%)	Total environmental samples Analyzed	Analytical Completeness (%)
EPA 8270M_NCI	Sediment	Bifenthrin	5	0	5	0	100.0	5	100.0
EPA 8270M_NCI	Sediment	Chlorpyrifos	5	0	5	0	100.0	5	100.0
EPA 8270M_NCI	Sediment	Cyfluthrin, Total	5	0	5	0	100.0	5	100.0
EPA 8270M_NCI	Sediment	Cyhalothrin, Total lambda-	5	0	5	0	100.0	5	100.0
EPA 8270M_NCI	Sediment	Cypermethrin, Total	5	0	5	0	100.0	5	100.0
EPA 8270M_NCI	Sediment	Deltamethrin/Tralomethrin	5	0	5	0	100.0	5	100.0
EPA 8270M_NCI	Sediment	Esfenvalerate/Fenvalerate, Total	5	0	5	0	100.0	5	100.0
EPA 8270M_NCI	Sediment	Fenpropathrin	5	0	5	0	100.0	5	100.0
EPA 8270M_NCI	Sediment	Permethrin, Total	5	0	5	0	100.0	5	100.0
EPA 9060M	Sediment	Total Organic Carbon	20	3	17	0	100.0	17	100.0
Plumb, 1981, GS	Sediment	Clay	20	3	17	0	100.0	17	100.0
Plumb, 1981, GS	Sediment	Granule	20	3	17	0	100.0	17	100.0
Plumb, 1981, GS	Sediment	Pebble	80	12	68	0	100.0	68	100.0
Plumb, 1981, GS	Sediment	Sand	100	15	85	0	100.0	85	100.0
Plumb, 1981, GS	Sediment	Silt	20	3	17	0	100.0	17	100.0
		Total	**4730**	**860**	**3707**	**401**	**96.6**	**4108**	**100.0**

[1] Extra analysis indicates that the analyte was not scheduled to be sampled/analyzed but is included in the data set. Samples collected from Santa Fe Canal at Gun Club Road are counted as extra analyses.

[2] Some events were analyzed by SM 4500-NH3 BC v22.

[3] Some events were analyzed by SM 4500-P E v21,22.

Table 17. WSJRWC field and transport completeness: field parameter counts and percentages.

Samples collected during the 2022 Monitoring Period; sorted by analyte. Bolded rows represent analytes that did not meet 90% completeness requirement.

Method	Analyte	Samples Scheduled	Dry / too shallow / Stagnant	Extra	Total Measurements	Completeness (%)
Site Dependent [1]	Discharge, cfs	254	41	3	190	90.9
SM 4500-O	Dissolved Oxygen, mg/L	254	41	3	186	89.4
EPA 150.1	pH	254	41	3	187	89.8
EPA 120.1	Specific Conductivity, µS/cm	254	41	3	186	89.4
SM 2550	Temperature, °C	254	41	3	187	89.8
	Total	**1270**	**205**	**15**	**936**	89.8

[1]The "float method" is used for most sites. Alternatively, data will be obtained online for sites with gauging stations or rated weirs.
[2]During the January 10, 2023 sampling event, the discharge measurement for Poso Slough at Indiana Ave was recorded as the average observed flow due to a power failure that caused the flow gauge to be inactive.

Table 18. WSJRWC field QC completeness: total counts per analyte and completeness percentages.

Samples collected during the 2022 Monitoring Period, sorted by matrix, method, and analyte. The environmental sample count does not include the field duplicate. Completeness for each analyte that resulted in less than 5% is bolded.

Method	Matrix	Analyte	Total Environmental Samples	Total Field Duplicate Samples	Total Field Blank Samples	Total Environmental & Field QC Samples	Field Duplicate Completeness (%)	Field Blank Completeness (%)[1]
EPA 200.8	Water	Arsenic	165	12	12	189	7.3	7.3
EPA 200.8	Water	Boron	195	12	12	219	6.2	6.2
EPA 200.8	Water	Dissolved Cadmium	27	2	2	31	7.4	7.4
EPA 200.8	Water	Dissolved Copper	101	12	12	125	11.9	11.9
EPA 200.8	Water	Dissolved Lead	82	12	12	106	14.6	14.6
EPA 200.8	Water	Dissolved Nickel	55	12	12	79	21.8	21.8
EPA 200.8	Water	Dissolved Zinc	46	12	12	70	26.1	26.1
EPA 200.8	Water	Molybdenum	165	12	12	189	7.3	7.3
EPA 200.8	Water	Selenium	165	12	12	189	7.3	7.3
EPA 353.2	Water	Nitrate + Nitrite as N	82	12	12	106	14.6	14.6
EPA 549.2M	Water	Paraquat	49	11	11	71	22.4	22.4
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	32	6	6	44	18.8	18.8
EPA 625.1_NCI	Water	Bifenthrin	70	10	10	90	14.3	14.3
EPA 625.1_NCI	Water	Cyfluthrin, Total	63	10	10	83	15.9	15.9
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	82	11	11	104	13.4	13.4
EPA 625.1_NCI	Water	Cypermethrin, Total	66	9	9	84	13.6	13.6
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	68	10	10	88	14.7	14.7
EPA 625.1_NCI	Water	Fenpropathrin	34	7	7	48	20.6	20.6
EPA 625.1_NCI	Water	Permethrin, Total	60	11	11	82	18.3	18.3
EPA 8081A	Water	Chlorothalonil	29	6	6	41	20.7	20.7
EPA 8081A	Water	DDD(p,p')	52	6	6	64	11.5	11.5
EPA 8081A	Water	DDE(p,p')	52	6	6	64	11.5	11.5
EPA 8081A	Water	DDT(p,p')	52	6	6	64	11.5	11.5
EPA 8081A	Water	Oxyfluorfen	51	9	9	69	17.6	17.6
EPA 8141A	Water	Chlorpyrifos	45	12	12	69	26.7	26.7
EPA 8141A	Water	Diazinon	52	12	12	76	23.1	23.1
EPA 8141A	Water	Dichlorvos	5	2	2	9	40.0	40.0
EPA 8141A	Water	Dimethoate	33	8	8	49	24.2	24.2

Method	Matrix	Analyte	Total Environmental Samples	Total Field Duplicate Samples	Total Field Blank Samples	Total Environmental & Field QC Samples	Field Duplicate Completeness (%)	Field Blank Completeness (%)[1]
EPA 8141A	Water	Hexazinone	3	1	1	5	33.3	33.3
EPA 8141A	Water	Malathion	49	7	7	63	14.3	14.3
EPA 8141A	Water	Parathion, Methyl	12	6	6	24	50.0	50.0
EPA 8141A	Water	Pendimethalin	22	6	6	34	27.3	27.3
EPA 8141A	Water	Prometryn	6	2	2	10	33.3	33.3
EPA 8141A	Water	Simazine	10	6	6	22	60.0	60.0
EPA 8141A	Water	Trifluralin	8	4	4	16	50.0	50.0
EPA 821/R-02-012	Water	*Ceriodaphnia dubia*	72	9	NA	81	12.5	NA
EPA 821/R-02-012	Water	*Pimephales promelas*	21	2	NA	23	9.5	NA
EPA 821/R-02-012M	Water	*Hyalella azteca*	110	12	NA	122	10.9	NA
EPA 821/R-02-013	Water	*Selenastrum capricornutum*	70	10	NA	80	14.3	NA
EPA 8260BM	Water	Chloropicrin	5	3	3	11	60.0	60.0
EPA 8321A	Water	Carbaryl	13	3	3	19	23.1	23.1
EPA 8321A	Water	Diuron	47	11	11	69	23.4	23.4
EPA 8321A	Water	Imidacloprid	21	5	5	31	23.8	23.8
EPA 8321A	Water	Linuron	1	1	1	3	100.0	100.0
EPA 8321A	Water	Methomyl	17	7	7	31	41.2	41.2
NCL ME 340	Water	Clothianidin	3	1	1	5	33.3	33.3
NCL ME 340	Water	Cyprodinil	3	1	1	5	33.3	33.3
NCL ME 340	Water	Pyraclostrobin	11	2	2	15	18.2	18.2
SM 2130 B	Water	Turbidity	195	12	12	219	6.2	6.2
SM 2340 C	Water	Hardness as CaCO3	195	12	12	219	6.2	6.2
SM 2540 D	Water	Total Suspended Solids	195	12	12	219	6.2	6.2
SM 4500-NH3 B/C[1]	Water	Ammonia as N	69	12	12	93	17.4	17.4
SM 4500-P E[2]	Water	OrthoPhosphate as P	165	12	12	189	7.3	7.3
SM 5310 B	Water	Dissolved Organic Carbon	159	12	12	183	7.5	7.5
SM 5310 B	Water	Total Organic Carbon	165	12	12	189	7.3	7.3
SM 9223 B	Water	*E. coli*	195	12	12	219	6.2	6.2
EPA 600/R-99-064	Sediment	*Hyalella azteca*	17	2	NA	19	11.8	NA
EPA 8270C SIM	Sediment	Piperonyl Butoxide	5	NA	NA	5	NA	NA
EPA 8270M_NCI	Sediment	Bifenthrin	5	NA	NA	5	NA	NA

Method	Matrix	Analyte	Total Environmental Samples	Total Field Duplicate Samples	Total Field Blank Samples	Total Environmental & Field QC Samples	Field Duplicate Completeness (%)	Field Blank Completeness (%)[1]
EPA 8270M_NCI	Sediment	Chlorpyrifos	5	NA	NA	5	NA	NA
EPA 8270M_NCI	Sediment	Cyfluthrin, Total	5	NA	NA	5	NA	NA
EPA 8270M_NCI	Sediment	Cyhalothrin, Total lambda-	5	NA	NA	5	NA	NA
EPA 8270M_NCI	Sediment	Cypermethrin, Total	5	NA	NA	5	NA	NA
EPA 8270M_NCI	Sediment	Deltamethrin/Tralomethrin	5	NA	NA	5	NA	NA
EPA 8270M_NCI	Sediment	Esfenvalerate/Fenvalerate, Total	5	NA	NA	5	NA	NA
EPA 8270M_NCI	Sediment	Fenpropathrin	5	NA	NA	5	NA	NA
EPA 8270M_NCI	Sediment	Permethrin, Total	5	NA	NA	5	NA	NA
EPA 9060M	Sediment	Total Organic Carbon	17	2	NA	19	11.8	NA
Plumb, 1981, GS	Sediment	Clay	17	2	NA	19	11.8	NA
Plumb, 1981, GS	Sediment	Granule	17	2	NA	19	11.8	NA
Plumb, 1981, GS	Sediment	Pebble	68	8	NA	76	11.8	NA
Plumb, 1981, GS	Sediment	Sand	85	10	NA	95	11.8	NA
Plumb, 1981, GS	Sediment	Silt	17	2	NA	19	11.8	NA
		Total	**4108**	**485**	**424**	**5017**	**11.8**	**10.3**

NA: Not applicable; QC is not required for the constituent listed.
[1] Some events were analyzed by SM 4500-NH3 BC v22.
[2] Some events were analyzed by SM 4500-P E v21,22.

Table 19. WSJRWC summary of field blank QC sample evaluations.

Samples collected during the 2022 Monitoring Period, sorted by matrix, method, and analyte. Bolded rows represent analytes that did not meet 90% acceptability requirement.

Method	Matrix	Analyte[1]	FB Data Acceptability Criteria	Total FB Samples	FB Samples within Acceptability	Acceptability Met (%)
EPA 200.8	Water	Arsenic	< RL or 1/5 environmental sample	12	12	100.0
EPA 200.8	Water	Boron	< RL or 1/5 environmental sample	12	12	100.0
EPA 200.8	Water	Dissolved Cadmium	< RL or 1/5 environmental sample	2	2	100.0
EPA 200.8	**Water**	**Dissolved Copper**	**< RL or 1/5 environmental sample**	**12**	**9**	**75.0**
EPA 200.8	Water	Dissolved Lead	< RL or 1/5 environmental sample	12	12	100.0
EPA 200.8	Water	Dissolved Nickel	< RL or 1/5 environmental sample	12	12	100.0
EPA 200.8	Water	Dissolved Zinc	< RL or 1/5 environmental sample	12	11	91.7
EPA 200.8	Water	Molybdenum	< RL or 1/5 environmental sample	12	12	100.0
EPA 200.8	Water	Selenium	< RL or 1/5 environmental sample	12	12	100.0
EPA 353.2	Water	Nitrate + Nitrite as N	< RL or 1/5 environmental sample	12	11	91.7
EPA 549.2M	Water	Paraquat	< RL or 1/5 environmental sample	11	11	100.0
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	< RL or 1/5 environmental sample	6	6	100.0
EPA 625.1_NCI	Water	Bifenthrin	< RL or 1/5 environmental sample	10	10	100.0
EPA 625.1_NCI	Water	Cyfluthrin, Total	< RL or 1/5 environmental sample	10	10	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	< RL or 1/5 environmental sample	11	11	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	< RL or 1/5 environmental sample	9	9	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	< RL or 1/5 environmental sample	10	10	100.0
EPA 625.1_NCI	Water	Fenpropathrin	< RL or 1/5 environmental sample	7	7	100.0
EPA 625.1_NCI	Water	Permethrin, Total	< RL or 1/5 environmental sample	11	11	100.0
EPA 8081A	Water	Chlorothalonil	< RL or 1/5 environmental sample	6	6	100.0
EPA 8081A	Water	DDD(p,p')	< RL or 1/5 environmental sample	6	6	100.0
EPA 8081A	Water	DDE(p,p')	< RL or 1/5 environmental sample	6	6	100.0
EPA 8081A	Water	DDT(p,p')	< RL or 1/5 environmental sample	6	6	100.0
EPA 8081A	Water	Oxyfluorfen	< RL or 1/5 environmental sample	9	9	100.0
EPA 8141A	Water	Chlorpyrifos	< RL or 1/5 environmental sample	12	12	100.0
EPA 8141A	Water	Diazinon	< RL or 1/5 environmental sample	12	12	100.0
EPA 8141A	Water	Dichlorvos	< RL or 1/5 environmental sample	2	2	100.0
EPA 8141A	Water	Dimethoate	< RL or 1/5 environmental sample	8	8	100.0
EPA 8141A	Water	Hexazinone	< RL or 1/5 environmental sample	1	1	100.0
EPA 8141A	Water	Malathion	< RL or 1/5 environmental sample	7	7	100.0
EPA 8141A	Water	Parathion, Methyl	< RL or 1/5 environmental sample	6	6	100.0
EPA 8141A	Water	Pendimethalin	< RL or 1/5 environmental sample	6	6	100.0
EPA 8141A	Water	Prometryn	< RL or 1/5 environmental sample	2	2	100.0
EPA 8141A	Water	Simazine	< RL or 1/5 environmental sample	6	6	100.0
EPA 8141A	Water	Trifluralin	< RL or 1/5 environmental sample	4	4	100.0
EPA 8260BM	Water	Chloropicrin	< RL or 1/5 environmental sample	3	3	100.0
EPA 8321A	Water	Carbaryl	< RL or 1/5 environmental sample	3	3	100.0
EPA 8321A	Water	Diuron	< RL or 1/5 environmental sample	11	11	100.0
EPA 8321A	Water	Imidacloprid	< RL or 1/5 environmental sample	5	5	100.0
EPA 8321A	Water	Linuron	< RL or 1/5 environmental sample	1	1	100.0

Method	Matrix	Analyte[1]	FB Data Acceptability Criteria	Total FB Samples	FB Samples within Acceptability	Acceptability Met (%)
EPA 8321A	Water	Methomyl	< RL or 1/5 environmental sample	7	7	100.0
NCL ME 340	Water	Clothianidin	< RL or 1/5 environmental sample	1	1	100.0
NCL ME 340	Water	Cyprodinil	< RL or 1/5 environmental sample	1	1	100.0
NCL ME 340	Water	Pyraclostrobin	< RL or 1/5 environmental sample	2	2	100.0
SM 2130 B	Water	Turbidity	< RL or 1/5 environmental sample	12	11	91.7
SM 2340 C	Water	Hardness as $CaCO_3$	< RL or 1/5 environmental sample	12	12	100.0
SM 2540 D	Water	Total Suspended Solids	< RL or 1/5 environmental sample	12	12	100.0
SM 4500-NH3 B/C[2]	**Water**	**Ammonia as N**	**< RL or 1/5 environmental sample**	**12**	**10**	**83.3**
SM 4500-P E[3]	Water	OrthoPhosphate as P	< RL or 1/5 environmental sample	12	12	100.0
SM 5310 B	Water	Dissolved Organic Carbon	< RL or 1/5 environmental sample	12	11	91.7
SM 5310 B	Water	Total Organic Carbon	< RL or 1/5 environmental sample	12	11	91.7
SM 9223 B	Water	*E. coli*	< RL or 1/5 environmental sample	12	12	100.0
			Total	**424**	**414**	**97.6**

[1]Field blanks (FB) are not analyzed for sediment grain size, sediment pesticides, sediment TOC, and water column and sediment toxicity. These analytes and are not included in this table.
[2] Some events were analyzed by SM 4500-NH3 BC v22.
[3] Some events were analyzed by SM 4500-P E v21,22.

Table 20. WSJRWC summary of field duplicate QC sample evaluations.

Samples collected during the 2022 Monitoring Period, sorted by matrix, method, and analyte. Bolded rows represent analytes that did not meet 90% acceptability requirement.

Method	Matrix	Analyte	Duplicate Data Acceptability Criteria	Total Field Duplicate Samples	Field Duplicate Samples within Limit	Acceptability Met (%)
EPA 200.8	Water	Arsenic	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	12	100.0
EPA 200.8	Water	Boron	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	11	91.7
EPA 200.8	Water	Dissolved Cadmium	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	2	2	100.0
EPA 200.8	Water	Dissolved Copper	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	12	100.0
EPA 200.8	Water	Dissolved Lead	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	12	100.0
EPA 200.8	Water	Dissolved Nickel	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	12	100.0
EPA 200.8	Water	Dissolved Zinc	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	12	100.0
EPA 200.8	Water	Molybdenum	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	11	91.7
EPA 200.8	Water	Selenium	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	12	100.0
EPA 353.2	**Water**	**Nitrate + Nitrite as N**	**RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL**	**12**	**10**	**83.3**
EPA 549.2M	Water	Paraquat	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	11	11	100.0
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	6	6	100.0
EPA 625.1_NCI	Water	Bifenthrin	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	10	10	100.0
EPA 625.1_NCI	Water	Cyfluthrin, Total	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	10	10	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	11	11	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	9	9	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	10	10	100.0
EPA 625.1_NCI	Water	Fenpropathrin	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	7	7	100.0
EPA 625.1_NCI	Water	Permethrin, Total	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	11	11	100.0
EPA 8081A	Water	Chlorothalonil	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	6	6	100.0
EPA 8081A	Water	DDD(p,p')	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	6	6	100.0
EPA 8081A	Water	DDE(p,p')	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	6	6	100.0
EPA 8081A	Water	DDT(p,p')	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	6	6	100.0
EPA 8081A	Water	Oxyfluorfen	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	9	9	100.0
EPA 8141A	Water	Chlorpyrifos	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	12	100.0
EPA 8141A	Water	Diazinon	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	12	12	100.0
EPA 8141A	Water	Dichlorvos	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	2	2	100.0
EPA 8141A	Water	Dimethoate	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	8	8	100.0
EPA 8141A	Water	Hexazinone	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	1	1	100.0
EPA 8141A	Water	Malathion	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	7	7	100.0
EPA 8141A	Water	Parathion, Methyl	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	6	6	100.0
EPA 8141A	Water	Pendimethalin	RPD ≤ 25 if $\lvert$Difference$\rvert$ ≥ RL	6	6	100.0

Method	Matrix	Analyte	Duplicate Data Acceptability Criteria	Total Field Duplicate Samples	Field Duplicate Samples within Limit	Acceptability Met (%)
EPA 8141A	Water	Prometryn	RPD ≤ 25 if |Difference| ≥ RL	2	2	100.0
EPA 8141A	Water	Simazine	RPD ≤ 25 if |Difference| ≥ RL	6	6	100.0
EPA 8141A	Water	Trifluralin	RPD ≤ 25 if |Difference| ≥ RL	4	4	100.0
EPA 821/R-02-012	Water	*Ceriodaphnia dubia*	RPD ≤ 25	9	9	100.0
EPA 821/R-02-012	Water	*Pimephales promelas*	RPD ≤ 25	2	2	100.0
EPA 821/R-02-012M	Water	*Hyalella azteca*	RPD ≤ 25	12	12	100.0
EPA 821/R-02-013	Water	*Selenastrum capricornutum*	RPD ≤ 25	10	10	100.0
EPA 8260BM	Water	Chloropicrin	RPD ≤ 25 if |Difference| ≥ RL	3	3	100.0
EPA 8321A	Water	Carbaryl	RPD ≤ 25 if |Difference| ≥ RL	3	3	100.0
EPA 8321A	Water	Diuron	RPD ≤ 25 if |Difference| ≥ RL	11	11	100.0
EPA 8321A	Water	Imidacloprid	RPD ≤ 25 if |Difference| ≥ RL	5	5	100.0
EPA 8321A	Water	Linuron	RPD ≤ 25 if |Difference| ≥ RL	1	1	100.0
EPA 8321A	Water	Methomyl	RPD ≤ 25 if |Difference| ≥ RL	7	7	100.0
NCL ME 340	Water	Clothianidin	RPD ≤ 25 if |Difference| ≥ RL	1	1	100.0
NCL ME 340	Water	Cyprodinil	RPD ≤ 25 if |Difference| ≥ RL	1	1	100.0
NCL ME 340	Water	Pyraclostrobin	RPD ≤ 25 if |Difference| ≥ RL	2	2	100.0
SM 2130 B	Water	Turbidity	RPD ≤ 25 if |Difference| ≥ RL	12	11	91.7
SM 2340 C	Water	Hardness as CaCO3	RPD ≤ 25 if |Difference| ≥ RL	12	12	100.0
SM 2540 D	**Water**	**Total Suspended Solids**	**RPD ≤ 25 if |Difference| ≥ RL**	**12**	**9**	**75.0**
SM 4500-NH3 B/C[1]	Water	Ammonia as N	RPD ≤ 25 if |Difference| ≥ RL	12	11	91.7
SM 4500-P E[2]	Water	OrthoPhosphate as P	RPD ≤ 25 if |Difference| ≥ RL	12	12	100.0
SM 5310 B	Water	Dissolved Organic Carbon	RPD ≤ 25 if |Difference| ≥ RL	12	12	100.0
SM 5310 B	Water	Total Organic Carbon	RPD ≤ 25 if |Difference| ≥ RL	12	12	100.0
SM 9223 B	**Water**	***E. coli***	**RPD ≤ 25 if |Difference| ≥ RL**	**12**	**10**	**83.3**
EPA 600/R-99-064	Sediment	*Hyalella azteca*	RPD ≤ 25	2	2	100.0
EPA 9060M	Sediment	Total Organic Carbon	RPD ≤ 25 if |Difference| ≥ RL	2	2	100.0
Plumb, 1981, GS	**Sediment**	**Clay**	**RPD ≤ 25 if |Difference| ≥ RL**	**2**	**1**	**50.0**
Plumb, 1981, GS	**Sediment**	**Granule**	**RPD ≤ 25 if |Difference| ≥ RL**	**2**	**0**	**0.0**
Plumb, 1981, GS	**Sediment**	**Pebble**	**RPD ≤ 25 if |Difference| ≥ RL**	**8**	**7**	**87.5**
Plumb, 1981, GS	**Sediment**	**Sand**	**RPD ≤ 25 if |Difference| ≥ RL**	**10**	**5**	**50.0**
Plumb, 1981, GS	Sediment	Silt	RPD ≤ 25 if |Difference| ≥ RL	2	2	100.0
			Total	485	465	95.9

[1] Some events were analyzed by SM 4500-NH3 BC v22.

[2] Some events were analyzed by SM 4500-P E v21,22.

274

Table 21. WSJRWC summary of laboratory blank QC sample evaluations.

Samples analyzed in batches with samples collected during the 2022 Monitoring Period, sorted by matrix, method, and analyte. Bolded rows represent analytes that did not meet 90% acceptability requirement.

Method	Matrix	Analyte[1]	LB Data Acceptability Criteria	Total LB Samples	LB Samples within Limits	Acceptability Met (%)
EPA 200.8	Water	Arsenic	< MDL or, if n≥3, avg ± 2 s.d. <RL	17	17	100.0
EPA 200.8	Water	Boron	< MDL or, if n≥3, avg ± 2 s.d. <RL	18	18	100.0
EPA 200.8	Water	Dissolved Cadmium	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 200.8	Water	Dissolved Copper	< MDL or, if n≥3, avg ± 2 s.d. <RL	12	12	100.0
EPA 200.8	Water	Dissolved Lead	< MDL or, if n≥3, avg ± 2 s.d. <RL	12	12	100.0
EPA 200.8	Water	Dissolved Nickel	< MDL or, if n≥3, avg ± 2 s.d. <RL	12	12	100.0
EPA 200.8	Water	Dissolved Zinc	< MDL or, if n≥3, avg ± 2 s.d. <RL	12	12	100.0
EPA 200.8	Water	Molybdenum	< MDL or, if n≥3, avg ± 2 s.d. <RL	17	17	100.0
EPA 200.8	Water	Selenium	< MDL or, if n≥3, avg ± 2 s.d. <RL	18	18	100.0
EPA 353.2	Water	Nitrate + Nitrite as N	< MDL or, if n≥3, avg ± 2 s.d. <RL	15	15	100.0
EPA 549.2M	Water	Paraquat	< RL	11	11	100.0
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	< RL	7	7	100.0
EPA 625.1_NCI	Water	Bifenthrin	< MDL or, if n≥3, avg ± 2 s.d. <RL	13	13	100.0
EPA 625.1_NCI	Water	Cyfluthrin, Total	< MDL or, if n≥3, avg ± 2 s.d. <RL	13	13	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	< MDL or, if n≥3, avg ± 2 s.d. <RL	14	14	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	< MDL or, if n≥3, avg ± 2 s.d. <RL	12	12	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	< RL or 1/5 environmental sample	13	13	100.0
EPA 625.1_NCI	Water	Fenpropathrin	< MDL or, if n≥3, avg ± 2 s.d. <RL	10	10	100.0
EPA 625.1_NCI	Water	Permethrin, Total	< MDL or, if n≥3, avg ± 2 s.d. <RL	14	14	100.0
EPA 8081A	Water	Chlorothalonil	< MDL or, if n≥3, avg ± 2 s.d. <RL	7	7	100.0
EPA 8081A	Water	DDD(p,p')	< MDL or, if n≥3, avg ± 2 s.d. <RL	7	7	100.0
EPA 8081A	Water	DDE(p,p')	< MDL or, if n≥3, avg ± 2 s.d. <RL	7	7	100.0
EPA 8081A	Water	DDT(p,p')	< MDL or, if n≥3, avg ± 2 s.d. <RL	7	7	100.0
EPA 8081A	Water	Oxyfluorfen	< MDL or, if n≥3, avg ± 2 s.d. <RL	10	10	100.0
EPA 8141A	Water	Chlorpyrifos	< MDL or, if n≥3, avg ± 2 s.d. <RL	12	12	100.0
EPA 8141A	Water	Diazinon	< MDL or, if n≥3, avg ± 2 s.d. <RL	12	12	100.0
EPA 8141A	Water	Dichlorvos	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8141A	Water	Dimethoate	< MDL or, if n≥3, avg ± 2 s.d. <RL	8	8	100.0
EPA 8141A	Water	Hexazinone	< MDL or, if n≥3, avg ± 2 s.d. <RL	1	1	100.0
EPA 8141A	Water	Malathion	< MDL or, if n≥3, avg ± 2 s.d. <RL	7	7	100.0
EPA 8141A	Water	Parathion, Methyl	< MDL or, if n≥3, avg ± 2 s.d. <RL	6	6	100.0
EPA 8141A	Water	Pendimethalin	< MDL or, if n≥3, avg ± 2 s.d. <RL	6	6	100.0
EPA 8141A	Water	Prometryn	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8141A	Water	Simazine	< MDL or, if n≥3, avg ± 2 s.d. <RL	6	6	100.0
EPA 8141A	Water	Trifluralin	< MDL or, if n≥3, avg ± 2 s.d. <RL	4	4	100.0
EPA 8260BM	Water	Chloropicrin	< RL	3	3	100.0
EPA 8321A	Water	Carbaryl	< MDL or, if n≥3, avg ± 2 s.d. <RL	3	3	100.0
EPA 8321A	Water	Diuron	< MDL or, if n≥3, avg ± 2 s.d. <RL	11	11	100.0
EPA 8321A	Water	Imidacloprid	< MDL or, if n≥3, avg ± 2 s.d. <RL	5	5	100.0
EPA 8321A	Water	Linuron	< MDL or, if n≥3, avg ± 2 s.d. <RL	1	1	100.0
EPA 8321A	Water	Methomyl	< MDL or, if n≥3, avg ± 2 s.d. <RL	7	7	100.0

Method	Matrix	Analyte[1]	LB Data Acceptability Criteria	Total LB Samples	LB Samples within Limits	Acceptability Met (%)
NCL ME 340	Water	Clothianidin	< RL	1	1	100.0
NCL ME 340	Water	Cyprodinil	< RL	1	1	100.0
NCL ME 340	Water	Pyraclostrobin	< RL	2	2	100.0
SM 2130 B	Water	Turbidity	< MDL or, if n≥3, avg ± 2 s.d. <RL	14	14	100.0
SM 2340 C	Water	Hardness as CaCO3	< MDL or, if n≥3, avg ± 2 s.d. <RL	20	20	100.0
SM 2540 D	Water	Total Suspended Solids	< MDL or, if n≥3, avg ± 2 s.d. <RL	17	17	100.0
SM 4500-NH3 B/C[2]	Water	Ammonia as N	< MDL or, if n≥3, avg ± 2 s.d. <RL	14	14	100.0
SM 4500-P E[3]	Water	OrthoPhosphate as P	< MDL or, if n≥3, avg ± 2 s.d. <RL	13	13	100.0
SM 5310 B	Water	Dissolved Organic Carbon	< MDL or, if n≥3, avg ± 2 s.d. <RL	18	18	100.0
SM 5310 B	Water	Total Organic Carbon	< MDL or, if n≥3, avg ± 2 s.d. <RL	18	17	94.4
SM 9223 B	Water	*E. coli*	< RL	12	12	100.0
EPA 8270C SIM	Sediment	Piperonyl Butoxide	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Bifenthrin	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Chlorpyrifos	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Cyfluthrin, Total	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Cyhalothrin, Total lambda-	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Cypermethrin, Total	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Deltamethrin/Tralomethrin	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Esfenvalerate/Fenvalerate, Total	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Fenpropathrin	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 8270M_NCI	Sediment	Permethrin, Total	< MDL or, if n≥3, avg ± 2 s.d. <RL	2	2	100.0
EPA 9060M	Sediment	Total Organic Carbon	< MDL or, if n≥3, avg ± 2 s.d. <RL	4	4	100.0
			Total	**530**	**529**	**99.8**

[1]Laboratory blanks (LB) are not analyzed for sediment grain size, sediment toxicity, and water column toxicity. These analytes are not included in table.
[2] Some events were analyzed by SM 4500-NH3 BC v22.
[3] Some events were analyzed by SM 4500-P E v21,22.

Table 22. WSJRWC summary of laboratory control spike (LCS) quality control sample evaluations.

Laboratory control spikes (LCS) and laboratory control spike duplicates analyzed in batches with samples collected from during the 2022 Monitoring Period, sorted by matrix, method, and analyte. Bolded rows represent analytes that did not meet 90% acceptability requirement.

Method[1]	Matrix	Analyte[2]	LCS Data Acceptability Criteria	Total LCS Samples	LCS Samples within Limits	Acceptability Met (%)
EPA 200.8	Water	Arsenic	PR 85-115	17	17	100.0
EPA 200.8	Water	Boron	PR 85-115	18	18	100.0
EPA 200.8	Water	Dissolved Cadmium	PR 85-115	2	2	100.0
EPA 200.8	Water	Dissolved Copper	PR 85-115	12	12	100.0
EPA 200.8	Water	Dissolved Lead	PR 85-115	12	12	100.0
EPA 200.8	Water	Dissolved Nickel	PR 85-115	12	12	100.0
EPA 200.8	Water	Dissolved Zinc	PR 85-115	12	12	100.0
EPA 200.8	Water	Molybdenum	PR 85-115	17	17	100.0
EPA 200.8	Water	Selenium	PR 85-115	18	18	100.0
EPA 353.2	Water	Nitrate + Nitrite as N	PR 90-110	15	15	100.0
EPA 549.2M	Water	Paraquat	PR 70-130	22	22	100.0
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	PR 63.6-149	14	13	92.9
EPA 625.1_NCI	Water	Bifenthrin	PR 50-150	25	25	100.0
EPA 625.1_NCI	Water	Cyfluthrin, Total	PR 50-150	25	25	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	PR 50-150	27	27	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	PR 50-150	23	23	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	PR 50-150	25	25	100.0
EPA 625.1_NCI	**Water**	**Fenpropathrin**	**PR 50-150**	**19**	**17**	**89.5**
EPA 625.1_NCI	Water	Permethrin, Total	PR 50-150	27	27	100.0
EPA 8081A	**Water**	**Chlorothalonil**	**PR 41-137**	**13**	**11**	**84.6**
EPA 8081A	Water	DDD(p,p')	PR 38-135	13	13	100.0
EPA 8081A	**Water**	**DDE(p,p')**	**PR 21-134**	**13**	**11**	**84.6**
EPA 8081A	**Water**	**DDT(p,p')**	**PR 18-145**	**13**	**11**	**84.6**
EPA 8081A	**Water**	**Oxyfluorfen**	**PR 44-138**	**19**	**17**	**89.5**
EPA 8141A	Water	Chlorpyrifos	PR 61-125	21	19	90.5
EPA 8141A	Water	Diazinon	PR 57-130	21	20	95.2
EPA 8141A	Water	Dichlorvos	PR 46-141	3	3	100.0
EPA 8141A	**Water**	**Dimethoate**	**PR 68-202**	**13**	**10**	**76.9**
EPA 8141A	Water	Hexazinone	PR 25-152	2	2	100.0
EPA 8141A	**Water**	**Malathion**	**PR 47-125**	**12**	**10**	**83.3**
EPA 8141A	Water	Parathion, Methyl	PR 55-164	10	10	100.0
EPA 8141A	**Water**	**Pendimethalin**	**PR 63-129**	**12**	**8**	**66.7**
EPA 8141A	Water	Prometryn	PR 45-143	4	4	100.0
EPA 8141A	Water	Simazine	PR 21-179	11	11	100.0
EPA 8141A	**Water**	**Trifluralin**	**PR 44-117**	**7**	**6**	**85.7**
EPA 8260BM	Water	Chloropicrin	PR 85.5-124	6	6	100.0
EPA 8321A	**Water**	**Carbaryl**	**PR 44-133**	**6**	**5**	**83.3**
EPA 8321A	Water	Diuron	PR 52-136	22	22	100.0
EPA 8321A	Water	Imidacloprid	PR 40-130	10	10	100.0

Method[1]	Matrix	Analyte[2]	LCS Data Acceptability Criteria	Total LCS Samples	LCS Samples within Limits	Acceptability Met (%)
EPA 8321A	Water	Linuron	PR 49-144	2	2	100.0
EPA 8321A	Water	Methomyl	PR 23-152	14	13	92.9
NCL ME 340	Water	Clothianidin	PR 47.6-112	2	2	100.0
NCL ME 340	Water	Cyprodinil	PR 34.6-90.9	2	2	100.0
NCL ME 340	Water	Pyraclostrobin	PR 41-93.1	4	4	100.0
SM 2130 B	Water	Turbidity	PR 90-110	14	14	100.0
SM 2340 C	Water	Hardness as CaCO3	PR 80-120	20	20	100.0
SM 2540 D	Water	Total Suspended Solids	PR 80-120	17	17	100.0
SM 4500-NH3 B/C [3]	Water	Ammonia as N	PR 90-110	28	28	100.0
SM 4500-P E[4]	Water	OrthoPhosphate as P	PR 90-110	13	13	100.0
SM 5310 B	Water	Dissolved Organic Carbon	PR 80-120	36	36	100.0
SM 5310 B	Water	Total Organic Carbon	PR 80-120	36	36	100.0
EPA 8270C SIM	Sediment	Piperonyl Butoxide	PR 50-150	3	3	100.0
EPA 8270M_NCI	Sediment	Bifenthrin	PR 51-136	3	3	100.0
EPA 8270M_NCI	Sediment	Chlorpyrifos	PR 50-149	3	3	100.0
EPA 8270M_NCI	Sediment	Cyfluthrin, Total	PR 50-150	3	3	100.0
EPA 8270M_NCI	Sediment	Cyhalothrin, Total lambda-	PR 57-141	3	3	100.0
EPA 8270M_NCI	Sediment	Cypermethrin, Total	PR 50-150	3	3	100.0
EPA 8270M_NCI	Sediment	Deltamethrin/Tralomethrin	PR 50-140	3	3	100.0
EPA 8270M_NCI	Sediment	Esfenvalerate/Fenvalerate, Total	PR 50-150	3	3	100.0
EPA 8270M_NCI	Sediment	Fenpropathrin	PR 53-138	3	3	100.0
EPA 8270M_NCI	Sediment	Permethrin, Total	PR 50-150	3	3	100.0
EPA 9060M	Sediment	Total Organic Carbon	PR 75-125	8	8	100.0
			Total	**799**	**773**	**96.7**

[1]Certified Reference Materials (CRMs) are used as the LCS or LCSD for TOC following the EPA 9060M method.
[2]Laboratory control spikes are not analyzed for *E. coli*, grain size, and water column and sediment toxicity analyses; these constituents are not included in table.
[3] Some events were analyzed by SM 4500-NH3 BC v22.
[4] Some events were analyzed by SM 4500-P E v21,22.

Table 23. WSJRWC summary of laboratory control spike duplicate (LCSD) quality control sample evaluations.

Laboratory control spike duplicates analyzed in batches with samples collected for the 2022 Monitoring Period, sorted by matrix, method, and analyte. Bolded rows represent analytes that did not meet 90% acceptability requirement.

Method	Matrix	Analyte[1]	Duplicate Data Acceptability Criteria	Total LCSD Samples	LCSD Samples within Limits	Acceptability Met (%)
EPA 549.2M	Water	Paraquat	RPD ≤ 30	11	11	100.0
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	RPD ≤ 30	7	7	100.0
EPA 625.1_NCI	Water	Bifenthrin	RPD ≤ 35	12	12	100.0
EPA 625.1_NCI	Water	Cyfluthrin, Total	RPD ≤ 35	12	12	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	RPD ≤ 35	13	13	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	RPD ≤ 35	11	11	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	RPD ≤ 35	12	12	100.0
EPA 625.1_NCI	Water	Fenpropathrin	RPD ≤ 35	9	9	100.0
EPA 625.1_NCI	Water	Permethrin, Total	RPD ≤ 35	13	13	100.0
EPA 8081A	Water	Chlorothalonil	RPD ≤ 25	6	6	100.0
EPA 8081A	**Water**	**DDD(p,p')**	**RPD ≤ 25**	**6**	**5**	**83.3**
EPA 8081A	**Water**	**DDE(p,p')**	**RPD ≤ 25**	**6**	**5**	**83.3**
EPA 8081A	Water	DDT(p,p')	RPD ≤ 25	6	6	100.0
EPA 8081A	**Water**	**Oxyfluorfen**	**RPD ≤ 25**	**9**	**8**	**88.9**
EPA 8141A	**Water**	**Chlorpyrifos**	**RPD ≤ 25**	**9**	**8**	**88.9**
EPA 8141A	**Water**	**Diazinon**	**RPD ≤ 25**	**9**	**8**	**88.9**
EPA 8141A	Water	Dichlorvos	RPD ≤ 25	1	1	100.0
EPA 8141A	Water	Dimethoate	RPD ≤ 25	5	5	100.0
EPA 8141A	Water	Hexazinone	RPD ≤ 25	1	1	100.0
EPA 8141A	Water	Malathion	RPD ≤ 25	5	5	100.0
EPA 8141A	Water	Parathion, Methyl	RPD ≤ 25	4	4	100.0
EPA 8141A	**Water**	**Pendimethalin**	**RPD ≤ 25**	**6**	**5**	**83.3**
EPA 8141A	Water	Prometryn	RPD ≤ 25	2	2	100.0
EPA 8141A	Water	Simazine	RPD ≤ 25	5	5	100.0
EPA 8141A	Water	Trifluralin	RPD ≤ 25	3	3	100.0
EPA 8260BM	Water	Chloropicrin	RPD ≤ 30	3	3	100.0
EPA 8321A	**Water**	**Carbaryl**	**RPD ≤ 25**	**3**	**1**	**33.3**
EPA 8321A	Water	Diuron	RPD ≤ 25	11	11	100.0
EPA 8321A	**Water**	**Imidacloprid**	**RPD ≤ 25**	**5**	**3**	**60.0**
EPA 8321A	Water	Linuron	RPD ≤ 25	1	1	100.0
EPA 8321A	**Water**	**Methomyl**	**RPD ≤ 25**	**7**	**5**	**71.4**
NCL ME 340	Water	Clothianidin	RPD ≤ 30	1	1	100.0
NCL ME 340	Water	Cyprodinil	RPD ≤ 30	1	1	100.0

Method	Matrix	Analyte[1]	Duplicate Data Acceptability Criteria	Total LCSD Samples	LCSD Samples within Limits	Acceptability Met (%)
NCL ME 340	Water	Pyraclostrobin	RPD ≤ 30	2	2	100.0
SM 4500-NH3 B/C [2]	Water	Ammonia as N	RPD ≤ 20	14	14	100.0
SM 5310 B	Water	Dissolved Organic Carbon	RPD ≤ 20	18	18	100.0
SM 5310 B	Water	Total Organic Carbon	RPD ≤ 20	18	18	100.0
EPA 8270C SIM	Sediment	Piperonyl Butoxide	RPD ≤ 35	1	1	100.0
EPA 8270M_NCI	Sediment	Bifenthrin	RPD ≤ 30	1	1	100.0
EPA 8270M_NCI	Sediment	Chlorpyrifos	RPD ≤ 30	1	1	100.0
EPA 8270M_NCI	Sediment	Cyfluthrin, Total	RPD ≤ 30	1	1	100.0
EPA 8270M_NCI	Sediment	Cyhalothrin, Total lambda-	RPD ≤ 30	1	1	100.0
EPA 8270M_NCI	Sediment	Cypermethrin, Total	RPD ≤ 30	1	1	100.0
EPA 8270M_NCI	Sediment	Deltamethrin/Tralomethrin	RPD ≤ 30	1	1	100.0
EPA 8270M_NCI	Sediment	Esfenvalerate/Fenvalerate, Total	RPD ≤ 30	1	1	100.0
EPA 8270M_NCI	Sediment	Fenpropathrin	RPD ≤ 30	1	1	100.0
EPA 8270M_NCI	Sediment	Permethrin, Total	RPD ≤ 30	1	1	100.0
EPA 9060M	Sediment	Total Organic Carbon	RPD ≤ 30	4	4	100.0
			Total	**281**	**269**	**95.7**

[1] Laboratory control spike duplicates are not run for all analytes. Analytes that do not have LCS duplicates are not included in table.
[2] Some events were analyzed by SM 4500-NH3 BC v22.

Table 24. WSJRWC summary of matrix spike QC sample evaluations.

Matrix spikes and matrix spike duplicates collected for the 2022 Monitoring Period, sorted by matrix, method, and analyte. Non project matrix spikes are included for batch Quality Assurance completeness purposes. Bolded rows represent analytes that did not meet 90% acceptability requirement.

Method	Matrix	Analyte[1]	MS Data Acceptability Criteria	Total MS Samples	MS Samples within Limits	Acceptability Met (%)
EPA 200.8	Water	Arsenic	PR 75-125	46	46	100.0
EPA 200.8	**Water**	**Boron**	**PR 75-125**	**54**	**38**	**70.4**
EPA 200.8	Water	Dissolved Cadmium	PR 75-125	6	6	100.0
EPA 200.8	Water	Dissolved Copper	PR 75-125	30	30	100.0
EPA 200.8	Water	Dissolved Lead	PR 75-125	30	30	100.0
EPA 200.8	Water	Dissolved Nickel	PR 75-125	30	30	100.0
EPA 200.8	Water	Dissolved Zinc	PR 75-125	30	30	100.0
EPA 200.8	Water	Molybdenum	PR 75-125	46	43	93.5
EPA 200.8	Water	Selenium	PR 75-125	48	46	95.8
EPA 353.2	**Water**	**Nitrate + Nitrite as N**	**PR 90-110**	**40**	**31**	**77.5**
EPA 549.2M	**Water**	**Paraquat**	**PR 70-130**	**22**	**6**	**27.3**
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	PR 63.6-149	13	13	100.0

Method	Matrix	Analyte[1]	MS Data Acceptability Criteria	Total MS Samples	MS Samples within Limits	Acceptability Met (%)
EPA 625.1_NCI	Water	Bifenthrin	PR 50-150	26	26	100.0
EPA 625.1_NCI	Water	Cyfluthrin, Total	PR 50-150	26	26	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	PR 50-150	28	28	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	PR 50-150	24	24	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	PR 50-150	26	26	100.0
EPA 625.1_NCI	Water	Fenpropathrin	PR 50-150	20	20	100.0
EPA 625.1_NCI	Water	Permethrin, Total	PR 50-150	28	28	100.0
EPA 8081A	Water	Chlorothalonil	PR 41-137	14	13	92.9
EPA 8081A	**Water**	**DDD(p,p')**	**PR 38-135**	**14**	**12**	**85.7**
EPA 8081A	Water	DDE(p,p')	PR 21-134	14	14	100.0
EPA 8081A	Water	DDT(p,p')	PR 18-145	14	14	100.0
EPA 8081A	Water	Oxyfluorfen	PR 44-138	18	17	94.4
EPA 8141A	**Water**	**Chlorpyrifos**	**PR 61-125**	**24**	**18**	**75.0**
EPA 8141A	**Water**	**Diazinon**	**PR 57-130**	**24**	**20**	**83.3**
EPA 8141A	Water	Dichlorvos	PR 46-141	4	4	100.0
EPA 8141A	**Water**	**Dimethoate**	**PR 68-202**	**16**	**9**	**56.3**
EPA 8141A	Water	Hexazinone	PR 25-152	2	2	100.0
EPA 8141A	Water	Malathion	PR 47-125	14	14	100.0
EPA 8141A	Water	Parathion, Methyl	PR 55-164	12	12	100.0
EPA 8141A	**Water**	**Pendimethalin**	**PR 63-129**	**12**	**8**	**66.7**
EPA 8141A	Water	Prometryn	PR 45-143	4	4	100.0
EPA 8141A	Water	Simazine	PR 21-179	12	12	100.0
EPA 8141A	**Water**	**Trifluralin**	**PR 44-117**	**8**	**6**	**75.0**
EPA 8260BM	**Water**	**Chloropicrin**	**PR 85.5-124**	**6**	**4**	**66.7**
EPA 8321A	Water	Carbaryl	PR 44-133	6	6	100.0
EPA 8321A	Water	Diuron	PR 52-136	22	21	95.5
EPA 8321A	**Water**	**Imidacloprid**	**PR 40-130**	**10**	**8**	**80.0**
EPA 8321A	**Water**	**Linuron**	**PR 49-144**	**2**	**1**	**50.0**
EPA 8321A	**Water**	**Methomyl**	**PR 23-152**	**14**	**11**	**78.6**
NCL ME 340	Water	Clothianidin	PR 47.6-112	2	2	100.0
NCL ME 340	Water	Cyprodinil	PR 34.6-90.9	2	2	100.0
NCL ME 340	Water	Pyraclostrobin	PR 41-93.1	4	4	100.0
SM 2340 C	Water	Hardness as CaCO3	PR 80-120	40	40	100.0
SM 4500-NH3 B/C[2]	Water	Ammonia as N	PR 70-130	28	28	100.0
SM 4500-P E[3]	Water	OrthoPhosphate as P	PR 90-110	26	25	96.2
SM 5310 B	Water	Dissolved Organic Carbon	PR 80-120	52	52	100.0
SM 5310 B	Water	Total Organic Carbon	PR 80-120	52	52	100.0

METHOD	MATRIX	ANALYTE[1]	MS DATA ACCEPTABILITY CRITERIA	TOTAL MS SAMPLES	MS SAMPLES WITHIN LIMITS	ACCEPTABILITY MET (%)
EPA 8270C SIM	**Sediment**	**Piperonyl Butoxide**	**PR 50-150**	**4**	**3**	**75.0**
EPA 8270M_NCI	**Sediment**	**Bifenthrin**	**PR 50-150**	**4**	**1**	**25.0**
EPA 8270M_NCI	**Sediment**	**Chlorpyrifos**	**PR 50-150**	**4**	**2**	**50.0**
EPA 8270M_NCI	Sediment	Cyfluthrin, Total	PR 50-150	4	4	100.0
EPA 8270M_NCI	**Sediment**	**Cyhalothrin, Total lambda-**	**PR 50-150**	**4**	**2**	**50.0**
EPA 8270M_NCI	**Sediment**	**Cypermethrin, Total**	**PR 50-150**	**4**	**3**	**75.0**
EPA 8270M_NCI	Sediment	Deltamethrin/Tralomethrin	PR 50-150	4	4	100.0
EPA 8270M_NCI	Sediment	Esfenvalerate/Fenvalerate, Total	PR 50-150	4	4	100.0
EPA 8270M_NCI	**Sediment**	**Fenpropathrin**	**PR 50-150**	**4**	**2**	**50.0**
EPA 8270M_NCI	**Sediment**	**Permethrin, Total**	**PR 50-150**	**4**	**2**	**50.0**
EPA 9060M	Sediment	Total Organic Carbon	PR 70-130	8	8	100.0
			Total	**1093**	**997**	**91.2**

[1]Matrix spikes are not analyzed for E. coli, sediment grain size, turbidity, TSS, and water column and sediment toxicity. These analytes and are not included in the table.

[2] Some events were analyzed by SM 4500-NH3 BC v22.

[3] Some events were analyzed by SM 4500-P E v21,22.

Table 25. WSJRWC summary of matrix spike duplicate QC sample evaluations.

Matrix spike duplicates collected for the 2022 Monitoring Period. Non project matrix spike duplicates are included for batch Quality Assurance completeness purposes. Evaluations are sorted by matrix, method, and analyte. Bolded rows represent analytes that did not meet 90% acceptability requirement.

METHOD	MATRIX	ANALYTE[1]	DUPLICATE DATA ACCEPTABILITY CRITERIA	TOTAL MSD SAMPLES	MSD SAMPLES WITHIN LIMITS	ACCEPTABILITY MET (%)
EPA 200.8	Water	Arsenic	RPD ≤ 20	23	23	100.0
EPA 200.8	Water	Boron	RPD ≤ 20	27	27	100.0
EPA 200.8	Water	Dissolved Cadmium	RPD ≤ 20	3	3	100.0
EPA 200.8	Water	Dissolved Copper	RPD ≤ 20	15	15	100.0
EPA 200.8	Water	Dissolved Lead	RPD ≤ 20	15	15	100.0
EPA 200.8	Water	Dissolved Nickel	RPD ≤ 20	15	15	100.0
EPA 200.8	Water	Dissolved Zinc	RPD ≤ 20	15	15	100.0
EPA 200.8	Water	Molybdenum	RPD ≤ 20	23	23	100.0
EPA 200.8	Water	Selenium	RPD ≤ 20	24	24	100.0
EPA 353.2	Water	Nitrate + Nitrite as N	RPD ≤ 20	20	20	100.0
EPA 549.2M	Water	Paraquat	RPD ≤ 30	10	10	100.0
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	RPD ≤ 30	6	6	100.0
EPA 625.1_NCI	Water	Bifenthrin	RPD ≤ 35	13	13	100.0

METHOD	MATRIX	ANALYTE[1]	DUPLICATE DATA ACCEPTABILITY CRITERIA	TOTAL MSD SAMPLES	MSD SAMPLES WITHIN LIMITS	ACCEPTABILITY MET (%)
EPA 625.1_NCI	Water	Cyfluthrin, Total	RPD ≤ 35	13	13	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	RPD ≤ 35	14	14	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	RPD ≤ 35	12	12	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	RPD ≤ 35	13	13	100.0
EPA 625.1_NCI	Water	Fenpropathrin	RPD ≤ 35	10	10	100.0
EPA 625.1_NCI	Water	Permethrin, Total	RPD ≤ 35	14	14	100.0
EPA 8081A	Water	Chlorothalonil	RPD ≤ 25	7	7	100.0
EPA 8081A	Water	DDD(p,p')	RPD ≤ 25	7	7	100.0
EPA 8081A	Water	DDE(p,p')	RPD ≤ 25	7	7	100.0
EPA 8081A	Water	DDT(p,p')	RPD ≤ 25	7	7	100.0
EPA 8081A	Water	Oxyfluorfen	RPD ≤ 25	9	9	100.0
EPA 8141A	**Water**	**Chlorpyrifos**	**RPD ≤ 25**	**12**	**10**	**83.3**
EPA 8141A	**Water**	**Diazinon**	**RPD ≤ 25**	**12**	**10**	**83.3**
EPA 8141A	**Water**	**Dichlorvos**	**RPD ≤ 25**	**2**	**1**	**50.0**
EPA 8141A	**Water**	**Dimethoate**	**RPD ≤ 25**	**8**	**7**	**87.5**
EPA 8141A	Water	Hexazinone	RPD ≤ 25	1	1	100.0
EPA 8141A	Water	Malathion	RPD ≤ 25	7	7	100.0
EPA 8141A	Water	Parathion, Methyl	RPD ≤ 25	6	6	100.0
EPA 8141A	**Water**	**Pendimethalin**	**RPD ≤ 25**	**6**	**4**	**66.7**
EPA 8141A	Water	Prometryn	RPD ≤ 25	2	2	100.0
EPA 8141A	**Water**	**Simazine**	**RPD ≤ 25**	**6**	**5**	**83.3**
EPA 8141A	Water	Trifluralin	RPD ≤ 25	4	4	100.0
EPA 8260BM	Water	Chloropicrin	RPD ≤ 30	3	3	100.0
EPA 8321A	**Water**	**Carbaryl**	**RPD ≤ 25**	**3**	**2**	**66.7**
EPA 8321A	Water	Diuron	RPD ≤ 25	11	11	100.0
EPA 8321A	**Water**	**Imidacloprid**	**RPD ≤ 25**	**5**	**4**	**80.0**
EPA 8321A	Water	Linuron	RPD ≤ 25	1	1	100.0
EPA 8321A	**Water**	**Methomyl**	**RPD ≤ 25**	**7**	**5**	**71.4**
NCL ME 340	Water	Clothianidin	RPD ≤ 30	1	1	100.0
NCL ME 340	Water	Cyprodinil	RPD ≤ 30	1	1	100.0
NCL ME 340	Water	Pyraclostrobin	RPD ≤ 30	2	2	100.0
SM 2340 C	Water	Hardness as CaCO3	RPD ≤ 20	20	20	100.0
SM 4500-NH3 B/C [2]	Water	Ammonia as N	RPD ≤ 20	14	14	100.0
SM 4500-P E [3]	Water	OrthoPhosphate as P	RPD ≤ 20	13	13	100.0
SM 5310 B	Water	Dissolved Organic Carbon	RPD ≤ 20	26	26	100.0

METHOD	MATRIX	ANALYTE[1]	DUPLICATE DATA ACCEPTABILITY CRITERIA	TOTAL MSD SAMPLES	MSD SAMPLES WITHIN LIMITS	ACCEPTABILITY MET (%)
SM 5310 B	Water	Total Organic Carbon	RPD ≤ 20	26	26	100.0
EPA 8270C SIM	**Sediment**	**Piperonyl Butoxide**	**RPD ≤ 35**	**2**	**1**	**50.0**
EPA 8270M_NCI	Sediment	Bifenthrin	RPD ≤ 30	2	2	100.0
EPA 8270M_NCI	Sediment	Chlorpyrifos	RPD ≤ 30	2	2	100.0
EPA 8270M_NCI	Sediment	Cyfluthrin, Total	RPD ≤ 30	2	2	100.0
EPA 8270M_NCI	Sediment	Cyhalothrin, Total lambda-	RPD ≤ 30	2	2	100.0
EPA 8270M_NCI	Sediment	Cypermethrin, Total	RPD ≤ 30	2	2	100.0
EPA 8270M_NCI	Sediment	Deltamethrin/Tralomethrin	RPD ≤ 30	2	2	100.0
EPA 8270M_NCI	Sediment	Esfenvalerate/Fenvalerate, Total	RPD ≤ 30	2	2	100.0
EPA 8270M_NCI	Sediment	Fenpropathrin	RPD ≤ 30	2	2	100.0
EPA 8270M_NCI	Sediment	Permethrin, Total	RPD ≤ 30	2	2	100.0
EPA 9060M	Sediment	Total Organic Carbon	RPD ≤ 30	4	4	100.0
			Total	**545**	**531**	**97.4**

[1]Matrix spikes are not analyzed for E. coli, sediment grain size, turbidity, TSS, and water column and sediment toxicity. These analytes and are not included in the table.
[2] Some events were analyzed by SM 4500-NH3 BC v22.
[3] Some events were analyzed by SM 4500-P E v21,22.

Table 26. WSJRWC summary of laboratory duplicate QC sample evaluations.

Laboratory duplicates were analyzed in batches with samples collected for the 2022 Monitoring Period. Non-project samples are included for batch Quality Assurance completeness purposes. Evaluations sorted by matrix, method, and analyte. Bolded rows represent analytes that did not meet 90% acceptability requirement.

METHOD	MATRIX	ANALYTE[1]	DUPLICATE DATA ACCEPTABILITY CRITERIA	TOTAL LABORATORY DUPLICATE SAMPLES	LABORATORY DUPLICATE SAMPLES WITHIN LIMIT	ACCEPTABILITY MET (%)
SM 2130 B	Water	Turbidity	RPD ≤ 20 if |Difference| ≥ RL	14	14	100.0
SM 2540 D	Water	Total Suspended Solids	RPD ≤ 20	22	22	100.0
SM 9223 B	Water	*E. coli*	R_{log} ≤ 0.41	12	12	100.0
Plumb, 1981, GS	Sediment	Clay	RPD ≤ 20 if result > 10x MDL	1	1	100.0
Plumb, 1981, GS	**Sediment**	**Granule**	**RPD ≤ 20 if result > 10x MDL**	**2**	**1**	**50.0**
Plumb, 1981, GS	Sediment	Pebble	RPD ≤ 20 if result > 10x MDL	8	8	100.0
Plumb, 1981, GS	Sediment	Sand	RPD ≤ 20 if result > 10x MDL	10	10	100.0
Plumb, 1981, GS	Sediment	Silt	RPD ≤ 20 if result > 10x MDL	1	1	100.0
SM 2130 B	Water	Turbidity	RPD ≤ 20 if |Difference| ≥ RL	14	14	100.0
SM 2540 D	Water	Total Suspended Solids	RPD ≤ 20	22	22	100.0
SM 9223 B	Water	*E. coli*	R_{log} ≤ 0.41	12	12	100.0
			Total	**70**	**69**	**98.6**

[1] Laboratory duplicates that are performed on environmental sample volume are not run for all analytes. Analytes that do not have these duplicates are not included in the table.

Table 27. WSJRWC summary of surrogate recovery QC sample evaluations.

Surrogates were run with samples collected and Laboratory Quality Assurance (LABQA) samples analyzed for the 2022 Monitoring Period for all organics except paraquat and glyphosate. Evaluations are sorted by matrix, method, and analyte. Bolded rows represent analytes that did not meet 90% acceptability requirement.

Method	Matrix	Analyte	Surrogate Data Acceptability Criteria	Total Surrogate Samples	Surrogates within Limits	Acceptability Met
EPA 615	Water	Dichlorophenoxyacetic Acid, 2,3- (Surrogate)	PR 62.8-146	78	76	97.4
EPA 625.1_NCI	Water	Esfenvalerate-d_6, Total (Surrogate)	PR 50-150	216	210	97.2
EPA 8081A	Water	PCB 209 (Surrogate)	PR 16-146	193	186	96.4
EPA 8081A	Water	Tetrachloro-m-xylene (Surrogate)	PR 15-98	193	188	97.4
EPA 8141A	**Water**	**Tributylphosphate (Surrogate)**	**PR 60-150**	**209**	**173**	**82.8**
EPA 8141A	**Water**	**Triphenyl phosphate (Surrogate)**	**PR 56-129**	**209**	**171**	**81.8**
EPA 8260BM	Water	Toluene-d_8 (Surrogate)	PR 75.7-128	26	26	100.0
EPA 8321A	Water	Tributylphosphate (Surrogate)	PR 36-140	146	141	96.6
NCL ME 340	Water	Imidacloprid-d_4 (Surrogate)	PR 53.4-115	35	34	97.1
EPA 8270C SIM	**Sediment**	**Esfenvalerate-d_6, Total (Surrogate)**	**PR 50-150**	**9**	**7**	**77.8**
EPA 8270M_NCI	Sediment	Esfenvalerate-d_6, Total (Surrogate)	PR 50-150	9	9	100.0
EPA 8270C SIM	Blank Matrix	Esfenvalerate-d_6, Total (Surrogate)	PR 77-150	5	5	100.0
EPA 8270M_NCI	Blank Matrix	Esfenvalerate-d_6, Total (Surrogate)	PR 62-138	5	5	100.0
			Total	**1333**	**1231**	**92.3**

Table 28. WSJRWC summary of holding time evaluations for environmental, field blank, field duplicate and matrix spike samples.

Samples collected during 2022 Monitoring Period; sorted by matrix method and analyte. Bolded rows represent analytes that did not meet the 90% acceptability requirement. Matrix spike duplicates are not included in the counts.

Method	Matrix	Analyte	Hold time	Total Samples Analyzed	Samples Analyzed within Hold time	Acceptability Met (%)
EPA 200.8	Water	Arsenic	6 months	212	212	100.0
EPA 200.8	Water	Boron	6 months	246	246	100.0
EPA 200.8	Water	Dissolved Cadmium	6 months	34	34	100.0
EPA 200.8	Water	Dissolved Copper	6 months	140	140	100.0
EPA 200.8	Water	Dissolved Lead	6 months	121	121	100.0
EPA 200.8	Water	Dissolved Nickel	6 months	94	94	100.0
EPA 200.8	Water	Dissolved Zinc	6 months	85	85	100.0
EPA 200.8	Water	Molybdenum	6 months	212	212	100.0
EPA 200.8	Water	Selenium	6 months	213	213	100.0
EPA 353.2	Water	Nitrate + Nitrite as N	28 days	126	126	100.0
EPA 549.2M	Water	Paraquat	Extract within 7 days, analyze within 21 days	83	83	100.0

Method	Matrix	Analyte	Hold time	Total Samples Analyzed	Samples Analyzed within Hold time	Acceptability Met (%)
EPA 615	Water	Dichlorophenoxybutyric Acid, 2,4-	Extract within 7 days, analyze within 40 days	51	49	96.1
EPA 625.1_NCI	Water	Bifenthrin	Extract within 7 days, analyze within 40 days	103	103	100.0
EPA 625.1_NCI	Water	Cyfluthrin, Total	Extract within 7 days, analyze within 40 days	96	96	100.0
EPA 625.1_NCI	Water	Cyhalothrin, Total lambda-	Extract within 3 days, analyze within 40 days	118	118	100.0
EPA 625.1_NCI	Water	Cypermethrin, Total	Extract within 7 days, analyze within 40 days	96	96	100.0
EPA 625.1_NCI	Water	Esfenvalerate/Fenvalerate, Total	Extract within 7 days, analyze within 40 days	101	101	100.0
EPA 625.1_NCI	Water	Fenpropathrin	Extract within 7 days, analyze within 40 days	58	58	100.0
EPA 625.1_NCI	Water	Permethrin, Total	Extract within 3 days, analyze within 40 days	96	96	100.0
EPA 8081A	Water	Chlorothalonil	Extract within 7 days, analyze within 40 days	48	45	93.8
EPA 8081A	Water	DDD(p,p')	Extract within 7 days, analyze within 40 days	71	68	95.8
EPA 8081A	Water	DDE(p,p')	Extract within 7 days, analyze within 40 days	71	68	95.8
EPA 8081A	Water	DDT(p,p')	Extract within 7 days, analyze within 40 days	71	68	95.8
EPA 8081A	Water	Oxyfluorfen	Extract within 7 days, analyze within 40 days	78	74	94.9
EPA 8141A	Water	Chlorpyrifos	Extract within 7 days, analyze within 40 days	81	81	100.0
EPA 8141A	Water	Diazinon	Extract within 7 days, analyze within 40 days	88	88	100.0
EPA 8141A	Water	Dichlorvos	Extract within 7 days, analyze within 40 days	11	11	100.0
EPA 8141A	Water	Dimethoate	Extract within 7 days, analyze within 40 days	57	57	100.0
EPA 8141A	Water	Hexazinone	Extract within 7 days, analyze within 40 days	6	6	100.0
EPA 8141A	Water	Malathion	Extract within 7 days, analyze within 40 days	70	70	100.0
EPA 8141A	Water	Parathion, Methyl	Extract within 7 days, analyze within 40 days	30	30	100.0
EPA 8141A	Water	Pendimethalin	Extract within 7 days, analyze within 40 days	40	40	100.0
EPA 8141A	Water	Prometryn	Extract within 7 days, analyze within 40 days	12	12	100.0
EPA 8141A	Water	Simazine	Extract within 7 days, analyze within 40 days	28	28	100.0
EPA 8141A	Water	Trifluralin	Extract within 7 days, analyze within 40 days	20	20	100.0
EPA 821/R-02-012	Water	*Ceriodaphnia dubia*	36 hours	81	76	93.8

Method	Matrix	Analyte	Hold time	Total Samples Analyzed	Samples Analyzed within Hold time	Acceptability Met (%)
EPA 821/R-02-012	Water	*Pimephales promelas*	36 hours	23	23	100.0
EPA 821/R-02-012M	Water	*Hyalella azteca*	36 hours	122	122	100.0
EPA 821/R-02-013	Water	*Selenastrum capricornutum*	36 hours	80	80	100.0
EPA 8260BM	Water	Chloropicrin	Extract and analyze within 14 days	14	14	100.0
EPA 8321A	Water	Carbaryl	Extract within 7 days, analyze within 40 days	22	22	100.0
EPA 8321A	Water	Diuron	Extract within 7 days, analyze within 40 days	80	79	98.8
EPA 8321A	Water	Imidacloprid	Extract within 7 days, analyze within 40 days	36	36	100.0
EPA 8321A	Water	Linuron	Extract within 7 days, analyze within 40 days	4	4	100.0
EPA 8321A	Water	Methomyl	Extract within 7 days, analyze within 40 days	38	38	100.0
NCL ME 340	Water	Clothianidin	Extract within 7 days, analyze within 40 days	6	6	100.0
NCL ME 340	Water	Cyprodinil	Extract within 7 days, analyze within 40 days	6	6	100.0
NCL ME 340	Water	Pyraclostrobin	Extract within 7 days, analyze within 40 days	17	17	100.0
SM 2130 B	Water	Turbidity	48 hours	219	219	100.0
SM 2340 C	Water	Hardness as CaCO3	180 days	239	239	100.0
SM 2540 D	Water	Total Suspended Solids	7 days	219	219	100.0
SM 4500-NH3 B/C [1]	Water	Ammonia as N	28 days	107	107	100.0
SM 4500-P E [2]	Water	OrthoPhosphate as P	48 hours	202	202	100.0
SM 5310 B	Water	Dissolved Organic Carbon	28 days	209	209	100.0
SM 5310 B	Water	Total Organic Carbon	28 days	215	215	100.0
SM 9223 B	Water	*E. coli*	24 hours	219	218	99.5
EPA 600/R-99-064	Sediment	*Hyalella azteca*	14 days	19	19	100.0
EPA 8270C SIM	Sediment	Piperonyl Butoxide	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 8270M_NCI	Sediment	Bifenthrin	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 8270M_NCI	Sediment	Chlorpyrifos	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 8270M_NCI	Sediment	Cyfluthrin, Total	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0

Method	Matrix	Analyte	Hold time	Total Samples Analyzed	Samples Analyzed within Hold time	Acceptability Met (%)
EPA 8270M_NCI	Sediment	Cyhalothrin, Total lambda-	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 8270M_NCI	Sediment	Cypermethrin, Total	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 8270M_NCI	Sediment	Deltamethrin/Tralomethrin	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 8270M_NCI	Sediment	Esfenvalerate/Fenvalerate, Total	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 8270M_NCI	Sediment	Fenpropathrin	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 8270M_NCI	Sediment	Permethrin, Total	14 days to freeze, extract within 12 months, analyze within 40 days	7	7	100.0
EPA 9060M	Sediment	Total Organic Carbon	28 days	23	23	100.0
Plumb, 1981, GS	Sediment	Clay	28 days	19	19	100.0
Plumb, 1981, GS	Sediment	Granule	28 days	19	19	100.0
Plumb, 1981, GS	Sediment	Pebble	28 days	76	76	100.0
Plumb, 1981, GS	Sediment	Sand	28 days	95	95	100.0
Plumb, 1981, GS	Sediment	Silt	28 days	19	19	100.0
			Total	**5565**	**5540**	**99.6**

[1] Some events were analyzed by SM 4500-NH3 BC v22.

[2] Some events were analyzed by SM 4500-P E v21,22.

Table 29. WSJRWC summary of toxicity laboratory control sample evaluations.

Samples collected for the 2022 Monitoring Period; sorted by method and species. Bolded rows represent analytes that did not meet 90% acceptability requirement.

Method	Matrix	Test Species	Control Test Acceptability	Total Control Tests	Control Tests within Limit	Acceptability Met (%)
EPA 821/R-02-012	Water	*Ceriodaphnia dubia*	Survival ≥ 90%	19	19	100.0
EPA 821/R-02-012	Water	*Pimephales promelas*	Survival ≥ 90%	4	4	100.0
EPA 821/R-02-012M	Water	*Hyalella azteca*	Survival ≥ 90%	25	25	100.0
EPA 821/R-02-013	Water	*Selenastrum capricornutum*	> 200,000 cells/mL, variability of controls <20%,	17	17	100.0
EPA 600/R-99-064	Sediment	*Hyalella azteca*	Survival ≥ 80%	4	4	100.0
			Total	**69**	**69**	**100.0**

DISCUSSIONS OF SURFACE WATER MONITORING RESULTS

The sections below include the 2022 Monitoring Period discussion of surface water and sediment monitoring results and exceedances of WQTLs for each site.

Table 30 includes all monitoring sites, months, and a notation if samples were collected or not due to dry, shallow, or non-contiguous conditions. A list of WQTLs used to evaluate monitoring results is included in Table 31. Table 32 through Table 48 include the exceedances that occurred in samples collected from each Discharge Site during the 2022 Monitoring Period. Table 49 through Table 51 include the exceedances that occurred in samples collected from each Source Water Site. All exceedances are discussed by sample site in the sections below. Measures taken by members and the Coalition to address exceedances are described in the Member Actions Taken to Address Water Quality Impairments section of this report.

The PUR data for the 2022 Monitoring Period are complete except pesticide applications reported by San Joaquin County. Due to the short turnaround time for this report, a cut-off date of April 26, 2023, was established to receive PUR data from San Joaquin County. San Joaquin County PUR data were available through December 31, 2022; all other county PUR data were available through the end of the Monitoring Period (Table 15). All PUR data are considered preliminary until they are released by DPR through CalPIP.

Table 30. WSJRWC dry and samples sites during the 2022 Monitoring Period.
'X' indicates the site was successfully sampled; '**D**' indicates the site was dry, too shallow, stagnant, or non-contiguous and no samples were collected. '**NS**' indicates sites that were not sampled or in the case of Mud Slough, samplers went to the wrong location.

Sampling Site	Site Type	March	April	May	June	July	August	September	October	November	December	January	February
Blewett Drain at Highway 132	Discharge Site	X	X	X	X	X	X	X	X	X	D	X	D
Del Puerto Creek at Highway 33	Discharge Site	X	X	X	X	X	X	X	D	D	D	NS	X
Del Puerto Creek near Cox Rd	Discharge Site	X	X	X	X	X	X	X	X	X	D	X	X
Hospital Creek at River Rd	Discharge Site	X	X	X	X	X	X	X	X	D	D	X	D
Ingram Creek at River Rd	Discharge Site	X	X	X	X	X	X	X	X	X	X	X	D
Los Banos Creek at China Camp Rd	Discharge Site	D	X	X	X	X	D	X	X	X	X	X	X
Los Banos Creek at Highway 140	Discharge Site	X	X	X	X	X	X	X	X	X	X	X	X
Marshall Road Drain near River Rd	Discharge Site	X	X	X	D	X	D	X	X	D	X	X	D
Mud Slough u/s San Luis Drain[1]	Discharge Site	X	X	X	X	X	X	X	X	NS	NS	NS	X
Newman Wasteway near Hills Ferry Rd	Discharge Site	X	X	X	X	X	X	X	X	X	X	NS	X
Orestimba Creek at Farm Bridge	Discharge Site	D	D	D	D	D	D	D	D	D	D	X	X
Poso Slough at Indiana Avenue	Discharge Site	X	X	X	X	X	X	D	D	D	X	X	X
Ramona Lake near Fig Avenue	Discharge Site	D	X	X	D	D	D	D	D	D	D	NS	D
Salt Slough at Lander Avenue	Discharge Site	X	X	X	X	X	X	X	X	X	X	X	X
Salt Slough at Sand Dam	Discharge Site	X	X	X	X	X	X	X	X	X	X	NS	X
San Joaquin River at Lander Avenue	Discharge Site	X	X	X	X	X	X	X	X	X	X	X	X
Westley Wasteway near Cox Rd	Discharge Site	X	X	X	X	X	X	X	X	X	NS	NS	D

Sampling Site	Site Type	March	April	May	June	July	August	September	October	November	December	January	February
San Joaquin River at Sack Dam	Source Water Site	X	X	X	X	X	X	X	X	X	X	X	X
San Joaquin River at PID Pumps	Source Water Site	X	X	X	X	X	X	X	X	X	X	X	X
Delta Mendota Canal at DPWD	Source Water Site	X	X	X	X	X	X	X	X	X	X	X	X
San Luis Canal at Highway 152	Wetland Supply Channel	X	X	X	X	X	X	X	X	X	X	X	X
Santa Fe Canal at Highway 152	Wetland Supply Channel	X	X	X	X	X	X	X	X	X	X	X	X

[1]Sante Fe Canal at Gun Club Road was sampled in error in lieu of Mud Slough u/s San Luis Drain from November to January 2022. The site was created in CEDEN to hold associated data and is not planned to be used in the future.

Table 31. Water Quality Trigger Limits.

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
pH	6.5 - 8.5 units	Numeric		Sacramento/San Joaquin Rivers Basin Plan (Page III.6.00)	1
Specific Conductivity (maximum)	900 µmhos/cm	Narrative	Agricultural Supply	Water Quality for Agriculture (Ayers & Westcot)	3
Dissolved Oxygen (minimum)	7 mg/L	Numeric	Cold Freshwater Habitat, Spawning	Sacramento/San Joaquin Rivers Basin Plan, Page III-1.6: for waters designated COLD (aquatic life).	1
	5 mg/L		Warm Freshwater Habitat	Sacramento/San Joaquin Rivers Basin Plan, Page III-1.6: for waters designated WARM (aquatic life).	
Turbidity	variable	Numeric	Municipal and Domestic Supply	Basin Plan Objective - increase varies based on natural turbidity	1
Total Dissolved Solids	450 mg/L	Narrative	Agricultural Supply	Water Quality for Agriculture (Ayers & Westcott)	3
Total Suspended Solids	NA				
Temperature	variable	Numeric		Basin Plan Objective (see objectives for COLD, WARM, and Enclosed Bays and Estuaries)	1
E coli	235 MPN/100 ml	Narrative	Water Contact Recreation	EPA ambient water quality criteria, single-sample maximum	3
Fecal coliform	200 MPN/100 ml **400 MPN/100 ml**	Numeric	Water Contact Recreation	Sacramento/San Joaquin Rivers Basin Plan (Page III.3.00) Geometric mean of not less than five samples for any 30- day period, **nor shall more than 10% of the total number of samples taken during a 30 -day period.**	1
TOC	NA				
Pesticides – Carbamates					
Aldicarb	3 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: United States Environmental Protection Agency (USEPA) Primary Maximum Contaminant Level (MCL) (MUN, human health)	1
Carbaryl	2.53 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average	3
Carbofuran	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Prohibition	2
Methiocarb	0.5 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: Handbook of Acute Toxicity of Chemicals to Fish and Aquatic Invertebrates	3
Methomyl	0.52 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average (California Department of Fish and Game) (aquatic life)	3
Oxamyl	50 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: Drinking Water Standards - Maximum Contaminant Levels (MCLs). California Dept of Health Services. Primary MCL	3
Pesticides – Organochlorines					
DDD(p,p')	0.00083 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR, Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
DDE(p,p')	0.00059 µg/L				
DDT(p,p')	0.00059 µg/L				
Dicofol	NA				

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
Dieldrin	0.00014 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.056 µg/L	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) / Continuous Concentration 4-day average (total)	1
Endrin	0.036 µg/L	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-Day Average	1
	0.76 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
Methoxychlor	0.03 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA National Ambient Water Quality Criteria - Freshwater Aquatic Life Protection - instantaneous maximum	3
	30 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Pesticides – Organophosphates					
Azinphos methyl	0.01 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA National Ambient Water Quality Criteria - instantaneous maximum	3
Chlorpyrifos	0.015 µg/L	Numeric	Freshwater Habitat	Sacramento/San Joaquin Rivers Basin Plan: page III-6.01; San Joaquin River & Delta, Sacramento & Feather Rivers; more stringent 4-day average.	1
Diazinon	0.1 µg/L	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan: San Joaquin River & Delta numeric standard. Sacramento & Feather Rivers numeric standard	1
Dichlorvos	0.085 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Drinking Water Health Advisories or Suggested No-Adverse-Response Levels for non-cancer health effects. One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water. Cal/EPA Cancer Potency Factor as a drinking water level	3
Dimethoate	1.0 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Notification Level – DHS (MUN, human health). California Notification Levels. (Department of Health Services)	3
Demeton-s	NA				
Disulfoton	0.05 µg/L	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA National Ambient Water Quality Criteria - Freshwater Aquatic Life Protection - instantaneous maximum	3
Malathion	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Prohibition	2
Methamidophos	0.35 µg/L	Narrative	Municipal and Domestic Supply	Basin Plan Toxicity Objective, Drinking Water Health Advisories or Suggested No-Adverse-Response Levels for non-cancer health effects. USEPA IRIS Reference Dose (RfD) as a drinking water level.	3
Methidathion	0.7 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Reference Dose (MUN, human health)	3
Parathion, Methyl	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Prohibition	2

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with Most Protective Limit	Reference for the Trigger Limit	Category (see footnotes)
Phorate	0.7 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Drinking Water Health Advisories or Suggested No-Adverse-Response Levels for non-cancer health effects. USEPA IRIS Reference Dose as a drinking water level.	3
Phosmet	140 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Drinking Water Health Advisories or Suggested No-Adverse-Response Levels for non-cancer health effects. USEPA IRIS Reference Dose as a drinking water level.	3
Group A Pesticides					
Aldrin	0.00013 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	3 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Instantaneous maximum	
Chlordane	0.00057 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.0043 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-day average (total)	
Heptachlor	0.00021 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.0038 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-day average (total)	
Heptachlor Epoxide	0.0001 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.0038 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-day average (total)	
Total Hexachlorocyclohexane (including lindane)	0.0039 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.95 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Maximum Concentration (1-hour Average)	
Endosulfan	110 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1
	0.056 µg/L		Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: NTR (USEPA) - Continuous Concentration 4-day average (total)	
Toxaphene	0.00073 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA), Human Health Protection, 30-Day Average - Sources of Drinking Water (water & fish consumption)	1

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
	0.0002 µg/L		Cold Freshwater Habitat, Spawning	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR (USEPA) - Continuous Concentration 4-day average (total)	
Pesticides – Herbicides					
Atrazine	1.0 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL	1
Cyanazine	1.0 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA Health Advisory (human health)	3
Diuron	2 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water. USEPA Health Advisory. Likely to be carcinogenic to humans (U.S. Environmental Protection Agency, 2005 Guidelines for Carcinogen Risk Assessment).	3
Glyphosate	700 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Linuron	1.4 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Reference Dose as a drinking water level	3
Molinate	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Discharge Prohibition	2
Paraquat	3.2 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Reference Dose as a drinking water level	3
Simazine	4.0 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Thiobencarb	ND	Numeric		Sacramento/San Joaquin Basin Plan - Basin Plan Discharge Prohibition	2
Trifluralin	5 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Cancer Risk Level. One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water	3
Metals (c)					
Arsenic	10 µg/L	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: USEPA Primary MCL (MUN, human health)	1
Boron	700 µg/L	Narrative	Agricultural Supply	Water Quality for Agriculture (Ayers & Westcot)	3
Cadmium	for aquatic life; variable (see cadmium worksheet).	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - Varies with water hardness	1
	5 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Copper	for aquatic life; variable (see copper worksheet).	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: CTR Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - Varies with water hardness/	1
	1,300 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Lead	for aquatic life; variable (see lead worksheet).	Numeric	Freshwater Habitat	CTR Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - varies with water hardness	1

Constituent	Water Quality Trigger Limit (WQTL)	Standard Type	Beneficial Use (BU) with most protective limit	Reference for the Trigger Limit	Category (see footnotes)
	15 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Molybdenum	15 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan - San Joaquin River, Mouth of the Merced River to Vernalis	1
	50 µg/L			Sacramento/San Joaquin Basin Plan - Salt Slough, Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River	
	10 µg/L	Narrative	Agricultural Supply	Water Quality for Agriculture (Ayers & Westcot)	3
	35 µg/L		Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA IRIS Reference Dose as a drinking water level.	
Nickel	For aquatic life variable (see Nickel worksheet).	Numeric	Freshwater Habitat	CTR Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - varies with water hardness	1
	100 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
Selenium	50 µg/L	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL (MUN, human health)	1
	5 µg/L (4-day average)	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: NTR Freshwater Aquatic Life Protection - Continuous Concentration - 4-Day Average	
Zinc	For aquatic life variable (see Zinc worksheet).	Numeric	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: Freshwater Aquatic Life Protection - Continuous Concentration, 4-Day Average - varies with water hardness	1
Nutrients					
Nitrate as NO3 Nitrate as N	45,000 µg/L as NO3 10,000 µg/L as N	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL	1
Nitrite as Nitrogen	1,000 µg/L as N	Numeric	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Chemical Constituents Objective: California Primary MCL	1
Ammonia	For aquatic life variable (see ammonia worksheet).	Narrative	Freshwater Habitat	Sacramento/San Joaquin Basin Plan Toxicity Objective: USEPA Freshwater Aquatic Life Criteria, Continuous Concentration	3
	1.5 mg/L (regardless of pH and Temperature values)	Narrative	Municipal and Domestic Supply	Sacramento/San Joaquin Basin Plan Toxicity Objective: Taste and Odor Threshold (Ammore and Hautala)	3
Hardness	NA				
Phosphorus, total	NA				
Orthophosphate, soluble	NA				
TKN	NA				

Category 1: Constituents that have numeric water quality objectives in the Sac-SJR Basin Plan or other WQO listed by reference such as MCLs (Page III-3.0)* , CTRs (Page III-10.1)*,
Category 2: Pesticides with discharge prohibitions. Prohibitions apply to any discharges not subject to board-approved management practices (Page IV-25.0)*.

Category 3: Constituent does not have numeric WQO and does not have a primary MCL. WQTL exceedance is based on implementation of narrative objective. All detections should be tracked. None are default exceedances.

MUN-Municipal and Domestic Supply

NA-Not Available. Until completion of evaluation studies and MRP Plan submittals with site specific information on beneficial uses.

ND-Not Detected

(*)-Water Quality Control Plan for the Sacramento and San Joaquin River Basins. Revised on October 2007.

Narrative WQTLs are based on Water Quality Goals Database. Updated by Jon Marshack on July 16, 2008.

DISCHARGE SITES

There are 17 Discharge Sites within the Coalition boundary (Table 6). During the 2022 Monitoring Period, the Coalition monitored all 17 Discharge Sites according to the strategy and schedule outlined in the 2022 MPU.

Blewett Drain at Highway 132

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Blewett Drain at Highway 132. Sample collection did not occur during the December 2022 and February 2023 months due to stagnant water and dry or non-contiguous waterbody conditions (Table 30). Table 32 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for copper, chlorpyrifos, pyrethroids, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

Exceedances of WQTLs for field parameters such as DO, SC, and pH are difficult to source. These parameters are non-conserved, meaning they may fluctuate as water moves downstream. The concentrations of these parameters are the result of processes occurring in the water column and in the sediment, which can vary seasonally and/or diurnally. Due to the difficulty of sourcing, the Coalition does not include field parameters in its management plan strategy, Focused Outreach efforts, or monitoring for management plan constituents.

DO

Processes affecting DO in waterways and drains include stream flow, fluctuations in temperature, loss of vegetation around streams, excessive nutrients triggering algal growth, biological and chemical oxygen demand (BOD and COD, respectively), TOC/TSS, and associated field parameters such as SC.

Monitoring during the 2022 Monitoring Period resulted in seven exceedances of the WQTL for DO during irrigation monitoring (ranging from 1.11 mg/L to 3.84 mg/L; Table 32

pH

Low pH can be caused by anthropogenic influences such as atmospheric deposition of air pollutants and drainage from mining activities, neither of which are agricultural sources. The primary agricultural contributors to elevated pH levels are limited to stormwater and irrigation runoffs; runoff of lime-rich soil amendments and nitrogen-rich organic matter can cause fluctuations in pH levels. Furthermore, photosynthesis and decomposition can cause daily and seasonal variation in pH and the bioavailability of some constituents (e.g., copper) are affected by changes in pH.

During the 2022 Monitoring Period, there were seven exceedances of the WQTL for pH (ranging from 8.57 to 9.03; Table 32).

E. coli

Elevated levels of *E. coli* in the waterways could be due to 1) storm runoff carrying bacteria from dairy facilities in the watershed, 2) manure from dairies sold to adjacent farms that, if improperly composted and stored, can contribute to elevated levels of bacteria in the waterway, and 3) naturally occurring *E. coli* bacteria in the waterways.

During the 2022 Monitoring Period, there was one exceedance of the WQTL for *E. coli* (686.7 MPN/100 mL; Table 32).

Pyrethroids and Water Column Toxicity to H. azteca

Pyrethroids are a group of synthetic organic insecticides that are applied to a variety of crops and around urban structures in California throughout the year for pest control. Pyrethroids can bind to organic matter and sediment; however, each pyrethroid displays different levels of persistence in sediment. Pyrethroids can also persist in the water column although they are moved downstream with the current. Common pyrethroids used in agriculture are bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin, and permethrin. The Coalition analyzes for all six of these pyrethroids when samples are collected for pyrethroid monitoring. Sampling for water column toxicity to *H. azteca* is required in the Pyrethroid BPA to coincide with water column pyrethroid analysis. A TIE is not required for water column toxicity to *H. azteca*.

Samples collected on May 10, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with a detection of bifenthrin (0.002 ug/L; CGU = 4; Table 32). The only pyrethroid detected in the sample was bifenthrin with a detection of 0.002 µg/L. The PUR data associated with the exceedance indicate three applications of bifenthrin totaling 38 lbs of AI applied across 265 acres of almonds from April 22, 2022 through May 10, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca*.

Samples collected on June 14, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.002 ug/L) and lambda-cyhalothrin (0.002 ug/L; CGU = 5; Table 32). The PUR data associated with the exceedance indicate 10 applications of bifenthrin and lambda-cyhalothrin containing 51 lbs of AI applied across 596 acres of cherry and nut trees from April 2, 2022 through June 14, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca*.

Samples collected on July 12, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.0009 ug/L) and lambda-cyhalothrin (0.01 ug/L; CGU = 10; Table 32). The PUR data associated with the exceedance indicate 19 applications of bifenthrin and lambda-cyhalothrin containing 85 lbs of AI applied across 1,311 acres of cherry, tomatoes, and nut trees from April 2, 2022 through July 12, 2022 (Attachment B). Water column toxicity to *H. azteca* occurred in samples collected during the same sampling event with 30% survival compared to the control. The PUR data associated with the exceedance and toxicity indicate 84 applications containing 983 lbs of AI were applied across 5,088 acres of nut trees from April 22, 2022 through July 12, 2022 (Attachment B).

Samples collected on August 9, 2022 did not result in an exceedance of the pyrethroid CGU, but did result in detections of bifenthrin (0.0005 ug/L) and lambda-cyhalothrin (0.0006 ug/L). However, water column toxicity to *H. azteca* occurred with 62% survival compared to the control. The PUR data associated with the exceedance and toxicity indicate 45 applications containing 530 lbs of AI were applied across 3,667 acres of nut trees from May 3, 2022 through August 9, 2022 (Attachment B).

Samples collected on January 10, 2023 did not result in an exceedance of the pyrethroid CGU, but did result in a detection of esfenvalerate (0.0054 ug/L). However, water column toxicity to *H. azteca* occurred with 5% survival compared to control. The PUR data did not indicate any associated applications with this water column toxicity. The most recent pesticide application prior to sample collection occurred on September 8, 2022.

The Coalition initiated a management plan for pyrethroids during the 2021 Monitoring Period in conjunction with Focused Outreach. Monitoring for pyrethroids will continue in the 2023 Monitoring Period as part of the Assessment Monitoring strategy.

Table 32. Exceedances of WQTLs at Blewett Drain at Highway 132 during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	pH, (< 6.5 or > 8.5)	*E. coli*, (> 235 MPN/100 mL)	Pyrethroid CGU, (> 1)	H. azteca Water Toxicity, % Control
Irrigation	3/8/2022	3.6		8.98			
Irrigation	4/12/2022	3.6		9.03			
Irrigation	5/10/2022	7.2				**4**	
Irrigation	6/14/2022	3.6		8.83		**5**	
Irrigation	7/12/2022	9.0	3.84	8.87		**10**	30
Irrigation	8/9/2022	7.2	3.13	8.61			62
Irrigation	9/12/2022	0.2	1.68	8.98			
Irrigation	9/13/2022	2.7	2.99				
Non-Irrigation	10/11/2022	2.7	2.83	8.69			
Rain	11/9/2022	0.5	3.21				
Non-Irrigation	1/10/2023	7.2	1.11	8.57	686.7		5
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**3**	**NA**
Total Exceedances		NA	7	7	1	3	3

Del Puerto Creek at Highway 33

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Del Puerto Creek at Highway 33. Sample collection did not occur from October 2022 through January 2023 due to stagnant water and dry or non-contiguous waterbody conditions (Table 30). Table 33 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for boron, DDE, parathion, pyrethroids, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

Monitoring during the 2022 Monitoring Period resulted in six exceedances of the WQTL for DO ranging from 1.19 to 3.48 mg/L (Table 33). Ten exceedances of the WQTL for pH occurred ranging from 8.93 to 10.06.

SC

Elevated levels of SC are frequently observed within Coalition boundaries due to the presence of shallow, salty groundwater within the monitoring region. In the Coalition area, low subsurface drainage of the soil leads to elevated water tables, which in turn increases interactions between groundwater and surface water. These interactions introduce dissolved ions into surface water systems, causing an increase in SC. The accumulation of salt in the root zone can hinder crop growth and reduce yield potential. By lowering the water table below the root zone through the installation of tile drains, excess water and salts can be effectively intercepted and removed, mitigating the adverse effects on crop productivity.

Monitoring during the 2022 Monitoring Period resulted in five exceedances of the WQTL for SC occurred ranging from 972 to 1,171 µS/cm (Table 33).

E. coli

During the 2022 Monitoring Period, there were four exceedances of the WQTL for E. *coli* ranging from 248.1 to >2419.6 MPN/100 mL (Table 33).

Boron

Natural weathering of geologic materials results in the release of metals and metalloid elements, including selenium, arsenic, and boron. Boron is present in elevated concentrations in the coastal mountain ranges and runoff transports it from these mountains to the Valley floor. Various forms of boron can also be present in pesticides and fertilizers, making it challenging to determine the exact source of boron in relation to water quality results.

Samples collected for the March, April, and May events contained elevated levels of boron that exceeded the WQTL (920, 830, and 870 µg/L, respectively; Table 33).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on May 10, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.001 ug/L) and lambda-cyhalothrin (0.005; CGU = 5; Table 33). The PUR data associated with the exceedance indicate 32 applications of bifenthrin and lambda-cyhalothrin containing 88 lbs of AI applied across 1,702 acres of primarily nut trees from December 15, 2021 through May 10, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca*.

Sediment toxicity to H. azteca

Sediment samples collected March 7, 2022 were toxic to *H. azteca* with 76% survival compared to the control (Table 33). The PUR data associated with the toxicity indicate 52 applications of pesticides containing 591 lbs of AI across 3,060 acres of primarily nut trees from November 12, 2021 through March 7, 2022 (Attachment B).

The site is in a management plan for sediment toxicity to *H. azteca* and will be monitored as part of the Assessment Monitoring strategy during the 2023 Monitoring Period.

Table 33. Exceedances of WQTLs at Del Puerto Creek at Highway 33 during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

SEASON	SAMPLE DATE	DISCHARGE, CFS	DO, (< 5 MG/L)	PH, (< 6.5 OR > 8.5)	SC, (> 900 µS/CM)	*E. COLI*, (> 235 MPN/100 ML)	BORON, (> 800 UG/L)	PYRETHROID CGU, (> 1)	*H. AZTECA* SEDIMENT TOXICITY, % CONTROL
Irrigation	3/7/2022	9		9.74	973				**76**
Irrigation	3/8/2022	9		10.06			**920**		
Irrigation	4/12/2022	18		9.29		248.1	**830**		
Irrigation	5/10/2022	9		9.35	1127		**870**	5	
Irrigation	6/14/2022	27.0	3.48	9.39		248.1			
Irrigation	7/12/2022	4.5	2.35	8.93		> 2419.6			
Irrigation	8/9/2022	9.0	1.19	9.41	1171	613.1			
Non-Irrigation	9/12/2022	2.3	2.88	9.24	1069				
Non-Irrigation	9/13/2022	18.0	3.01	9.20	972				
Non-Irrigation	2/14/2023	27.0	2.26	9.58					
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**3**	**NA**	**1**
Total Exceedances		NA	6	10	5	4	3	1	1

Del Puerto Creek near Cox Road

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Del Puerto Creek near Cox Road. Sample collection did not occur in December 2021 due to dry or non-contiguous waterbody conditions (Table 30). Table 34 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for boron, DDE, pyrethroids, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, there were nine exceedances of the DO WQTL, ranging from 0.99 to 3.65 mg/L. Thirteen exceedances of the WQTL for pH occurred, ranging from 8.93 to 9.56. Eight exceedances of the WQTL for SC occurred, ranging from 929 to 1,304 µS/cm. (Table 34).

E. coli

During the 2022 Monitoring Period, there were six exceedances of the WQTL for *E. coli*, ranging from 376.2 to >2,419.6 MPN/100 mL (Table 34).

Boron

Samples collected on March 8, 2022 resulted in an exceedance of the WQTL for boron with a value of 880 µg/L (Table 34).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on May 10, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.001 ug/L) and lambda-cyhalothrin (0.001; CGU = 2; Table 34). The PUR data associated with the exceedance indicate 32 applications of bifenthrin and lambda-cyhalothrin containing 88 lbs of AI applied across 1,702 acres of primarily nut trees from December 15, 2021 through May 10, 2022 (Attachment B). Water column samples collected during the same sampling event did not result in toxicity to *H. azteca.*

Samples collected on September 13, 2022 did not result in an exceedance of the pyrethroid chronic additive CGU; however, water column toxicity to *H. azteca* occurred with 0% survival compared to the control. The PUR data indicate 353 applications containing 3,495 lbs of AI applied across 20,955 acres of primarily nut trees from April 19, 2022 through September 13, 2022 (Attachment B).

This site is in a management plan for pyrethroids. Water column toxicity to *H. azteca* will be addressed as part of the management plan for pyrethroids. Pyrethroids will be monitored as part of the Assessment Monitoring strategy during the 2023 Monitoring Period.

Table 34. Exceedances of WQTLs at Del Puerto Creek near Cox Road during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, CFS	DO, (< 5 MG/L)	pH, (< 6.5 Or > 8.5)	SC, (> 900 µS/CM)	*E. coli*, (> 235 MPN/100 ML)	Boron, (> 800 UG/L)	Pyrethroid CGU, (> 1)	H. azteca Water Toxicity, % Control
Irrigation	3/7/2022	9		9.42	929				
Irrigation	3/8/2022	18		9.35			**880**		
Irrigation	4/12/2022	9		9.24					
Irrigation	5/10/2022	9		9.43	1143			**2**	
Irrigation	6/14/2022	27	3.26	9.29	956				
Irrigation	7/12/2022	13.5	2.31	9.18	1241	376.2			
Irrigation	8/9/2022	27.00	0.99	9.23	964	387.3			
Irrigation	9/12/2022	9.00	2.64	9.36	1296				
Irrigation	9/13/2022	27.00	3.63	9.48	1251	488.4			0
Non- Irrigation	10/11/2022	9.00	3.31	9.21	1304	1230.3			
Rain	11/9/2022	2.30	3.65	8.93		> 2419.6			
Non- Irrigation	1/10/2023	21.60	1.44	9.06		387.3			
Non- Irrigation	2/14/2023	18.00	2.35	9.56					
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**1**	**1**	**NA**
Total Exceedances		NA	9	13	8	6	1	1	1

Hospital Creek at River Road

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Hospital Creek at River Road. Sample collection did not occur during the November 2022, December 2022, and February 2023 months due to stagnant water and dry or non-contiguous waterbody conditions (Table 30). Table 35 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for arsenic, boron, lead, nickel, DDE, DDT, water column toxicity to *C. dubia* and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

There were seven exceedances of the WQTL for DO ranging from 1.47 to 3.57 mg/L during the 2022 Monitoring Period. Eleven exceedances of the WQTL for pH occurred, ranging from 8.55 to 9.91. Four exceedances of the WQTL for SC occurred, ranging from 927 to 1,065 µS/cm (Table 35).

E. coli

During the 2022 Monitoring Period, there were five exceedances of the WQTL for *E. coli* in samples collected from Hospital Creek at River Road, ranging from 248.9 to >2419.6 MPN/100 mL (Table 35).

Boron

Three samples collected during the 2022 Monitoring Period resulted in an exceedance of the WQTL for boron, ranging from 880 to 1,280 µg/L (Table 35).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on May 10, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with a detection of bifenthrin (0.002 µg/L; CGU = 3; Table 35). The PUR data associated with the exceedance indicate seven applications of bifenthrin containing 68 lbs of AI applied across 430 acres of almonds from March 30, 2022 through May 10, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca*.

Samples collected on July 12, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.0008 µg/L) and lambda-cyhalothrin (0.0009 µg/L; CGU = 3; Table 35). The PUR data associated with the exceedance indicate 67 applications of bifenthrin and lambda-cyhalothrin containing 290 lbs of AI applied across 4,837 acres of primarily nut trees from March 29, 2022 through July 12, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca*.

Samples collected on August 9, 2022 did not result in an exceedance of the pyrethroid CGU, nor were any pyrethroids detected. However, water column toxicity to *H. azteca* occurred with 0% survival compared to the control. The PUR data indicate 147 applications containing 1,260 lbs of

AI, primarily paraquat dichloride, were applied across 12,484 acres of walnuts and cherries from May 19, 2022 through August 9, 2022.

Samples collected on September 13, 2022 did not result in an exceedance of the pyrethroid CGU, nor were any pyrethroids detected. However, water column toxicity to *H. azteca* occurred with 55% survival compared to the control. The PUR data indicate 109 applications containing 962 lbs of AI of primarily clofentezine were applied across 9,157 acres of primarily nut trees from June 22, 2022 through September 13, 2022 (Attachment B).

Samples collected on January 10, 2022 did not result in an exceedance of the pyrethroid CGU, nor were any pyrethroids detected. However, water column toxicity to *H. azteca* occurred with 25% survival compared to the control. The PUR data indicate nine applications containing 521 lbs of AI of primarily copper oxychloride were applied across 1,142 acres of primarily nut trees from October 31, 2022 through January 10, 2023 (Attachment B).

Hospital Creek at River Road is in a management plan for pyrethroids. Water column toxicity to *H. azteca* will be assessed as part of the pyrethroid management plan. Monitoring for pyrethroids will continue during the 2023 Monitoring Period as part of the Assessment Monitoring strategy.

Sediment toxicity to H. azteca

Sediment samples collected on March 7, 2022 were toxic to *H. azteca* (36% survival compared to the control; Table 35). The PUR data associated with the toxicity indicate 36 applications of 756 lbs AI across 3,448 acres of primarily nut trees and stone fruit from December 19, 2021 through March 7, 2022 (Attachment B).

Table 35. Exceedances of WQTLs at Hospital Creek at River Road during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, CFS	DO, (< 5 MG/L)	pH, (< 6.5 Or > 8.5)	SC, (> 900 µS/CM)	*E. coli*, (> 235 MPN/100 ML)	Boron, (> 800 UG/L)	Pyrethroid CGU, (> 1)	Water *H. azteca*, (% Control)	Sediment *H. azteca*, (% Control)
Irrigation	3/7/2022	3.6		8.81	927					**36**
Irrigation	3/8/2022	3.6		9.43			**920**			
Irrigation	4/12/2022	1.8		9.91	932		**900**			
Irrigation	5/10/2022	3.6		9.41	959			**3**		
Irrigation	6/14/2022	4.5	4.59	9.01		410.6				
Irrigation	7/12/2022	1.8	3.35	9.38				**2**		
Irrigation	8/9/2022	45.0	2.37	8.70		> 2419.6			0	
Non-Irrigation	9/12/2022	1.8	1.47	9.59						
Non-Irrigation	9/13/2022	21.6	3.52	8.84	1065	> 2419.6	**1280**		55	
Non-Irrigation	10/11/2022	2.3	2.99	8.99		248.9				
Non-Irrigation	1/10/2023	32.4	3.57	8.55		307.6			25	
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**3**	**2**	**NA**	**1**
Total Exceedances		NA	7	11	4	5	3	2	3	1

Ingram Creek at River Road

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Ingram Creek at River Road. Sample collection did not occur during February 2023 due to stagnant water conditions (Table 30). Table 36 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for arsenic, boron, lead, chlorpyrifos, DDE, pyrethroids, water column toxicity to *C. dubia*, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

Monitoring during the 2022 Monitoring Period resulted in nine exceedances of the WQTL for DO (ranging from 1.52 to 4.57), 13 exceedances of the WQTL for pH (ranging from 8.93 to 9.66), and seven exceedances of the WQTL for SC (ranging from 907 to 1,160 µS/cm; Table 36).

E. coli

During the 2021 Monitoring Period, there were four exceedances of the WQTL for *E. coli* ranging from 410.6 to >2419.6 MPN/100 mL (Table 36).

DDT, DDE, and DDD

The pesticide DDT, a legacy insecticide, has been persistent in the world's environment since its ban in 1973. Natural weathering in aerobic and anaerobic soils breaks DDT down into DDE and DDD. The byproducts, DDE and DDD, adsorb to soil particles and may enter waterways through runoff from contaminated soil and persist in aquatic sediments.

During the 2022 Monitoring Period a single exceedance of the WQTL for DDE occurred (0.025 µg/L; Table 36).

One exceedance of the WQTL for DDT occurred during the 2022 Monitoring Period (0.0039 µg/L, Table 36).

Methomyl

Methomyl is a carbamate insecticide that is classified as a Restricted Use Pesticide because of its acute toxicity to humans; it is an acetylcholinesterase inhibitor and is used to control foliage and soil-borne insect pests. Methomyl is highly soluble and exhibits a low affinity for binding to soil and sediment particles. However, methomyl can still adsorb to sediment to some degree, particularly if the sediment has a high organic matter content.

One exceedance of the WQTL for methomyl occurred during the 2022 Monitoring Period (0.53 µg/L, Table 36).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on April 12, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with a detection of bifenthrin (0.002 µg/L; CGU = 3; Table 36). The PUR data did not indicate any associated bifenthrin applications with the exceedance. The most recent prior application occurred on October 2, 2021. Water column samples collected during the same sampling event did not result in toxicity to *H. azteca.*

Samples collected on May 10, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.003 µg/L) and lambda-cyhalothrin (0.002 µg/L; CGU = 6; Table 36). The PUR data associated with the exceedance indicate 71 applications of bifenthrin and lambda-cyhalothrin containing 71 lbs of AI applied across 1,683 acres of primarily nut trees from January 27, 2022 through May 10, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca.*

Samples collected on June 14, 2022 contained elevated levels of pyrethroids that resulted in an exceedance of the pyrethroid CGU ; CGU = 2; Table 36). The PUR data associated with this exceedance indicate two applications of bifenthrin containing 6 lbs of AI applied across 43 acres of nut trees and nursery stock from May 2, 2022 through June 14, 2022. Water column samples collected during the same sampling event were not toxic to *H. azteca.*

Samples collected on July 12, 2022 contained elevated levels of pyrethroids that resulted in an exceedance of the pyrethroid CGU with detections of bifenthrin (0.002 µg/L) and lambda-cyhalothrin (0.0005 µg/L; CGU = 4; Table 36). The PUR data associated with this exceedance indicate 96 applications of bifenthrin and lambda-cyhalothrin containing 314 lbs of AI applied across 5,245 acres of primarily nut trees and stone fruit from January 27, 2022 through July 12, 2022. Water column samples collected during the same sampling event were not toxic to *H. azteca*.

Samples collected on August 9, 2022 contained elevated levels of pyrethroids that resulted in an exceedance of the pyrethroid CGU with detections of bifenthrin (0.03 µg/L), lambda-cyhalothrin (0.005 µg/L), and fenvalerate (0.003 µg/L; CGU = 40; Table 36). The PUR data associated with this exceedance indicated 125 applications of bifenthrin, cyhalothrin, and fenvalerate containing 405 lbs of AI applied across 7,081 acres of primarily nut trees and tomatoes from March 25, 2022 through August 9, 2022 (Attachment B). Water column *H. azteca* samples collected during the same sampling event resulted in 0% survival compared to the control. In addition to pyrethroids, 196 applications containing 2,270 lbs of other AI were also associated with this water column *H. azteca* exceedance.

Samples collected on September 13, 2022 did not result in an exceedance of the pyrethroid CGU, nor were any pyrethroids detected. However, water column toxicity to *H. azteca* occurred with 0% survival compared to the control. The PUR data indicate 308 applications containing 3,611 lbs of AI of primarily chlorothalonil were applied across 20,131 acres of nut trees, corn, and legumes from June 21, 2022 through September 13, 2022 (Attachment B).

Ingram Creek at River Road is in a management plan for pyrethroids. Water column toxicity to *H. azteca* will be addressed as part of the pyrethroid management plan. Monitoring for pyrethroids will continue in the 2023 Monitoring Period as part of the Assessment Monitoring strategy.

Sediment toxicity to H. azteca

Sediment samples collected on March 7, 2022 were toxic to *H. azteca* (0% survival compared to the control; Table 36). The PUR data associated with the toxicity indicate 55 applications of 645 lbs of pesticides across 3,841 acres of nut trees and tomatoes from September 20, 2021 through March 7, 2022 (Attachment B).

Sediment samples collected on September 12, 2022 were toxic to *H. azteca* (0% survival compared to the control; Table 36). The PUR data associated with the toxicity indicate 322 applications of 4,233 lbs of pesticides, primarily chlorothalonil, across 24,119 acres of primarily nut trees, corn, and tomatoes from April 1, 2022 through September 12, 2022 (Attachment B).

Table 36. Exceedances of WQTLs at Ingram Creek at River Road during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L	pH, (< 6.5 or > 8.5)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	DDE(p,p'), (>0.00059 ug/L)	DDT(p,p'), (>0.00059 ug/L)	Methomyl, (> 0.52 ug/L)	Pyrethroid CGU, (> 1)	Water *H. azteca*, (% Control)	Sediment *H. azteca*, (% Control)
Irrigation	3/7/2022	9		9.61	1036							**0**
Irrigation	3/8/2022	18		9.18								
Irrigation	4/12/2022	18		9.22						**2**		
Irrigation	5/10/2022	18		9.31	919					**6**		
Irrigation	6/14/2022	18	4.38	9.66	910					**2**		
Irrigation	7/12/2022	18	2.49	9.58	1130					**4**		
Irrigation	8/9/2022	9.0	1.79	9.17	1160		**0.025**	0.039	0.53	**40**	0	

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L	pH, (< 6.5 or > 8.5)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	DDE(p,p'), (>0.00059 ug/L)	DDT(p,p'), (>0.00059 ug/L)	Methomyl, (> 0.52 ug/L)	Pyrethroid CGU, (> 1)	Water *H. azteca*, (% Control)	Sediment *H. azteca*, (% Control)
Non-Irrigation	9/12/2022	9.00	1.66	9.21	1056							0
Non-Irrigation	9/13/2022	13.5	4.08	9.24	904	920.8					0	
Non-Irrigation	10/11/2022	13.5	3.95	9.11		> 2419.6						
Rain	11/9/2022	4.50	4.57	8.93		410.6						
Rain	12/5/2022	13.50	3.7	8.99								
Non-Irrigation	1/10/2023	54.00	1.52	8.94		920.8						
Monitoring for Management Plan Exceedances		NA	NA	NA	NA	NA	1	NA	NA	5	NA	2
Total Exceedances		NA	9	13	7	4	1	1	1	5	2	2

Los Banos Creek at China Camp Road

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Los Banos Creek at China Camp Road. Sample collection did not occur during the March 2022 and August 2022 months due to dry or non-contiguous waterbody conditions (Table 30). Table 37 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for ammonia as N, arsenic, boron, and molybdenum (Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, six exceedances of the WQTL for DO occurred, ranging from 2.4 to 4.9 mg/L. Three exceedances of the WQTL for pH occurred, ranging from 6.4 to 8.95 (Table 37). Six exceedances of the WQTL for SC occurred ranging from 1,522 to 2,358 (Table 37).

E. coli

During the 2022 Monitoring Period, there were nine exceedances of the WQTL for *E. coli* ranging from 365.4 to >2419.6 MPN/100 mL (Table 37).

Arsenic

Products containing arsenic for agricultural purposes have been phased out since the 1980s. However, arsenic acid, arsenic acid anhydride, arsenic trioxide, and chromate copper arsenate are currently registered for nonagricultural uses including wood protectants, household ant killer, weed killer around ditches, nonagricultural areas, buildings, driveways, sidewalks, and fencerows. Moreover, the geology of the Coalition region is also known to have naturally occurring sources of arsenic and it is likely that exceedances of the arsenic WQTL are due to naturally occurring instances. There are no registered products for agricultural use containing arsenic and therefore there are no PUR data associated with arsenic exceedances.

Monitoring for arsenic resulted in five exceedances of the WQTL (> 10 μg/L), ranging from 11 to 21 μg/L (Table 37).

Boron

Monitoring for boron resulted in seven exceedances of the WQTL (> 800 μg/L), ranging from 1,500 to 2,800 μg/L (Table 37).

Molybdenum

Although it is possible for molybdenum to be applied by agriculture, there are no registered products containing this constituent currently in use in the Coalition area. A small amount of molybdenum may be found in fertilizer blends. The Coalition conducted a preliminary analysis to evaluate water quality parameters most likely to influence molybdenum (submitted March 23, 2016). The study concluded molybdenum found in Coalition surface water is naturally occurring (Westcot and Belden (1989) and Westcot et al. (1988)). Molybdenum is found in water entering the Coalition's agricultural regions from the Coastal Range, and from shallow groundwater that is removed from the shallow subsurface by the major drains on the west side of the Coalition region.

Monitoring for molybdenum resulted in seven exceedances of the WQTL (> 10 μg/L), ranging from 11 to 17 μg/L (Table 37).

Table 37. Exceedances of WQTLs at Los Banos Creek at China Camp Road during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, CFS	DO, (< 5 mg/L)	pH, (< 6.5 or > 8.5)	SC, (> 900 μS/cm)	*E. coli*, (> 235 MPN/100 mL)	Arsenic, (> 10 μg/L)	Boron, (> 800 μg/L)	Molybdenum, (> 10 μg/L)
Irrigation	4/12/2022	NR	4.4		1522	866.4	**13**	**2800**	**16**
Irrigation	5/10/2022	0.55	4.9		2201	613.1		**2500**	**14**
Irrigation	6/14/2022	0.55	2.9		2133	1413.6	**14**	**2300**	**12**
Irrigation	7/12/2022	0.55	2.4		1892	> 2419.6	**16**	**1500**	**13**
Non-Irrigation	9/13/2022	0.55	4.6		2358	> 2419.6	**21**	**2320**	**11**
Non-Irrigation	10/11/2022	0.55				1299.7			
Rain	11/9/2022	0.55	4.4	6.4	1974	> 2419.6		**1900**	**17**
Rain	12/5/2022	NR		8.95					
Non-Irrigation	1/10/2023	35.00		8.8		866.4			
Non-Irrigation	2/14/2023	0.55				365.4	**11**	**1770**	**16**
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**5**	**7**	**7**
Total Exceedances		NA	6	3	6	9	5	7	7

Los Banos Creek @ Hwy 140

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Los Banos Creek at Hwy 140. Table 38 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for arsenic, boron, molybdenum, and sediment toxicity to *H. Azteca* (Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, four exceedances of the WQTL for DO occurred, ranging from 2.5 to 3.7 mg/L. Seven exceedances of the WQTL for SC occurred ranging from 1,360 to 8,840 µS/cm (Table 38).

E. coli

During the 2022 Monitoring Period, there were seven exceedances of the WQTL for *E. coli* ranging from 275.5 to >2419.6 MPN/100 mL (Table 38).

Arsenic

Monitoring for arsenic resulted in four exceedances of the WQTL (> 10 µg/L), ranging from 11 to 26 µg/L (Table 38).

Boron

Monitoring for boron resulted in seven exceedances of the WQTL (> 800 µg/L), ranging from 860 to 6,500 µg/L (Table 38).

Molybdenum

Five exceedances of the WQTL for molybdenum (> 10 µg/L) occurred with values ranging from 11 to 39 µg/L (Table 38).

Selenium

Selenium is a naturally occurring element that is released into waterbodies through geologic weathering processes. Selenium salts are naturally elevated in the southwest portion of the San Joaquin Valley and are transported to surface waters during storm water runoff, through shallow groundwater accretion or through subsurface drain water (tile water) discharges. Studies by USGS and the Regional Water Board have documented regional geology as well as the background concentrations of selenium in both surface water and groundwater. These background concentrations are above the WQTLs for selenium due to normal weathering of geologic material originating in the hills to the west of the Coalition region. These background concentrations are above the WQTLs for several of these constituents and consequently, it is not possible to manage these constituents by the implementation of management practices on farming operations.

Two exceedances of the WQTL for selenium (> 5 µg/L) occurred with values of 5.1 and 5.7 µg/L (Table 38).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on August 9, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with a detection of bifenthrin (0.005 µg/L; CGU = 2; Table 38). The PUR data associated with the exceedance indicate 117 applications of bifenthrin containing 1,465 lbs of AI applied across 1,683 acres of nut trees and tomatoes from March 21, 2022 through August 9, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca*.

Samples collected on September 13, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.014 µg/L) and permethrin (0.049 µg/L; CGU = 3; Table 38). The PUR data associated with the exceedance indicates 152 applications of bifenthrin and permethrin containing 2,054 lbs of AI applied across 11,064 acres of nut trees and tomatoes from April 19, 2022 through September 13, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca*.

The Coalition initiated a management plan for pyrethroids during the 2022 Monitoring Period at Los Banos Creek @ Hwy 140. Monitoring for pyrethroids will continue in the 2023 Monitoring Period as part of the Assessment Monitoring strategy.

Water Column Toxicity to C. dubia

Samples collected on June 14, 2022 were toxic to *C. dubia* with 0% survival compared to the control (Table 38). A TIE was conducted and indicated that the observed toxicity in the sample may have been due at least in part to conductivity above the test species tolerance. The PUR data associated with the toxicity indicate 180 applications containing 64,492 lbs AI of pesticides across 13,983 acres of primarily nut trees and tomatoes from April 1, 2022 through June 14, 2022 (Attachment B).

Monitoring for toxicity for *C. dubia* will continue into the 2023 Monitoring Period as part of the Assessment Monitoring strategy.

Table 38. Exceedances of WQTLs at Los Banos Creek @ Hwy 140 during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	Arsenic, (> 10 µg/L)	Boron, (> 800 µg/L)	Molybdenum, (> 10 µg/L)	Selenium, (> 5 ug/L)	Pyrethroid Chronic Goal Unit, (> 1)	*Ceriodaphnia dubia* Toxicity, % Control
Irrigation	3/8/2022	NR		1659	770.1	**11**	**1500**				
Irrigation	4/12/2022	NR		1966			**1600**	**11**			
Irrigation	5/10/2022	27	3.7	2849	866.4	**26**	**2100**	**17**			
Irrigation	6/14/2022	0.55	2.5	8840	> 2419.6		**6500**	**39**	5.7		0
Irrigation	7/12/2022	3		5792	> 2419.6		**4300**	**22**			
Irrigation	8/9/2022					**20**	**860**			2	
Non-Irrigation	9/13/2022	0	3.1	8558	> 2419.6		**6400**	**35**	5.1	3	
Non-Irrigation	10/11/2022	0	2.7								
Rain	11/9/2022	0		1360	387.3	**11**					
Non-Irrigation	1/10/2023	125.00			1203.3						
Non-Irrigation	2/14/2023	3.00					**1840**				
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**4**	**8**	**5**	**NA**	**NA**	**NA**
Total Exceedances		NA	4	7	7	4	8	5	2	2	1

Marshall Road Drain near River Road

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Marshall Road Drain near River Road. Sample collection did not occur during the June 2022, August 2022, November 2022, and February 2023 months due to stagnant water conditions (Table 30). Table 39 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for arsenic, ammonia as N, arsenic, boron, lead, chlorpyrifos, DDE, dimethoate, diuron, pyrethroids, water column toxicity to *S. capricornutum*, water column toxicity to *C. dubia*, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, there were five exceedances of the WQTL for DO ranging from 1.46 to 3.14 mg/L. Eight exceedances of the WQTL for pH occurred, ranging from 8.89 to 9.64. Five exceedances of the WQTL for SC occurred, ranging from 919 to 1,534 μS/cm (Table 39).

E. coli

During the 2022 Monitoring Period, there were two exceedances of the WQTL for *E. coli*, both with a value > 2419.6 MPN/100 mL (Table 39).

Ammonia as N

Ammonium can enter a waterbody from three sources: 1) direct discharge of agricultural fertilizers (anhydrous ammonia), 2) direct discharge of animal waste, and 3) discharge from wastewater treatment plants. In soils, ammonium from fertilizers is typically converted to nitrite and then to nitrate over a very short period. Also, ammonium is a cation which binds to the soil tightly until it is converted. Even if it is not converted immediately, it remains in the soil column bound to negatively charged ions in the soil matrix. Therefore, ammonium from fertilizers would require a direct discharge to surface waters to detect it in the receiving waters. The method of anhydrous ammonium application to fields is injection into soil which argues against direct discharge to a receiving waterbody. Animal waste from confined animal facilities has a high load of dissolved ammonia and organic material that can easily be transported to surface waters.

Monitoring for ammonia as N resulted in four exceedances of the variable WQTL with concentrations ranging from 0.21 to 0.34 mg/L (Table 39).

The Coalition will continue monitoring ammonia as part of the Assessment Monitoring strategy during the 2023 Monitoring Period.

Boron

Monitoring for boron resulted in a single exceedance of the WQTL (> 800 μg/L), with a concentration of 810 μg/L (Table 39).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on May 10, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.002 ug/L) and lambda-cyhalothrin (0.008 ug/L; CGU = 6; Table 39). The PUR data associated with the exceedance indicate 150 applications of bifenthrin and cyhalothrin containing 107 lbs of AI applied across 2,058 acres of almonds and lettuc from November 28, 2021 through May 10, 2022 (Attachment B). Water column *H. azteca* samples collected during the same sampling event resulted in 17% survival compared to the control. In addition to pyrethroids, 217 applications containing 2,024 lbs of other AI of primarily chlorothalonil, were also associated with this water column *H. azteca* exceedance. These applications were applied across 8,326 acres of nut trees and cherries from February 21, 2022 through May 10, 2022.

Samples collected on July 12, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.3 ug/L) and lambda-cyhalothrin (0.04 ug/L; CGU = 500; Table 39). The PUR data associated with the exceedance indicate 211 applications of bifenthrin and cyhalothrin containing 321 lbs of AI applied across 4,459 acres of primarily nut trees and tomatoes from January 26, 2022 through July 12, 2022 (Attachment B). Water column *H. azteca* samples collected during the same sampling event resulted in 0% survival compared to the control. In addition to pyrethroids, 349 applications containing 7,205 lbs of other AI of primarily methoxyfenozide were also associated with this water column *H. azteca* exceedance. These applications were applied across 12,344 acres of primarily nut trees from April 21, 2022 through July 12, 2022.

Samples collected on September 13, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with a detection of bifenthrin (0.016 µg/L; CGU = 2; Table 39). The PUR data associated with the exceedance indicate 120 applications of bifenthrin containing 253 lbs of AI applied across 1,294 acres of nut trees March 29, 2022 through September 13, 2022 (Attachment B). Water column samples collected during the same sampling event were not toxic to *H. azteca*.

The environmental sample collected on October 11, 2022 did not result in an exceedance of the pyrethroid CGU, but did result in detections of bifenthrin (0.0017 ug/L). However, water column toxicity to *H. azteca* occurred with 40% survival compared to the control (Table 39). The PUR data indicate 325 applications containing 6,787 lbs of AI of primarily metam-sodium were associated with this exceedance and applied across 21,426 acres almonds, peppers and cantaloupes from July 19, 2022 through October 11, 2022.

Samples collected on December 5, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.59 ug/L), esfenvalerate (0.063 ug/L) and lambda-cyhalothrin (0.13 ug/L; CGU = 1000; Table 39). The PUR data associated with the exceedance indicate 259 applications of bifenthrin, esfenvalerate, and lambda-cyhalothrin containing 364 lbs of AI applied across 5,169 acres of primarily almonds from June 21, 2022 through December 5, 2022 (Attachment B). Water column samples were collected to test for toxicity to *H. azteca* and resulted in 0% survival compared to the control. In addition to pyrethroids, 205 applications containing 371 lbs of other AI of primarily chlorothalonil were also associated with the toxicity to *H. azteca*.

Samples collected on January 10, 2023 did not result in an exceedance of the pyrethroid CGU, nor were any pyrethroids detected. However, water column toxicity to *H. azteca* occurred with 0% survival compared to the control (Table 39). The PUR data indicate 172 applications containing 152 lbs of AI of primarily methoxyfenozide were associated with this exceedance and applied across 1,315 acres of crops from October 18, 2022 through January 10, 2023.

Monitoring for pyrethroids will continue at Marshall Drain near River Road in the 2023 Monitoring Period as part of the Assessment Monitoring strategy.

Table 39. Exceedances of WQTLs at Marshall Road Drain near River Road during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, CFS	DO, (< 5 mg/L)	pH, (< 6.5 or > 8.5)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	Ammonia as N mg/L (1.5 mg/L or Variable Based on pH/Temp)	Boron, (> 800 µg/L)	Pyrethroid CGU, (> 1)	*H. azteca* Water Toxicity, % Control
Irrigation	3/8/2022	9		9.32				**810**		
Irrigation	4/12/2022	14.4		9.64	919					
Irrigation	5/10/2022	14.4		9.53	1276		**0.3 (>0.23)**		**6**	17
Irrigation	7/12/2022	9	1.83	9.14	1534		**0.34 (>0.22)**		**500**	0
Non- Irrigation	9/13/2022	13.50	2.85	9.31	1218		**0.21 (>0.19 Or > 1.5)**		**2**	
Non- Irrigation	10/11/2022	13.5	3.02	9.32	1162		**0.27 (>0.23 Or > 1.5)**			40
Rain	12/5/2022	9.00	3.14	9.10		> 2419.6			**1000**	0
Non- Irrigation	1/10/2023	32.40	1.46	8.89		> 2419.6				0
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**4**	**1**	**4**	**NA**
Total Exceedances		NA	5	8	5	2	4	1	4	5

Mud Slough Upstream of San Luis Drain

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Mud Slough Upstream of San Luis Drain. Sample collection did not occur during November 2022, December 2022, and January 2023 due to the Coalition inadvertently collecting at an incorrect location (Table 30). Once it was determined that the samplers went to the wrong location, a new station was created (Santa Fe Canal at Gun Club Road, 541XSFGCR) and the data were associated with the new station. The Santa Fe Canal delivers to downstream wetlands; monitoring for boron and selenium occurs at the upstream source monitoring site Santa Fe Canal at Hwy 152 (Site M3). The Coalition does not include the Santa Fe Canal as part of its Discharge sites since it is used as a delivery system and is not designated as a receiving water for agricultural discharge.

Results from both stations are included in Attachment A; however, only exceedances from Mud Slough Upstream of San Luis Drain are discussed below. Table 40 includes all exceedances that occurred at the Mud Slough Upstream of San Luis Drain during the 2022 Monitoring Period. The site was scheduled for monitoring for management plans for boron, molybdenum, and malathion Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, there was one exceedance of the WQTL for DO recorded at 4.9 mg/L. One exceedance of the WQTL for pH occurred, recorded at 8.8. Seven exceedances of the WQTL for SC occurred, ranging from 2,206 to 4,385 µS/cm (Table 40).

E. coli

During the 2022 Monitoring Period, there were two exceedances of the WQTL for *E. coli*, with concentrations of 111.9 and 2419.6 MPN/100 mL (Table 40).

Arsenic

Monitoring for arsenic resulted in one exceedance of the WQTL (> 10 µg/L), with a value of 11 µg/L (Table 40).

Boron

Monitoring for boron resulted in nine exceedances of the WQTL (> 800 µg/L), ranging from 1710 to 3600 µg/L (Table 40).

Molybdenum

Monitoring for molybdenum resulted in eight exceedances of the WQTL (> 10 µg/L), with concentrations ranging from 13 to 45 µg/L (Table 40).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on July 12, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.005 ug/L), and lambda-cyhalothrin (0.003 ug/L; CGU = 4; Table 40). The PUR data associated with the exceedance indicate 74 applications of bifenthrin and lambda-cyhalothrin containing 481 lbs of AI applied across 5,723 acres of nut trees and tomatoes from February 10, 2022 through July 12, 2022 (Attachment B). Samples collected to test for water column toxicity to *H. azteca* during the same sampling event resulted in 75% survival compared to the control. In addition to pyrethroids, 278 applications containing 2,370 lbs of other AI of primarily trifluralin were also associated with this water column *H. azteca* exceedance.

Monitoring for pyrethroids will continue at Mud Slough Upstream of San Luis Drain in the 2023 Monitoring Period as part of the Assessment Monitoring strategy.

Table 40. Exceedances of WQTLs at Mud Slough Upstream of San Luis Drain during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	pH, (< 6.5 or > 8.5)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	Arsenic, (> 10 µg/L)	Boron, (> 800 µg/L)	Molybdenum, (> 10 µg/L)	Pyrethroid CGU, (> 1)	*H. azteca* Water Toxicity, % Control
Irrigation	3/8/2022	143			2257			**1800**			
Irrigation	4/12/2022	65.5			2767			**2400**	**13**		
Irrigation	5/10/2022	32			2925			**2200**	**15**		

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	pH, (< 6.5 or > 8.5)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	Arsenic, (> 10 µg/L)	Boron, (> 800 µg/L)	Molybdenum, (> 10 µg/L)	Pyrethroid CGU, (> 1)	*H. azteca* Water Toxicity, % Control
Irrigation	6/14/2022	38.75			2473			**2800**	**16**		
Irrigation	7/12/2022	24		8.8	4385			**3600**	**16**	4	75
Irrigation	8/9/2022							**3100**	**14**		
Non- Irrigation	9/13/2022	41.0			3018	> 2419.6	11	**2390**	**45**		
Non- Irrigation	10/11/2022	86.0	4.9		2206	1119.9		**1970**	**20**		
Non- Irrigation	2/14/2023	170.0						**1710**	**13**		
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**9**	**8**	**NA**	**NA**
Total Exceedances		NA	1	1	7	2	1	9	8	1	1

Newman Wasteway near Hills Ferry Road

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Newman Wasteway near Hills Ferry. Sample collection did not occur during January 2023 due to lack of access to the monitoring location (Table 30). Table 41 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for management plan monitoring for boron, DDE, diazinon, dimethoate, diuron, water column toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

Monitoring during the 2022 Monitoring Period resulted in six exceedances of the WQTL for DO, ranging from 1.1 to 4.3 mg/L. Six exceedances of the WQTL for SC occurred (ranging from 1087 to 2929 µS/cm; Table 41).

E. coli

During the 2021 Monitoring Period, five exceedances of the WQTL for *E. coil* occurred, ranging from 435.2 to 2419.6 MPN/100 mL (Table 41).

Boron

Monitoring for boron resulted in five exceedances of the WQTL (> 800 µg/L), ranging from 804 to 1400 µg/L (Table 41).

Table 41. Exceedances of WQTLs at Newman Wasteway near Hills Ferry Road during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances. NR refers to discharge not recorded due to instrument failure.

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	Boron, (> 800 µg/L)
Irrigation	3/8/2022	NR		2379		**1400**
Irrigation	4/12/2022	NR	2.0	2929		**1200**
Irrigation	5/10/2022	0.6	2.1	2018		**1100**
Irrigation	6/14/2022	0.55	4.3		> 2419.6	
Irrigation	7/12/2022	3	1.1		1413.6	

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	Boron, (> 800 µg/L)
Irrigation	8/9/2022	NR			435.2	
Non- Irrigation	9/13/2022	3	3.91	1087		
Non- Irrigation	10/11/2022	3	3.8	1537	1203.3	**804**
Rain	11/9/2022	3.0			> 2419.6	
Rain	12/5/2022	3.00		1089		
Non- Irrigation	2/14/2023	0				**1150**
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**5**
Total Exceedances		**NA**	**6**	**6**	**5**	**5**

Orestimba Creek at Farm Bridge Rd

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Orestimba Creek at Farm Bridge only during the January 2023 and February 2023 months. The waterbody was stagnant, dry or non-contiguous during all other scheduled monitoring events and therefore samples were not collected (Table 30). Table 42 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for monitoring for management plans for copper, arsenic, lead, chlorpyrifos, diazinon, dimethoate, DDT, DDD, DDE, water column toxicity to *C. dubia* and *S. capricornutum*, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, there were two exceedances of the WQTL for DO ranging from 1.50 to 2.48 mg/L. Two exceedances of the WQTL for pH occurred, ranging from 8.85 to 9.34 (Table 42).

E. coli

During the 2022 Monitoring Period, there was one exceedance of the WQTL for *E. coli*, with a value of 613.1 MPN/100 mL (Table 42).

Table 42. Exceedances of WQTLs at Orestimba Creek at Farm Bridge during the 2022 Monitoring Period.
Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, cfs	Oxygen, Dissolved, (< 5 mg/L)	pH, (< 6.5 Or > 8.5)	*E. coli*, (> 235 MPN/100 mL)
Non-Irrigation	1/10/2023	97.2	1.50	8.85	613.1
Non-Irrigation	2/14/2023	81.0	2.48	9.34	
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**
Total Exceedances		**NA**	**2**	**2**	**1**

Poso Slough at Indiana Ave

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Poso Slough at Indiana Avenue. Sample collection did not occur in 2022 during September, October, and November due to dry or non-contiguous waterbody conditions (Table 30). Table 43 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for monitoring for management plans for ammonia as N, arsenic, dimethoate, malathion, pyrethroids, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, three exceedances of the WQTL for DO occurred, ranging from 1.0 to 2.7 mg/L. Two exceedances of the WQTL for SC occurred with values of 911 and 917 μS/cm (Table 43).

E. coli

During the 2022 Monitoring Period, there were four exceedances of the WQTL for *E. coli*, ranging from 235.9 to >2419.6 MPN/100 mL (Table 43).

Ammonia as N

Monitoring for ammonia as N resulted in two exceedances of the variable WQTL with concentrations of 2.3 and 2.5 mg/L (Table 43).

Diuron

Diuron is a broad-spectrum herbicide used for weed control on agricultural fields, highway rights-of-way, railroads, industrial sites, and by homeowners. Diuron is highly soluble and is classified as a potential groundwater contaminant. It has a soil half-life of about 90 days and can persist in soil and water for extended periods. The diverse range of users and their specific requirements can make it difficult to determine the exact sources diuron in water quality detections.

Monitoring for diuron on April 12, 2022, and May 10, 2022 resulted in two exceedances of the WQTL (>2 μg/L) with values of 2.3 and 49 μg/L, respectively (Table 43). There were no applications associated with the exceedance in the PUR database during the relevant timeframe; the most recent prior application of diuron occurred on October 13, 2021.

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on February 14, 2023 resulted in an exceedance of the pyrethroid chronic additive CGU in the field duplicate, with a detection of bifenthrin (0.0028 ug/L; CGU = 2; Table 43). The PUR data associated with the exceedance indicate five applications of bifenthrin containing 43 lbs of AI applied across 315 acres from August 30, 2022 through February 14, 2023 (Attachment B). Water column samples collected during the same sampling event did not result in toxicity to *H. azteca*.

Samples collected on April 12, 2022 did not result in an exceedance of the pyrethroid chronic additive CGU, but did result in detections of bifenthrin (0.0008 ug/L). However, water column toxicity to *H. azteca* occurred with 76% survival compared to the control (Table 43). The PUR data indicate 185 applications containing 4,547 lbs of AI of primarily chlorothalonil were applied across 11,296 acres of crops from January 18, 2022 through March 12, 2022.

Toxicity

Water column toxicity to *S. capricornutum*

Samples collected on April 12, 2022 were toxic to *S. capricornutum* (3% growth compared to the control; Table 43). The PUR data associated with the toxicity indicate 136 applications containing 8,782 lbs of AI applied across 8,124 acres of primarily cotton and nut trees from January 19, 2022 through April 12, 2022 (Attachment B).

Table 43. Exceedances of WQTLs at Poso Slough at Indiana Ave during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances. **FD** indicates exceedance occurred in the duplicate sample only.

Season	Sample Date	Discharge, CFS	DO, (< 5 mg/L)	SC, (> 900 µS/cm)	E. coli, (> 235 MPN/100 mL)	Ammonia as N mg/L (1.5 mg/L or Variable Based on pH/Temp)	Diuron, (> 2 ug/L)	Pyrethroid CGU, (> 1)	H. azteca Water Toxicity, % Control S.	capricornutum Toxicity, % Control
Irrigation	4/12/2022	1.0	2.7		> 2419.6	2.5 (>4.2 Or > 1.5)	**49**		76	3
Irrigation	5/10/2022	1.4		911	235.9	2.3 (>3.6 Or > 1.5)	**2.3**			
Irrigation	6/14/2022	10.3	1.0							
Irrigation	7/12/2022	3.5	1.24	917						
Rain	12/5/2022	20.9			235.9					
Non- Irrigation	1/10/2023	12.5			> 2419.6					
Non-Irrigation	2/14/2023	0.4						**2 (FD)**		
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**1**	**NA**	**NA**
Total Exceedances		NA	3	2	4	2	1	1	1	1

Ramona Lake near Fig Avenue

The Coalition conducted Targeted Monitoring during April and May 2022 as scheduled in the 2022 MPU at Ramona Lake near Fig Avenue. The site was dry, non-contiguous, inaccessible, or had stagnant water during all other scheduled events (Table 30). The site was scheduled for monitoring for management plans for ammonia, boron, chlorpyrifos, DDE, and water column toxicity to *C. dubia* (Table 71).

Field Parameters

During the 2022 Monitoring Period, there was one exceedance of the WQTL for DO recorded at 4.76 mg/L. Two exceedances of the WQTL for pH occurred, both with values of at 9.6. Two exceedances of the WQTL for SC occurred, with values of 1,276 to and 1,493 µS/cm (Table 44).

Ammonia as N

Monitoring for ammonia as N resulted in one exceedance of the variable WQTL with a value of 0.35 mg/L (Table 44).

Boron

Monitoring for boron resulted in two exceedances of the WQTL (> 800 µg/L), with values of 1,000 and 1,100 µg/L (Table 44).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on May 10, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with a detection of bifenthrin (0.004 ug/L; CGU = 2; Table 44). The PUR data associated with the exceedance indicate five applications of bifenthrin containing 5 lbs of AI applied across 34 acres from February 24, 2022 through May 10, 2022 (Attachment B). Water column toxicity to *H. azteca* occurred in samples collected during the same sampling event with 22% survival compared to the control. In addition to pyrethroids, 141 applications containing 1,711 lbs of other AI (primarily chlorothalonil) were associated with the water column toxicity to *H. azteca*.

Table 44. Exceedances of WQTLs at Ramona Lake near Fig Avenue during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	pH, (< 6.5 Or > 8.5)	SC, (> 900 µS/cm)	Ammonia as N mg/L (1.5 mg/L or Variable Based on pH/Temp)	Boron, (> 800 µg/L)	Pyrethroid Chronic Goal Unit, (> 1)	*H. azteca* Water Toxicity, % Control
Irrigation	4/12/2022	9		9.69	1276		**1,100**		
Irrigation	5/10/2022	3.6	4.76	9.69	1493	**0.35 (> 0.18 Or > 1.5)**	**1,000**	2	22
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**1**	**2**	**NA**	**NA**
Total Exceedances		NA	1	2	2	1	2	1	1

Salt Slough @ Lander Avenue

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Salt Slough @ Lander Avenue.

Table 45 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for monitoring for management plans for boron, lead, and diuron (Table 71).

Field Parameters and E. coli

The 2022 Monitoring Period resulted in one exceedance of the WQTL for DO with a value of 0.8 mg/L. Eight exceedances of the WQTL for SC occurred, ranging from 1022 to 1585 µS/cm (

Table 45).

E. coli

During the 2022 Monitoring Period, there were three exceedances of the WQTL for *E. coli*, ranging from 248.1 to 272.3 MPN/100 mL (

Table 45).

Boron

Monitoring for boron resulted in two exceedances of the WQTL (> 800 μg/L), with values of 907 and 950 μg/L (

Table 45).

Molybdenum

Monitoring for molybdenum resulted in one exceedance of the WQTL (> 10 μg/L), with a concentration of 11 μg/L (

Table 45).

Toxicity

Water column toxicity to *S. capricornutum*

Samples collected on April 12, 2022 were toxic to *S. capricornutum* (44% growth compared to the control;

Table 45). The PUR data associated with the toxicity indicate 445 applications containing 21,555 lbs of AI were applied across 23,162 acres of primarily cotton and nut trees from January 18, 2022 through April 12, 2022 (Attachment B).

Table 45. Exceedances of WQTLs at Salt Slough @ Lander Avenue during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, CFS	DO, (< 5 mg/L)	SC, (> 900 µS/cm)	*E. coli*, (> 235 MPN/100 mL)	Boron, (> 800 µg/L)	Molybdenum, (> 10 ug/L)	S. capricornutum Toxicity, % Control
Irrigation	3/8/2022	171.3		1252				
Irrigation	4/12/2022	41.4		1585		**950**		44
Irrigation	5/10/2022	46.8		1088	248.1			
Irrigation	7/12/2022	30.0	0.8					
Non- Irrigation	9/13/2022	19.0		1022				
Non- Irrigation	10/11/2022	16.0		1350	248.1	**907**		
Rain	11/9/2022	66.0		1430	272.3			
Rain	12/5/2022	75.0		1192				
Non- Irrigation	1/10/2023	453.0		1138				
Non- Irrigation	2/14/2023	122.0					11	
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**2**	**NA**	**NA**
Total Exceedances		NA	1	8	3	2	1	1

Salt Slough at Sand Dam

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Salt Slough at Sand Dam. Sample collection did not occur during January 2023 due to lack of access at the monitoring location (Table 30). Table 46 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for monitoring for management plans for chlorpyrifos, diuron and water column toxicity to *C. dubia* (Table 71).

Field Parameters

The 2022 Monitoring Period resulted in one exceedance of the WQTL for DO with a concentration of 3.7 mg/L. One exceedance of the WQTL for pH occurred, with a value of 8.96 (Table 46).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on July 12, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.002 ug/L), lambda-cyhalothrin (0.002 ug/L), and cyfluthrin (0.001 ug/L; CGU = 3; Table 46). The PUR data associated with the exceedance indicate 336 applications of lambda-cyhalothrin and cyfluthrin containing 648 lbs of AI were applied across 20,200 acres of cotton, nut trees, and grain crops from January 25, 2022 through July 12, 2022 (Attachment B). Water column samples collected during the same sampling event did not result in toxicity to *H. azteca*.

Toxicity

Water column toxicity to *S. capricornutum*

Samples collected on April 12, 2022 were toxic to *S. capricornutum* (75% growth compared to the control; Table 46). The PUR data associated with the toxicity indicates 445 applications containing 21,555 lbs of AI applied across 23,162 acres of primarily cotton and nut trees from January 18, 2022 through April 12, 2022 (Attachment B).

Table 46. Exceedances of WQTLs at Salt Slough at Sand Dam during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, cfs	DO (< 5 mg/L)	pH (< 6.5 Or > 8.5)	Pyrethroid CGU (> 1)	*S. capricornutum* Toxicity, % Control
Irrigation	4/12/2022	5.0				75
Irrigation	6/14/2022	25.2		8.96		
Irrigation	7/12/2022	18.9	3.7		3	
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**
Total Exceedances		NA	**1**	**1**	**1**	**1**

San Joaquin River at Lander Avenue

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at San Joaquin River at Lander Avenue. Table 47 includes all exceedances that occurred during the 2022 Monitoring Period. This site is in a management plan for arsenic, boron, and molybdenum (Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, there was one exceedance of the WQTL for DO with a concentration of 4.3 mg/L. Two exceedances of the WQTL for pH occurred, with values of 8.85

and 8.86. Six exceed of the WQTL for SC occurred with concentrations ranging from 940 to 2,522 µS/cm (Table 47).

E. coli

During the 2022 Monitoring Period, there three exceedances of the WQTL for *E. coli*, with values ranging from 866.4 to >2,419.6MPN/100 mL (Table 47).

Arsenic

Monitoring for arsenic resulted in three exceedances of the WQTL (> 10 µg/L), with concentrations of ranging from 11 to 14 µg/L (Table 47).

Molybdenum

Monitoring for molybdenum resulted in seven exceedances of the WQTL (> 10 µg/L), with concentrations ranging from of 12 to 26 µg/L (Table 47).

Toxicity

Water column toxicity to *S. capricornutum*

Samples collected on April 12, 2022 were toxic to *S. capricornutum* (52% growth compared to the control; Table 47). The PUR data associated with the toxicity indicate 140 applications containing 807 lbs of AI applied across 8,557 acres of primarily cotton and nut trees and tomatoes from January 18, 2022 through April 12, 2022 (Attachment B).

Table 47. Exceedances of WQTLs at San Joaquin River at Lander Avenue during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances. **FD** indicates exceedance in field duplicate only.

Season	Sample Date	Discharge, CFS	DO, (< 5 MG/L)	pH, (< 6.5 OR > 8.5)	SC, (> 900 µS/CM)	*E. coli*, (> 235 MPN/100 ML)	Arsenic, (> 10 UG/L)	Molybdenum, (> 10 UG/L)	*S. capricornutum* Toxicity, % Control
Irrigation	4/12/2022	63.3				> 2419.6			52
Irrigation	5/10/2022	3.9			1439	1732.9		**13**	
Irrigation	6/14/2022	1.78		8.86	1943	866.4	**14**	**23**	
Irrigation	7/12/2022	0	4.3	8.85	2091		**15**	**25**	
Irrigation	8/9/2022	NA					**11**	**26**	
Non-Irrigation	9/13/2022	1			2522			**21**	
Non-Irrigation	10/11/2022	0			2260			**23**	
Rain	11/9/2022	74.0			940			**12 (FD)**	
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**3**	**7**	**NA**
Total Exceedances		NA	1	2	6	3	3	7	1

Westley Wasteway near Cox Road

The Coalition conducted Targeted Monitoring as scheduled in the 2022 MPU at Westley Wasteway near Cox Road. Sample collection did not occur during December 2022, January 2023, or February 2023 due to the waterbody being dry, non-contiguous, , or a lack of access to the sample location (Table 30). Table 48 includes all exceedances that occurred during the 2022 Monitoring Period. The site was scheduled for monitoring for management plans for ammonia, copper, boron, DDE, pyrethroids, and sediment toxicity to *H. azteca* (Table 71).

Field Parameters and E. coli

During the 2022 Monitoring Period, seven exceedances of the WQTL for DO occurred with concentrations ranging from 1.22 to 4.83 mg/L. Eleven exceedances of the WQTL for pH occurred, ranging from 9.10 to 9.77. Six exceedances of the WQTL for SC occurred, ranging from 961 to 1213 μS/cm (Table 48).

E. coli

During the 2022 Monitoring Period, there were seven exceedances of the WQTL for *E. coli* ranging from 235.9 to 1413.6 MPN/100 mL (Table 48).

Ammonia as N

Monitoring for ammonia as N resulted in five exceedances of the variable WQTL (variable based on pH and temperature), ranging from 0.35 to 1.3 mg/L (Table 48).

Boron

Monitoring for boron resulted in two exceedances of the WQTL (> 800 μg/L) with values of 830 and 920 μg/L (Table 48).

Pyrethroids and Water Column Toxicity to H. azteca

Samples collected on May 10, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.005 ug/L), lambda-cyhalothrin (0.003 ug/L), and permethrin (0.03 ug/L; CGU = 4; Table 48). The PUR data associated with the exceedance indicate 20 applications of bifenthrin, lambda-cyhalothrin, and permethrin containing 83 lbs of AI, applied across 1,129 acres of primarily almonds from December 15, 2021 through May 10, 2022 (Attachment B). Samples collected to test for water column toxicity to *H. azteca* resulted in toxicity with 45% survival compared to the control. In addition to pyrethroids, 83 applications containing 1,669 lbs of other AI, primarily chlorothalonil, were also associated with this water column *H. azteca* exceedance.

Samples collected on June 14, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with detections of bifenthrin (0.003 ug/L) and cypermethrin (0.001 ug/L; CGU = 4; Table 48). The PUR data associated with the exceedance indicate seven applications of bifenthrin, containing nine lbs of AI, applied across 41 acres of primarily almonds from February 22, 2022 through June 14, 2022 (Attachment B). Water column toxicity to *H. azteca* also occurred in samples collected during the same event and resulted in 70% survival compared to the control. In addition to pyrethroids, 59 applications containing 1,222 lbs of other AI, primarily chlorothalonil, were also associated with this water column *H. azteca* exceedance.

Samples collected on July 12, 2022 resulted in an exceedance of the pyrethroid chronic additive CGU with a detection of bifenthrin (0.004 ug/L; CGU = 2; Table 48). The PUR data associated with the exceedance indicate nine applications of bifenthrin, containing 48 lbs of AI, applied across 236 acres of primarily almonds from February 22, 2022 through July 12, 2022 (Attachment B). Water column toxicity to *H. azteca* occurred in samples collected during the same event and resulted in 50% survival compared to the control. In addition to pyrethroids, 98 applications containing 889 lbs of other AI, primarily methoxyfenozide, were also associated with this water column *H. azteca* exceedance.

Samples collected on August 9, 2022 did not result in an exceedance of the pyrethroid CGU, but did result in detections of bifenthrin (0.001 ug/L); however, water column toxicity to *H. azteca* occurred with 65% survival compared to the control (Table 48). The PUR data indicate 86 applications containing 838 lbs of AI, primarily paraquat dichloride, across 6,231 acres of primarily almonds from May 28, 2022 through August 9, 2022.

Table 48. Exceedances of WQTLs at Westley Wasteway near Cox Road during the 2022 Monitoring Period.

Red bolded values represent monitoring for management plan exceedances.

Season	Sample Date	Discharge, CFS	DO, (< 5 MG/L)	pH, (< 6.5 Or > 8.5)	SC, (> 900 µS/CM)	E. *coli*, (> 235 MPN/100 ML)	Ammonia as N MG/L (1.5 MG/L or Variable Based on pH/Temp)	Boron, (> 800 UG/L)	Pyrethroid CGU, (> 1)	Water H. *azteca*, (%Control)
Irrigation	3/7/2022	40.5		9.77	961					
Irrigation	3/8/2022	27		9.34				**920**		
Rain	4/12/2022	18		9.60		517.2		**830**		
Irrigation	5/10/2022	18		9.97	1144	261.3	**1 (> 0.29 Or > 1.5)**		**4**	45
Irrigation	6/14/2022	27	4.21	9.68	1008		**0.35 (> 0.19 Or > 1.5)**		**4**	70
Irrigation	7/12/2022	18	3.08	9.73		1413.6	**0.53 (> 0.14 Or > 1.5)**		**2**	50
Irrigation	8/9/2022	20.3	1.22	9.15	1213	816.4	**1.3 (> 0.29 Or > 1.5)**			65
Non- Irrigation	9/12/2022	27.0	3.24	9.39	1044					
Non- Irrigation	9/13/2022	27.0	2.87	9.35	1076	235.9	**1.1 (> 0.24 Or > 1.5)**			
Non- Irrigation	10/11/2022	9.0	3.62	9.16		344.8				
Rain	11/9/2022	9.0	4.83	9.10		365.4				
Monitoring for Management Plan Exceedances		**NA**	**NA**	**NA**	**NA**	**NA**	**5**	**2**	**3**	**NA**
Total Exceedances		NA	7	11	6	7	5	2	3	4

SOURCE WATER SITES

During the 2022 Monitoring Period, monitoring at Source Water Sites occurred along the three waterbodies used to supply irrigation water to growers in the Coalition region. Monitoring results at these sites are used to characterize the incoming irrigation source water and the results do not represent irrigation drainage discharges. The Coalition does not conduct monitoring for management plans at Source Water Sites. During the 2022 Monitoring Period, the Coalition monitored at the Source Water sites monthly for field parameters, *E. coli*, and metals (boron, copper, nickel, and zinc).

Delta Mendota Canal at DPWD

The Coalition monitored as scheduled in the 2022 MPU at Delta Mendota Canal at DPWD (Table 30).

Field Parameters and E. coli

Monitoring during the 2022 Monitoring Period resulted in 10 exceedances of the WQTL for DO (< 5 mg/L) ranging from 1.12 to 4.90. Twelve exceedances of the WQTL for pH occurred ranging from 8.76 to 9.66 (Table 49).

E. coli

During the 2022 Monitoring Period, there was one exceedance of the WQTL for *E. coli* with a value of 579.4 MPN/100 mL (Table 49).

Table 49. Exceedances of WQTLs at Delta Mendota Canal at DPWD during the 2022 Monitoring Period.

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	pH, (< 6.5 or > 8.5)	E. coli, (> 235 MPN/100 mL)
Irrigation	3/8/2022	900		9.34	
Irrigation	4/12/2022	1800		9.45	
Irrigation	5/10/2022	900	4.90	9.40	
Irrigation	6/14/2022	900	2.75	9.66	
Irrigation	7/12/2022	900	1.48	9.1	
Irrigation	8/9/2022	900	1.12	9.32	
Non-Irrigation	9/13/2022	900	2.26	9.25	
Non-Irrigation	10/11/2022	900	2.57	9.29	
Rain	11/9/2022	900	3.05	8.98	
Rain	12/5/2022	900	3.40	9.06	
Non-Irrigation	1/10/2023	900	1.75	8.76	579.4
Non-Irrigation	2/14/2023	1800	1.87	8.88	
	Total Exceedances	**NA**	**10**	**12**	**1**

San Joaquin River at PID Pumps

The Coalition monitored as scheduled in the 2022 MPU at San Joaquin River at PID Pumps (Table 30).

Field Parameters and E. coli

Monitoring during the 2022 Monitoring Period resulted in nine exceedances of the WQTL for DO, ranging from 0.80 to 3.19 mg/L. Twelve exceedances of the WQTL for pH occurred, ranging from 8.65 to 9.27. Six exceedances of the WQTL for SC occurred, ranging from 1143 to 1535 µS/cm (Table 50).

E. coli

During the 2022 Monitoring Period, there was one exceedance of the WQTL for *E. coli* with a concentration of 275.5 MPN/100 mL (Table 50).

Table 50. Exceedances of WQTLs at San Joaquin River at Sack Dam during the 2022 Monitoring Period.

Season	Sample Date	Discharge, cfs	DO, (< 5 mg/L)	pH, (< 6.5 Or > 8.5)	SC, (> 900 µS/cm)	E. coli, (> 235 MPN/100 mL)
Irrigation	3/8/2022	562.5		9.09		
Irrigation	4/12/2022	486.3		8.94		
Irrigation	5/10/2022	236.8		9.25	1335	
Irrigation	6/14/2022	133.75	3.19	9.27	1294	
Irrigation	7/12/2022	32	1.94	9.03	1573	
Irrigation	8/9/2022	112	0.80	8.99	1377	
Non-Irrigation	9/13/2022	137	2.04	9.00	1143	
Non- Irrigation	10/11/2022	0	2.70	8.98	1535	
Rain	11/9/2022	237	2.56	8.65		275.5
Rain	12/5/2022	341	3.17	8.85		
Non- Irrigation	1/10/2023	4780	1.21	9.02		
Non- Irrigation	2/14/2023	1529	2.23	9.00		
	Total Exceedances	**NA**	**9**	**12**	**6**	**1**

San Joaquin River at Sack Dam

The Coalition monitored as scheduled in the 2022 MPU at San Joaquin River at Sack Dam. However, field measures were not taken during the August 2022 event due to instrument failure. Water quality samples were collected for all months of the 2022 monitoring period (Table 30).

Field Parameters and E. coli

Monitoring during the 2022 Monitoring Period resulted in one exceedance of the WQTL for pH (8.55; Table 51).

Table 51. Exceedances of WQTLs at San Joaquin River at PID Pumps during the 2022 Monitoring Period.

Season	Sample Date	Discharge, cfs	pH, (< 6.5 Or > 8.5)
Irrigation	6/14/2022	0.35	8.55
	Total Exceedances	**NA**	**1**

WETLAND SUPPLY CHANNEL SITES

During the 2022 Monitoring Period, the Coalition conducted monthly monitoring for boron and selenium at both Wetland Supply Channel Sites as indicated in the 2022 MPU. The San Luis and Santa Fe Canals are Wetland Supply Channels that supply fresh water to private, state, and federal wetland refuges in the Coalition region. The Coalition does not conduct monitoring for management plans at Source Water sites.

Samplers accidentally sampled Santa Fe Canal at Gun Club Road instead of Mud Slough Upstream of San Luis Drain. Since the Santa Fe Canal at Gun Club Road site is not part of the WSJRWC monitoring network, the site is not included in the summary below; however, the results can be found in Attachment A.

San Luis Canal at Highway 152

The Coalition conducted monitoring as scheduled in the 2022 MPU at San Luis Canal at Highway 152 (Table 30).

Field Parameters and E. coli

During the 2022 Monitoring Period, three exceedances of the WQTL for pH occurred, ranging from 8.71 to 8.85. Six exceedances of the WQTL for SC occurred, ranging from 942 to 2257 µS/cm (Table 52).

Boron

Monitoring for boron resulted in seven exceedances of the WQTL (> 800 µg/L) with values of 837 to 3300 µg/L (Table 52).

Table 52. Exceedances of WQTLs at San Luis Canal at Highway 152 during the 2022 Monitoring Period.

SEASON	SAMPLE DATE	DISCHARGE, CFS	PH, (< 6.5 OR > 8.5)	SC, (> 900 µS/CM)	BORON, (> 800 UG/L)
Irrigation	3/8/2022	0.95	8.71	1308	1400
Irrigation	4/12/2022	2.67	8.76	2257	3300
Irrigation	6/14/2022	12.34		2077	1400
Irrigation	7/12/2022	31.7	8.85	1515	870
Irrigation	8/9/2022 *				1800
Non-Irrigation	9/13/2022	88.86		942	
Rain	12/5/2022	10.28		1066	837
Non-Irrigation	1/10/2023	9.9			844
	Total Exceedances	**NA**	**3**	**6**	**7**

*Field parameters were unable to be collected during the August 9, 2022 event due to instrument failure.

Sante Fe Canal at Highway 132

The Coalition conducted monitoring as scheduled in the 2022 MPU at Santa Fe Canal at Highway 152 (Table 30).

Field Parameters and E. coli

During the 2022 Monitoring Period, one exceedance of the WQTL for pH occurred, with a value of 8.51. Four exceedances of the WQTL for SC occurred, ranging from 1038 to 2010 µS/cm (Table 53).

Boron

Monitoring for boron resulted in seven exceedances of the WQTL (> 800 µg/L) with values of 950 and 3300 µg/L (Table 53).

Table 53. Exceedances of WQTLs at Sante Fe Canal 132 during the 2022 Monitoring Period.

SEASON	SAMPLE DATE	DISCHARGE, CFS	PH, (< 6.5 OR > 8.5)	SC, (> 900 µS/CM)	BORON, (> 800 UG/L)
Irrigation	3/8/2022	48.5		1826	1700
Irrigation	4/12/2022	14.15		2010	1900
Irrigation	5/10/2022	33.35			950
Irrigation	6/14/2022	11.58			1300
Irrigation	7/12/2022	24.86		1038	
Irrigation	8/9/2022 *	NR			1600
Non-Irrigation	9/13/2022	45.57	8.51		
Non-Irrigation	1/10/2023	273.59		1051	1230
Non-Irrigation	2/14/2023	42.47			1200
	Total Exceedances	**NA**	**1**	**4**	**7**

*Field parameters were unable to be collected during the August 9, 2022 event due to instrument failure.

COALITION ACTIONS TAKEN TO ADDRESS WATER QUALITY IMPAIRMENTS

The Coalition notifies members of all exceedances of WQTLs and works with growers to address water quality impairments. Monitoring results are disseminated to Coalition members via grower mailings, outreach meetings, and, in some cases, via personal communication. Appendix V includes copies of mailings, meeting agendas and presentations, and handouts; the Coalition provides all documents associated with outreach upon request. The Coalition encourages its members to be aware of water quality concerns, and, when applicable, implement management practices designed to improve water quality.

Coalition actions taken to address exceedances of WQTLs include 1) determining potential sources of exceedances, 2) outreach, education, and collaboration between stakeholders (including growers, RCDs, and irrigation districts) within the Coalition region, and 3) developing and meeting SQMP Performance Goals and tracking schedules (described in the sections below).

2022 MONITORING PERIOD SUBMITTALS AND APPROVALS

Summary of Required WDR Submittals and Approvals

The Coalition submitted multiple documents for approval by the Regional Water Board during the reporting period to meet the requirements of the WDR for items pertaining to surface water monitoring, groundwater monitoring, and nitrogen management. Table 54 includes a list of documents submitted and approved during the 2022 Monitoring Period.

Table 54. WSJRWC 2022 Monitoring Period submittals and approvals.

DOCUMENT DESCRIPTION	SUBMITTAL DATE	APPROVAL DATE
	Surface Water	
2022 Monitoring Plan Update	February 3, 2022	February 17, 2022
2022 Monitoring Plan Update Addendum	May 31, 2022	Pending
2022 Surface Water Annual Report	June 30, 2022	Pending
2022 San Joaquin River TMDL Annual Report	June 30, 2022	Pending
	Groundwater	
Groundwater Protection Values	July 19, 2021	
2022 Annual GQTM Report	May 1, 2023	Pending
	Nitrogen Management	
2022 AMPINAR	November 30, 2022	March 30, 2023

Exceedance Reports

All exceedances of WQTLs were reported to Regional Water Board staff via email within five business days of a sampling event or receipt of laboratory results. If any errors occurred in an original Exceedance Report, an amended report was emailed to the Regional Water Board.

Semi-Annual Submittals

As required in Attachment B to the General Order R5-2014-0002-09, the Coalition submits the Semi-Annual Monitoring Reports in an electronic format. Table 55 includes the Biannual Monitoring Report submittal schedule. Each Semi-Annual Monitoring Report includes the following data:

1. An excel workbook containing exported data that was uploaded into the California Environmental Data Exchange Network (CEDEN) comparable database,
2. The most recent eQAPP,
3. Electronic pdf copies of all field sheets,
4. Electronic submittal of site photos labeled with CEDEN comparable station codes and dates, and
5. Electronic pdf copies of all laboratory analytical reports including:
   a) Quality Control Reports including all QC samples and narratives describing QC failures, analytical errors, and anomalous occurrences,
   b) Laboratory Analytical Reports including units, RLs, MDLs, sample preparation, extraction, and analysis dates,
   c) Chain of Custody (COCs) forms, and
   d) Toxicity Reports with raw data including copies of the original bench sheets.

Table 55. WSJRWC Semi-Annual Electronic Data Submittal Schedule.

Semi-Annual Submittal Due Dates	Reporting Period
June 30	September through February of previous calendar year
November 30	March through August of calendar year

All field data sheets, site photos, laboratory reports, and COC forms were submitted semi-annually for monitoring that occurred during the 2022 Monitoring Period. Discrepancies between the COC forms and sample delivery are resolved and documented either directly on the COC or on an anomaly form completed by the laboratory.

SUMMARY OF OUTREACH, EDUCATION, AND COLLABORATION ACTIVITIES

Outreach and education activities including member mailings, meetings, and collaboration with stakeholders are an integral part of the Coalition's monitoring and reporting program. The Coalition provides information to growers through mailings, and grower meetings/workshops held at County Agricultural Commissioner's offices.

During the 2022 Monitoring Period, the Coalition held a meeting to inform members of progress in achieving water quality goals, watershed-specific monitoring results, and management practices effective at reducing agricultural runoff to waterbodies. All outreach and education activities are documented in Table 56 and materials provided to members are included in Appendix V.

The Coalition also manages a website which serves as a clearing house for information on Coalition activities and outreach (http:// https://www.westsidesjr.org/). Information provided through the website can supplement regular grower contacts and meetings. On the Coalition's website, interested entities can find information on Farm Evaluations (FEs), Irrigation and Nitrogen Management Plans (INMPs), Sediment and Erosion Control Plans (SECPs), monitoring results and current management plans, Best Management Practices (BMPs), upcoming grower workshops and meetings, and references for the ILRP.

Table 56. WSJRWC education and outreach activities during the 2022 Monitoring Period.

Outreach categories include Management Practice Tracking, BMP Outreach and Education, and Member Notification.

AREA	DATE	CATEGORY	DETAILS
Del Puerto Creek Hospital Creek Marshall Road Drain	7/6/2022	Focused Outreach	Meeting for targeted growers to address recent pyrethroid experiences and best management practice options.

MANAGEMENT PLAN ACTIVITIES AND PERFORMANCE GOALS

The Coalition conducts outreach activities designed to improve water quality in site subwatersheds with management plans. The Coalition carries out its management plan goals through a Focused Outreach process. The Focused Outreach process consists of identifying sources of water quality impairments, conducting outreach and education with targeted members, tracking management practices newly implemented as a result of outreach, and monitoring to track improvements in water quality.

The WSJRWC 2020 Revised Comprehensive SQMP incorporated the required Surface Water Management Practice Implementation Report (SW MPIR) template (submitted October 19, 2020; approved November 20, 2020). The Coalition utilizes the SW MPIR surveys to document management practices implemented by members.

The Revised 2020 Comprehensive SQMP Performance Goals describe the steps necessary to guarantee the objectives of the program are met and water quality improves in the region. The Performance Goals are:

1. Identify enrolled parcels that have the potential to contribute to the subject exceedance,
2. Each member identified as a potential source (target growers) completes the Focused Outreach (MPIR) survey indicating the current practices,

3. Hold group or individual meetings to provide recommendations for additional management practices and identify practices that members will implement those practices in the upcoming year,
4. Members implement management practices,
5. Track implementation of management practices through follow-up MPIR data, and
6. Track Management Plan effectiveness through water quality data.

The sections below describe Coalition actions to meet the Performance Goals for the 2020, 2021, and 2022 Focused Outreach watersheds. The status of each Performance Goal and associated measures/outputs are presented in Table 57 through Table 59.

Performance Goal 1

Identify enrolled parcels that have the potential to contribute to the subject exceedance.

The Coalition utilizes Focused Outreach to identify site subwatersheds with exceedances that trigger management plans (and the associated 10-year completion deadlines). If pesticides are involved, the Coalition evaluates PUR data associated with recent exceedances and member parcel information to identify targeted members. Contact letters are mailed to inform targeted members of their responsibilities, water quality impairments, and management plan strategies. Members are encouraged to attend the group meetings with Coalition representatives to assist with their SW MPIR surveys and plan implementation of additional management practices as needed.

Performance Goal 2

Each member identified as a potential source (targeted growers) completes the Focused Outreach (MPIR) survey indicating the current practices.

The purpose of the Focused Outreach packet is to inform members of recent water quality exceedances and long-standing management plans that are near the 10-year management plan completion deadline. From the packet, members can infer how their practices are potentially negatively affecting water quality downstream. Members receive the packet prior to the meeting and are asked to bring the packet with them to the meeting. The Focused Outreach packets include a cover letter, table with parcel information (crop and acreage), rationale for targeting the grower, monitoring site exceedance tally table, parcel and watershed maps, and the Focused Outreach survey.

Performance Goal 3

Hold group meetings to provide recommendations for additional management practices and identify practices that members will implement in the upcoming year.

During all group meetings with growers, Coalition representatives discuss local water quality concerns and management practices for common crops that are effective at improving water quality. To address water quality impairments, Coalition representatives discuss practices in three categories: 1) irrigation water management/storm drainage, 2) erosion and sediment management, and 3) pest management/dormant sprays.

Performance Goal 4

Members implement management practices.

During group meetings, some members may identify additional management practices they intend to implement. The Coalition follows up via mailings and phone calls the following year to determine if the planned management practices were implemented.

Performance Goal 5

Track implementation of management practices through follow-up MPIR data.

Members' management practices reported on the MPIR surveys are stored in a relational database. During Focused Outreach group meetings, some members may indicate on their MPIR survey that they plan to implement additional management practices to improve water quality. The Coalition follows up within a year to determine if the recommended practices were implemented.

Performance Goal 6

Track Management Plan effectiveness through water quality monitoring.

The Coalition conducts monitoring for management plan constituents for three years at sites in the Focused Outreach watersheds to assess water quality improvements. Improved water quality is a result of informed members implementing new management practices. After three years of Targeted Monitoring with no exceedances of the WQTL for the management plan constituent, the Coalition can submit a request for management plan completion to the Regional Water Board.

Planned Focused Outreach Activities for the 2023 Monitoring Period

In 2023, the Coalition will follow-up with targeted growers to determine if/what management practices were implemented during 2022. The final management practice analyses for the 2022 Focused Outreach watersheds will be reported in the 2024 Annual Report.

During the 2023 Monitoring Period, the Coalition plans to mail initial 2023 SW MPIR surveys to targeted growers in the 2023 Focused Outreach watersheds: Ingram Creek @ River Rd, Poso Slough @ Indiana Ave, and Westly Wasteway near Cox Rd.

The Coalition will submit the 2023 SW MPIR data in the November 30, 2023, Annual Management Practice Implementation and Nitrogen Application Report (AMPINAR). The Focused Outreach analysis, including documenting changes in practices and the status of meeting Performance Goals and Measures, will continue to be provided annually in the June 30 Annual Report.

Table 57. Performance Goals status for 2021–2023 Focused Outreach watersheds (Blewett Drain and Mud Slough).
X – planned to occur in marked year. Grey cells indicate years are not applicable due to complete output.

Goal	Performance Measure	Outputs	Annual Report Year		
			2021	2022	2023
1	Performance Measure 1.1: Identify parcels and associated members that have the potential to discharge to the receiving waterbody under the Management Plan	List of parcels and member contact information (Internal) in the watershed.	Complete	Complete	In Progress
1	Performance Measure 1.2: Identify the likely source(s) using other available data (such as pesticide use reports or cropping data).	List of targeted growers that will be contacted for outreach (Internal).	Complete	Complete	In Progress
2	Performance Measure 2.1: 100% of targeted growers complete the initial Focused Outreach survey.	Responses from targeted growers incorporated into a database.	Complete	Complete	In Progress
2	Performance Measure 2.2: 100% of targeted growers are contacted about meeting with a Coalition representative, either in a group or individually.	Quarterly updates to the Regional Water Board on progress in scheduling meetings with growers.	Complete	Complete	In Progress
3	Performance Measure 3.1: 100% of the targeted growers attend meetings within a year of being identified.	Quarterly updates to the Regional Water Board on progress in scheduling meetings with growers.	Complete	Complete	X
3	Performance Measure 3.2: Targeted members identify additional practices to implement based on information discussed during Focused Outreach meetings.	List of management practices targeted growers will implement (Internal).	Complete	Complete	X
3	Performance Measure 3.3: The Coalition tracks the practices that the targeted grower(s) plan to implement over the following year.	Incorporation of management practices identified by targeted growers for implementation into a Focused Outreach survey database.	Complete		
4	Performance Measure 4.1: 100% of the targeted growers implement the additional practices they identified as appropriate for their farming operation.	List of targeted growers and the management practices implemented. Reporting on implemented practices in the Annual Report.	X		
5	Performance Measure 5.1: Document that 100% of targeted growers planning to implement additional management practices did implement those practices.	List of targeted growers and the management practices implemented. Reporting on implemented practices in the Annual Report.	X	In Progress	
6	Performance Measure 6.1: Review water quality monitoring data to track changes in water quality within the watershed and evaluate the effectiveness of implemented practices.	Summary of water quality results and discussion included in the Annual Report.	X	X	In Progress

Table 58. Performance Goals status for 2022–2024 Focused Outreach watersheds (Del Puerto Creek, Hospital Creek, and Marshall Rd/Spanish Land Grant).

X – planned to occur in marked year. Grey cells indicate years are not applicable due to complete output.

Goal	Performance Measure	Outputs	Annual Report Year		
			2022	2023	2024
1	Performance Measure 1.1: Identify parcels and associated members that have the potential to discharge to the receiving waterbody under the Management Plan	List of parcels and member contact information (Internal) in the watershed.	Complete	In Progress	
1	Performance Measure 1.2: Identify the likely source(s) using other available data (such as pesticide use reports or cropping data).	List of targeted growers that will be contacted for outreach (Internal).	Complete	In Progress	
2	Performance Measure 2.1: 100% of targeted growers complete the initial Focused Outreach survey.	Responses from targeted growers incorporated into a database.	Complete	X	
2	Performance Measure 2.2: 100% of targeted growers are contacted about meeting with a Coalition representative, either in a group or individually.	Quarterly updates to the Regional Water Board on progress in scheduling meetings with growers.	Complete	X	
3	Performance Measure 3.1: 100% of the targeted growers attend meetings within a year of being identified.	Quarterly updates to the Regional Water Board on progress in scheduling meetings with growers.	Complete	X	
3	Performance Measure 3.2: Targeted members identify additional practices to implement based on information discussed during Focused Outreach meetings.	List of management practices targeted growers will implement (Internal).	Complete	X	
3	Performance Measure 3.3: The Coalition tracks the practices that the targeted grower(s) plan to implement over the following year.	Incorporation of management practices identified by targeted growers for implementation into a Focused Outreach survey database.			
4	Performance Measure 4.1: 100% of the targeted growers implement the additional practices they identified as appropriate for their farming operation.	List of targeted growers and the management practices implemented. Reporting on implemented practices in the Annual Report.			
5	Performance Measure 5.1: Document that 100% of targeted growers planning to implement additional management practices did implement those practices.	List of targeted growers and the management practices implemented. Reporting on implemented practices in the Annual Report.	In Progress		
6	Performance Measure 6.1: Review water quality monitoring data to track changes in water quality within the watershed and evaluate the effectiveness of implemented practices.	Summary of water quality results and discussion included in the Annual Report.	X	In Progress	

Table 59. Performance Goals status for 2023–2025 Focused Outreach watersheds (Ingram Creek @ River Rd, Poso Slough @ Indiana Ave, and Westly Wasteway near Cox Rd).

X – planned to occur in marked year. Grey cells indicate years are not applicable due to complete output.

Goal	Performance Measure	Outputs	Annual Report Year		
			2023	2024	2025
1	Performance Measure 1.1: Identify parcels and associated members that have the potential to discharge to the receiving waterbody under the Management Plan	List of parcels and member contact information (Internal) in the watershed.	In Progress		
1	Performance Measure 1.2: Identify the likely source(s) using other available data (such as pesticide use reports or cropping data).	List of targeted growers that will be contacted for outreach (Internal).	X		
2	Performance Measure 2.1: 100% of targeted growers complete the initial Focused Outreach survey.	Responses from targeted growers incorporated into a database.	X		
2	Performance Measure 2.2: 100% of targeted growers are contacted about meeting with a Coalition representative, either in a group or individually.	Quarterly updates to the Regional Water Board on progress in scheduling meetings with growers.	X		
3	Performance Measure 3.1: 100% of the targeted growers attend meetings within a year of being identified.	Quarterly updates to the Regional Water Board on progress in scheduling meetings with growers.	X		
3	Performance Measure 3.2: Targeted members identify additional practices to implement based on information discussed during Focused Outreach meetings.	List of management practices targeted growers will implement (Internal).	X		
3	Performance Measure 3.3: The Coalition tracks the practices that the targeted grower(s) plan to implement over the following year.	Incorporation of management practices identified by targeted growers for implementation into a Focused Outreach survey database.	X		
4	Performance Measure 4.1: 100% of the targeted growers implement the additional practices they identified as appropriate for their farming operation.	List of targeted growers and the management practices implemented. Reporting on implemented practices in the Annual Report.	X		
5	Performance Measure 5.1: Document that 100% of targeted growers planning to implement additional management practices did implement those practices.	List of targeted growers and the management practices implemented. Reporting on implemented practices in the Annual Report.	X		
6	Performance Measure 6.1: Review water quality monitoring data to track changes in water quality within the watershed and evaluate the effectiveness of implemented practices.	Summary of water quality results and discussion included in the Annual Report.	In Progress		

MEMBER ACTIONS TAKEN TO ADDRESS EXCEEDANCES OF WATER QUALITY OBJECTIVES

Each year, targeted Coalition members are responsible for completing MPIR surveys during Focused Outreach to document farm management practices, sediment and erosion control practices, and nitrogen use. All members are required to attend an annual member meeting and pay annual membership dues.

MANAGEMENT PRACTICES

Management practices growers can implement to address water quality impairments are reflective of the practices listed on the SW MPIR surveys and discussed by Coalition representatives at Focused Outreach meetings (Table 60).

Table 60. Management practices and associated categories.

CATEGORY	MANAGEMENT PRACTICE
Irrigation Water Management/ Storm Drainage	Laser leveled fields
	Use drainage basins (and sediment ponds) to capture and retain runoff
	Recirculation - tailwater return system
	Use of polyacrylamide (PAM)
	Scheduling irrigations with information from various sources
	Install drainage basins (settling ponds)
	Conducting controlled releases to manage storm drainage
	Install and/or improve berms between field & waterway
Erosion and Sediment Management	Grass row centers (orchards, vineyards)
	Maintain vegetated filter strips around field perimeter at least 10' wide
	Vegetation is planted along or allowed to grow along ditches
	Constructed wetlands
Pest Management/ Dormant Spray Management	Adjust spray nozzles to match crop canopy profile
	Outside nozzles shut off when spraying outer rows next to sensitive sites
	Use of nozzles that provide largest effective droplet size
	Spray areas close to waterbodies when the wind is blowing away
	Use electronic controlled sprayer nozzles
	Air blast applications when wind is between 3-10mph & upwind of sensitive site
	Maintain setbacks
	Check weather conditions prior to spraying (precipitation status)
	Not applying dormant sprays when soil moisture is at field capacity

When there are reoccurring water quality impairments in watersheds, the Coalition may initiate additional outreach in the watershed even if outreach has occurred in the past. Persistent water quality impairments where Focused Outreach already occurred could be due to:

- Changes in land ownership resulting in a grower new to the area who may not have been contacted previously for outreach,
- New lease agreements where an individual who farms a member's parcels may not have received Focused Outreach in the past,

- Changes in the crops resulting in inadequate management practice implementation,
- Discharge from non-Coalition growers,
- Targeted member(s) not implementing management practices to reduce offsite discharge, and /or
- The targeting process does not include a parcel(s) where applications could contribute to exceedances.

2021 Focused Outreach Summary of Management Practices (2021-2023)

The 2021 Focused Outreach watersheds included Blewett Drain (12 growers) and Mud Slough (15 growers).

Initial contact letters were mailed to growers on June 10, 2021, informing them of the watershed group meeting dates on June 23, 2021 (Blewett Drain) and June 24, 2021 (Mud Slough). Initial Focused Outreach surveys were completed by 100% of the targeted growers. Follow-up surveys were mailed on May 3, 2023, to growers who indicated that they planned to implement additional management practices (1 grower total). Table 61 includes a tally of 2021 Focused Outreach targeted members, meeting attendees, follow-up surveys, and members who implemented new practices.

A summary of the 2021 Focused Outreach watersheds' management practices along with the targeted member parcel maps were included in the 2022 Annual Report (submitted June 30, 2022).

Table 61. Tally of members targeted for 2021 Focused Outreach watersheds (2021-2023).

Focused Outreach Actions	Blewett Drain	Mud Slough
Targeted Growers	12	15
Attended Meeting	12	15
Follow-up Contacts Required (new management practices planned to be implemented)	4	0
Completed Follow-up Contact	4	N/A
Growers with Newly Implemented Practices	4	N/A
Percent Complete (Initial Contact)	**100%**	**100%**
Percent Complete (Follow-up Contact)	**100%**	**N/A**

Summary of Implemented Management Practices

The Coalition is awaiting the response from the grower who was sent a follow-up survey to determine if new management practices were implemented. Results from the follow-up response will be reported in the 2023 AMPINAR (due November 30, 2022) and an analysis will be reported in the 2024 Annual Report.

2022 Focused Outreach Summary of Management Practices (2022-2024)

The 2022 Focused Outreach watersheds include Del Puerto Creek (11 growers), Hospital Creek (8 growers), and Marshall Rd Drain/Spanish Land Grant Drain (19 growers). Initial contact letters were mailed to all targeted growers on June 10, 2022, informing them of the watershed group meeting on July 6, 2022. The 2022 Focused Outreach surveys required growers to indicate if they planned to implement new management practices (Planned Management Practices). Eighty-seven percent of the 2022 Focused Outreach surveys were returned to the Coalition (Table 62). Seven growers indicated they planned to implement additional management practices before the fall of 2023. The irrigated acreage associated with targeted growers in comparison to the acreage identified as directly draining to the waterway is provided in Table 63.

The Coalition will mail out follow-up surveys in fall of 2023 to confirm these seven growers implemented new management practices.

Table 62. Tally of members who participated in 2022 Focused Outreach and require follow-ups.

Focused Outreach Actions	Del Puerto Creek	Hospital Creek	Marshall Rd Drain/Spanish Land Grant Drain	Grand Total
Targeted Growers	11	8	19	38
Attended Meeting	9	4	14	27
Initial Surveys Returned	11	5	17	33
Follow-up Contacts Required	4	1	2	7
Percent Complete (Initial Contact)	**100%**	**63%**	**79%**	**82%**

Table 63. 2022 Focused Outreach watershed acreage associated with targeted growers.

Acreages	Del Puerto Creek	Hospital Creek	Marshall Rd Drain/Spanish Land Grant Drain
Targeted Irrigated Acreage	952	2,814	1,861
Direct Drainage Acreage (acres directly draining to waterway)	3,132	6,267	4,949
Percent Acreage Represented by Targeted Members Compared to Total Targeted Acreage	30%	45%	38%

Del Puerto Creek

Growers with acreage identified as direct drainage and within 200 yards from the waterbody were targeted for Focused Outreach in the Del Puerto Creel watershed (952 targeted irrigated acres). Parcels were included in 2022 Focused Outreach if pesticide applications within the past three years were associated with exceedances of the WQTLs for pyrethroids.

The Coalition has documented management practices for 100% of targeted members in the watershed (11 of 11 surveys received; Table 62). Results from Focused Outreach surveys including management practices directed towards irrigation water management, storm drainage, erosion and sediment management, pest management, and dormant spray management are presented in Table 64.

Of the 11 Del Puerto Creek growers who completed their surveys, four growers identified additional management practices to implement (Table 67). Follow-up surveys will be sent in fall 2023 to confirm what additional practices were implemented since July 2022.

Table 64. Del Puerto Creek watershed targeted members' current management practices (2022).

Section	Question	Answer	Count of Respondents	Sum of Acreage
Section 1: Irrigation Water Management	Do you have irrigation drainage?	No	11	1,025
	Irrigation management practices:	Laser leveled fields	6	697
		Use of drainage basins (sediment ponds) to capture and retain runoff	1	39
	Irrigation system:	Drip	8	484
		Sprinkler	4	605
		Microirrigation	3	127
	What information is used to schedule irrigations	Crop condition	9	932
		Irrigations are not scheduled to predetermined frequency	8	898
		Plant water status evaluated either visually or using a pressure chamber	8	720
		Regional evapotranspiration (ET) data	9	932
		Soil moisture regularly evaluated using tensiometers, electrical resistance blocks, manual soil probes, neutron probes, etc.	8	898
		Soil type	9	932
		Weather	9	932
Section 2: Storm Drainage	Do you have storm water draining from your field?	Yes	4	166
		No	7	859
	When do you have storm water draining from your field?	Only in heavy storms	4	166
	How are you able to manage storm drainage?	Berms that can control water between fields and waterway	3	101
		Controlled release into waterway	1	34
		Settling pond	1	39
Section 3: Erosion and Sediment Management	Sediment management practices:	Constructed wetlands	1	212
		Grass row centers	10	813
		Maintain vegetated filter strips around field perimeter at least 10' wide	1	34
		Vegetation planted or allowed to grow in or along ditches	6	407
Section 4: Pest Management	Spray management practices:	Adjust spray nozzles to match crop canopy profile	11	1,025
		Outside nozzles shut off when spraying outer rows next to sensitive sites	11	1,025
		Spray areas close to waterbodies when the wind is blowing away from them	10	960
		Use electronic controlled sprayer nozzles	8	919
		Use air blast applications when wind is between 3-10 mph and upwind of a sensitive site	9	952
		Uses of nozzles that provide largest effective droplet size to minimize drift	11	1,025
	Do you plan to use any of the following?	Pyrethroids	6	239
	How often is spray equipment calibrated?	Prior to each application	6	667
		Monthly	2	104
		Annually	3	254

Section	Question	Answer	Count of Respondents	Sum of Acreage
Section 5: Dormant Spray Management	Do you apply dormant sprays?	No	8	913
		Yes	3	112
	How many acres are sprayed with dormant insecticides?	1-100	2	73
		101-200	1	39
	Prior to applying winter dormant sprays, what is the condition of your orchard floor?	Some vegetation	1	9
		Vegetative cover with sprayed berms	2	103
	Dormant spray management practices?	Check weather conditions prior to spraying (i.e. storm status)	3	112
		Maintaining setbacks	3	112
		Not applying when soil moisture is at field capacity	3	112

Hospital Creek

Growers with acreage identified as direct drainage and within 200 yards from the waterbody were targeted for Focused Outreach in the Hospital Creek watershed (2,814 irrigated acres). Parcels were included in 2022 Focused Outreach if pesticide applications within the past three years were associated with water column exceedances of the CGU for pyrethroids.

The Coalition documented management practices for 63% of targeted members in the watershed (5 of 8 surveys received; Table 62). Results from Focused Outreach surveys including management practices directed towards irrigation water management, storm drainage, erosion and sediment management, pest management, and dormant spray management are presented in Table 65.

Of the 5 growers who have completed their surveys, one grower identified additional management practices to implement (Table 67). A follow-up survey will be sent in fall 2023 to confirm what practices were implemented. The Coalition continues to follow up with the remaining three growers who have not returned an initial survey.

Table 65. Hospital Creek watershed targeted member's current management practices (2022).

Section	Question	Answer	Count of Respondents	Sum of Acreage
Section 1: Irrigation Water Management	Do you have irrigation drainage?	Yes	1	600
		No	4	1,466
	Irrigation management practices:	Laser leveled fields	3	1,026
		Recirculation – tailwater return system	1	600
		Use drainage basins (sediment ponds) to capture and retain runoff	2	1,590
	Irrigation system:	Drip	3	476
		Microirrigation	2	700
		Sprinkler	1	990
	What information is used to schedule irrigations:	Crop condition	3	476
		Irrigations are not scheduled to predetermined frequency	2	150
		Plant water status evaluated either visually or using a pressure chamber	3	476
		Regional evapotranspiration (ET) data	2	376

Section	Question	Answer	Count of Respondents	Sum of Acreage
		Soil moisture regularly evaluated using tensiometers, electrical resistance blocks, manual soil probes, neutron probes, etc.	3	476
		Soil type	3	476
		Weather	3	476
Section 2: Storm Drainage	Do you have storm water draining from your field?	No	5	2,066
Section 3: Erosion and Sediment Management	Sediment management practices:	Grass row centers	5	2,066
		Maintain vegetated filter strips around field perimeter at least 10' wide	1	990
		Vegetation planted or allowed to grow in or along ditches	3	1,690
Section 4: Pest Management	Spray management practices:	Adjust spray nozzles to match crop canopy profile	5	2,066
		Outside nozzles shut off when spraying outer rows next to sensitive sites	5	2,066
		Spray areas close to waterbodies when the wind is blowing away from them	5	2,066
		Use air blast applications when wind is between 3-10 mph and upwind of a sensitive site	5	2,066
		Use electronic controlled sprayer nozzles	3	1,026
		Uses of nozzles that provide largest effective droplet size to minimize drift	5	2,066
	Do you plan to use any of the following?	Pyrethroids	2	700
	How often is spray equipment calibrated?	Prior to each application	4	2,016
		Annually	1	50
Section 5: Dormant Spray Management	Do you apply dormant sprays?	Yes	2	1,090
		No	3	976
	How many acres are sprayed with dormant insecticides?	201-300	1	100
		301-400	1	990
	Prior to applying winter dormant sprays, what is the condition of your orchard floor?	Vegetative cover	1	990
		Vegetative cover with sprayed berms	1	100
	Dormant spray management practices?	Check weather conditions prior to spraying (i.e. storm status)	2	1,090
		Maintaining setbacks	2	1,090
		Not applying when soil moisture is at field capacity	2	1,090

Marshall Rd Drain and Spanish Land Grant Drain

Growers with acreage identified as direct drainage and within 200 yards from the waterbody were targeted for Focused Outreach in the Marshall Rd Drain and Spanish Land Grant Drain watershed (1,861 irrigated acres). Parcels were included in 2022 Focused Outreach if pesticide applications within the past three years were associated with exceedances of the pyrethroid CGU.

The Coalition documented management practices for 89% of targeted members in the watershed (17 of 19 surveys received; Table 62). Results from Focused Outreach surveys including management practices directed towards irrigation water management, storm drainage, erosion and sediment management, pest management, and dormant spray management are presented in Table 66.

Of the 17 growers who have completed their surveys, two growers identified additional management practices to implement (Table 67). Two follow-up surveys will be sent in fall 2023 to confirm what additional practices were implemented. The Coalition continues to follow up with the remaining three growers who have not returned an initial survey.

Table 66. Marshall Rd Drain and Spanish Land Grant Drain watershed targeted member's current management practices (2022).

Section	Question	Answer	Count of Respondents	Sum of Acreage
Section 1: Irrigation Water Management	Do you have irrigation drainage?	Yes	7	910
		No	10	930
	Irrigation management practices:	Laser leveled fields	8	1,140
		Recirculation – tailwater return system	1	30
		Use drainage basins (sediment ponds) to capture and retain runoff	5	557
		Use polyacrylamide (PAM) to increase infiltration and reduce furrow erosion	2	426
	Irrigation system:	Flood	6	907
		Furrow	7	902
		Sprinkler	2	432
		Microirrigation	2	80
		Drip	7	993
	What information is used to schedule irrigations:	Crop condition	13	1,676
		Irrigations are not scheduled to predetermined frequency	9	1,531
		Plant water status evaluated either visually or using a pressure chamber	9	1,442
		Regional evapotranspiration (ET) data	10	1,463
		Soil moisture regularly evaluated using tensiometers, electrical resistance blocks, manual soil probes, neutron probes, etc.	9	1,387
		Soil type	12	1,649
		Weather	13	1,676
Section 2: Storm Drainage	Do you have storm water draining from your field?	Yes	9	621
		No	8	1,220
	When do you have storm water draining from your field?	Only in heavy storms	7	570
		After soil is saturated in late winter	2	51
	How are you able to manage storm drainage?	Berms that can control water between fields and waterway	1	80
		Settling pond	4	161
Section 3: Erosion and Sediment Management	Sediment management practices:	Grass row centers	8	1,263
		Maintain vegetated filter strips around the field perimeter at least 10' wide	3	533
		Vegetation planted or allowed to grow in or along ditches	9	1,129
Section 4: Pest Management	Spray management practices:	Adjust spray nozzles to match crop canopy profile	15	1,733
		Outside nozzles shut off when spraying outer rows next to sensitive sites	14	1,762
		Spray areas close to waterbodies when the wind is blowing away from them	13	1,682

Section	Question	Answer	Count of Respondents	Sum of Acreage
		Use air blast applications when wind is between 3-10 mph and upwind of a sensitive site	7	953
		Use electronic controlled sprayer nozzles	2	101
		Uses of nozzles that provide largest effective droplet size to minimize drift	16	1,813
	Do you plan to use any of the following?	Pyrethroids	5	1,157
	How often is spray equipment calibrated?	Annually	2	62
		Monthly	1	22
		Prior to each application	14	1,756
Section 5: Dormant Spray Management	Do you apply dormant sprays?	Yes	5	968
		No	12	873
	How many acres are sprayed with dormant insecticides?	1-100	3	331
		101-200	1	156
		301-400	1	481
	Prior to applying winter dormant sprays, what is the condition of your orchard floor?	Some vegetation	3	331
		Vegetative cover with sprayed berms	2	637
	Dormant spray management practices?	Check weather conditions prior to spraying (i.e. storm status)	5	968
		Maintaining setbacks	5	968
		Not applying when soil moisture is at field capacity	5	968
		Does not apply dormant spray	1	156

Table 67. Planned management practices for targeted growers in Del Puerto Creek, Hospital Creek, and Marshall Rd Drain/Spanish Land Grant Drain watersheds.

Watershed	Planned Management Practices	Growers	Acreage
Del Puerto Creek	Recirculation – tailwater return system	1	212
	Use drainage basins (sediment ponds) to capture and retain runoff	1	212
	Soil moisture regularly evaluated using tensiometers, electrical resistance blocks, manual soil probes, neutron probes, etc.	1	34
	Berms that can control water between fields and waterway	1	65
	Spray areas close to waterbodies when wind blows away from waterbody	1	65
	Vegetation planted or allowed to grow in or along ditches	1	13
Hospital Creek	Use polyacrylamide (PAM) to increase infiltration and reduce furrow erosion	1	600
Marshall Rd Drain/Spanish Land Grant Drain	Berms that can control water between fields and waterway	1	40
	Recirculation – tailwater return system	1	404
	Maintain vegetated filter strips around the field perimeter at least 10' wide	1	404
	Vegetation planted or allowed to grow in or along ditches	1	404

SEDIMENT DISCHARGE AND EROSION CONTROL PLAN

All Coalition members are required to implement sediment discharge and erosion prevention practices. Table 68 includes all submittal and approval dates associated with the Coalition's Sediment Discharge and Erosion Assessment Report (SDEAR).

Table 68. WSJRWC SDEAR associated submittal and approval dates.

DOCUMENT	SUBMITTAL DATE	APPROVAL DATE
SDEAR	March 16, 2015	November 25, 2015 (Conditional)
SDEAR Addendum- Proximity Work Plan	March 23, 2016	September 12, 2016 (Conditional)
SDEAR- Phase I Proximity to Major Waterbodies	January 31, 2017	April 27, 2018
SDEAR- Phase II Proximity to Secondary Waterbodies	August 31, 2018	August 19,2019
SDEAR-Phase III Constructed Waterway Open System Analysis	January 31, 2019	August 19, 2019
SDEAR- Phase IV Closed System Analysis	April 15, 2019	August 19, 2019

The Coalition utilized a variant of the Revised Universal Soil Loss Equation (RUSLE combined with Total Suspended Solids and current Sediment Management Plans) and proximity to waterbodies (major and secondary) to identify areas where growers were required to complete Sediment and Erosion Control Plans (SECPs). Table 69 includes SECP certification due dates for parcels identified in each of the three phases of the proximity analyses.

Table 69. Member parcels requiring the SECP due to the RUSLE output value and/or proximity analyses.

SECP CATEGORY	MEMBER PARCEL COUNT[1]	DATE CERTIFICATION REQUIRED
Exempt RUSLE parcels (adjacent to waterway with hydraulic barrier, low field elevation, riparian area, and/or non-agriculture use)[2]	144	N/A
Required due to RUSLE and Phase 1 Proximity to Major Waterbodies	1612	October 27, 2018
Phase II Proximity to Secondary Waterways	298	February 19, 2020
Phase III and IV parcels Open and Closed System Analysis	292	August 15, 2020

[1] – The counts of member parcels change with enrollment updates and proximity exemption forms. Data as of July 2020.

[2] – No SECP is required for parcels identified as being exempt.

The Coalition offers SECP assistance to growers by providing a list of certified professionals with knowledge of erosion control and capability to evaluate sites for the need to implement erosion management practices. Coalition Staff assists members with SECP related questions through phone calls and emails. Common questions include proper understanding of the FE sediment and erosion question, how to correctly complete the SECP template, how to certify the SECP, and why the SECP is required for their property.

STATUS OF SPECIAL PROJECTS

Special projects in the WSJRWC region include monitoring to address management plans and TMDL compliance monitoring as required by the WDR (Attachment B, Page 4). During the 2022 Monitoring Period, the Coalition monitored in accordance with the Basin Plan requirements for chlorpyrifos and diazinon and the pyrethroid control program TMDL monitoring, the 2022 MPU, the WDR (Order No. R5-2014-0002-09), and the WSJRWC Comprehensive and Constituent-Specific SQMPs (approved August 7, 2018). A management plan is required if more than one exceedance occurs of the WQTL of a constituent at a given location within a three-year period.

MANAGEMENT PLAN UPDATES

When a management plan is developed for a monitoring site, additional Focused Outreach efforts in the watershed are required. Management plan efforts include, but are not limited to:

1. Monitoring as outlined in the Coalition's approved WDR and/or monitoring to address management plans,
2. Analyzing PUR data,
3. Conducting watershed outreach and education meetings,
4. Encouraging and evaluating implementation of management practices, and
5. Assessing compliance with load limits for TMDLs.

A narrative concerning each monitoring constituent is provided in the Coalition's Comprehensive and Constituent-Specific SQMPs, including the strategy to meet the 10-year compliance requirements for management plan completion as soon as practicable.

STATUS OF MANAGEMENT PLANS

The Coalition's management plan strategy has been effective in addressing water quality impairments. Focused Outreach has resulted in greater awareness of water quality concerns and the implementation of management practices designed to reduce the offsite movement of agricultural constituents and sediment. The Coalition evaluated monitoring results and concluded that water quality continues to improve throughout the Coalition region. The completion of management plans in watersheds where Focused Outreach occurred indicates that implemented management practices are effective.

Table 70 includes the submittal and approval dates and the total number of management plans approved for completion. Table 71 lists current management plans, constituents approved for management plan completion, and reinstated management plans.

The Coalition has received approval to complete 74 management plans for 18 sites (Table 70). Seven management plans have been reinstated due to additional exceedances of the WQTLs. There are 194 active management plans for 17 monitoring sites (Table 71).

Table 70. Number of complete management plans and submittal/approval dates.

Submittal Date	Management Plans Requested for Completion	Management Plans Approved for Completion	Approval Date
12/29/2017	2	2	6/14/2019
12/28/2018	29	28	6/14/2019
12/24/2019	43	43	2/14/2020
Total	**74**	**68***	**NA**

*Does not include management plans that have been reinstated.
NA – Not applicable.

Table 71. Status of WSJRWC management plan constituents per active monitoring site prior to 2022 Monitoring Period results.

Active – X, Re-instated—light grey cell, Completed – dark grey cell.

Watersheds	DO	pH	SC	Total Dissolved Solids	Ammonia as N	Nitrate and Nitrite as N	*E. coli*	Copper	Arsenic	Boron	Lead	Molybdenum	Nickel	Selenium	Chlordane, trans-	Chlorpyrifos	DDD	DDE	DDT	Diazinon	Dimethoate	Diuron	HCH, alpha-	HCH, delta-	Malathion	Parathion, Methyl	Simazine	*Pimephales promelas*	*Selenastrum*	*Ceriodaphnia dubia*	*Hyalella azteca (Sed)*	*Hyalella Azteca (WC)*	Pyrethroids	Grand Total
Blewett Drain @ Highway 132	X	X	X	X			X	X								X		X													X		X	10
Del Puerto Creek @ Highway 33	X	X	X	X			X			X								X								X					X		X	10
Del Puerto Creek near Cox Road	X	X	X	X			X			X								X													X	X	X	10
Hospital Creek @ River Road	X	X	X	X			X		X	X	X		X					X	X											X	X	X	X	15
Ingram Creek @ River Road	X	X	X	X		X	X		X	X	X					X		X												X	X	X	X	15
Los Banos Creek @ China Camp Road	X	X	X	X	X		X		X	X		X																						9
Los Banos Creek @ Highway 140	X	X	X	X			X		X	X		X																			X			9
Marshall Road Drain near River Road	X	X	X	X	X		X		X	X	X					X		X			X	X							X	X		X	X	17
Mud Slough Upstream of San Luis Drain	X	X	X	X			X			X		X													X									8
Newman Wasteway near Hills Ferry Road	X	X	X	X			X			X								X		X	X	X							X		X		X	13
Orestimba Creek @ Farm Bridge	X	X	X	X		X	X	X	X		X			X		X	X	X	X	X	X								X	X	X			19
Poso Slough @ Indiana Ave	X	X	X	X	X		X		X												X				X						X	X	X	12
Ramona Lake near Fig Ave	X	X	X	X	X		X			X						X		X												X				10
Salt Slough @ Lander Ave	X	X	X	X			X			X	X											X												8
Salt Slough @ Sand Dam	X	X	X	X			X									X						X								X			X	9
San Joaquin River @ Lander Ave	X	X	X	X			X		X	X		X																						8
Westley Wasteway near Cox Road	X	X	X	X	X		X	X		X								X													X	X	X	12
Total Completed	0	0	0	0	2	3	0	4	1	0	1	1	1	0	1	8	0	0	4	3	1	8	1	1	6	3	1	1	8	6	1	0	0	66
Total Reinstated	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	6
Total Active	17	17	17	17	4	2	17	3	6	13	5	4	1	1	0	6	1	10	2	2	3	4	0	0	2	1	0	0	3	5	9	6	10	188

New Management Plans Required After 2022 Monitoring Period

New site/constituent management plans are required as a result of monitoring from the 2022 Monitoring Period. Exceedances in the 2022 Monitoring Period resulted in three new management plans: toxicity to *S. capricornutum* (1), and pyrethroids (2). In addition, there were three reinstated management plans due to new exceedances in the 2022 Monitoring Period: selenium (1), diuron (1), and *S. capricornutum* (1; Table 72). Table 72 is a tally of exceedances from the 2022 Monitoring Period and notation of existing, new and reinstated management plans.

Table 72. WSJRWC 2022 exceedance tally and new management plans for 2023 Monitoring Period.

Sites are listed alphabetically. Constituents are grouped by field measures and laboratory results and then listed alphabetically. Blue highlighted cells indicate current management plans, dark green highlights indicate new sites/constituents management plans, and light green indicates reinstated management plans for the 2023 Monitoring Period.

Site Name	Oxygen, Dissolved	pH	Specific Conductivity	*E. coli*	Ammonia as N	Arsenic	Boron	Copper	Molybdenum	Selenium	DDE	DDT	Diuron	Methomyl	Pyrethroids	Toxicity to *C. dubia*	Toxicity to *S. capricornutum*	Toxicity to *H. azteca* (SED)
Blewett Drain at Highway 132	7	8		1											3			
Del Puerto Creek at Highway 33	6	10	5	4			3								1			1
Del Puerto Creek near Cox Road	9	13	8	6			1								1			
Hospital Creek at River Road	7	11	4	5			3								2			1
Ingram Creek at River Road	9	13	7	4							1	1		1	5			2
Los Banos Creek @ Hwy 140	4		7	7		4	8		5	2					2	1		
Los Banos Creek at China Camp Road	6	3	6	9		5	7		7									
Marshall Road Drain near River Road	5	8	5	2	4		1								4			
Mud Slough Upstream of San Luis Drain	1	1	7	2		1	9		8						1			
Newman Wasteway near Hills Ferry Road	6		6	5			5											
Orestimba Creek at Farm Bridge	2	2		1														
Poso Slough at Indiana Ave	3		2	4	2								2		1		1	
Ramona Lake near Fig Avenue	1	2	2		1		2								1			
Salt Slough @ Lander Avenue	1		8	3			2		1								1	
Salt Slough at Sand Dam	1	1													1		1	
San Joaquin River at Lander Avenue	1	2	6	3		3			6								1	
Westley Wasteway near Cox Road	7	11	6	7	5		2								3			
Grand Total	**76**	**85**	**79**	**63**	**12**	**13**	**43**		**27**	**2**	**1**	**1**	**2**	**1**	**25**	**1**	**4**	**4**

*Water column *H. azteca* toxicity are addressed as part of the management plans for pyrethroids; there are no separate management plans for *H. azteca* toxicity.

STATUS OF TMDLS

The Coalition evaluates compliance with US EPA-approved TMDL discharge limitations based on TMDL monitoring and reporting requirements specified in the WDR and the Fifth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento-San Joaquin River Basins (hereafter, Basin Plan; Revised May 2018).

Approved TMDLs in the Coalition region include chlorpyrifos and diazinon, pyrethroids, salt (electrical conductivity), and boron.

Chlorpyrifos and Diazinon TMDL

On March 11, 2021, the ESJWQC and WSJRWC requested to the Regional Water Board to reduce the monitoring and reporting for the chlorpyrifos and diazinon TMDL due to the current ban on chlorpyrifos applications and the improved water quality with respect to diazinon. The Regional Water Board approved the request to discontinue chlorpyrifos monitoring at the TMDL river and tributary sites and to target diazinon monitoring at the TMDL sites per the PEP selection (approved May 7, 2021). The Regional Water Board also approved the request to submit a reduced TMDL Annual Report; the ESJWQC and WSJRWC are providing a reduced San Joaquin River Chlorpyrifos and Diazinon 2022 WY TMDL AMR as an Appendix to this report (Appendix IV).

Pyrethroid Basin Plan Amendment

The Pyrethroid BPA includes monitoring requirements for agricultural operations potentially discharging any of six pyrethroids: bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin, and permethrin. The Coalition monitors for all six pyrethroids based on the PEP results. The Coalition also collects samples for organic carbon (TOC and DOC) and water column toxicity to *H. azteca* whenever pyrethroid chemistry sampling is required.

Del Puerto Creek, Hospital Creek, and Ingram Creek are on the 303(d) list as impaired waterbodies for pyrethroids with the source of agriculture. The Coalition's Pesticides and Toxicity SQMP was amended on June 20, 2019 (approved April 7, 2020) to include a Management Plan Strategy for pyrethroid impairments in the Del Puerto Creek, Hospital Creek, and Ingram Creek watersheds. During the 2022 Monitoring Period, the Coalition continued monitoring for pyrethroids, *H. azteca* water column toxicity and organic carbon at Del Puerto Creek, Hospital Creek, and Ingram Creek.

Salt and Boron TMDL

The goal of the Salt and Boron TMDL is to manage salt and boron concentrations to achieve WQOs in the LSJR. In 2006, CV-SALTS was formed to guide the implementation of a salinity and nitrate control program, which led to the adoption of the SNMP in 2017 and amendments to the

Basin Plan in 2020. The Coalition recognizes that water quality impairments from salt are a Central Valley-wide concern. Coalition representatives attend CV-SALTS meetings, participate in planning and reviewing studies relevant to the development of a SNMP for surface and groundwater, and contribute financially to support the CV Salinity Coalition. In addition, the Coalition monitors for salt (SC), nutrients (nitrate) and boron (as determined by the PEP) and includes these constituents in discussions with members about water quality impairments and applicable management practices.

EVALUATION OF MANAGEMENT PRACTICE EFFECTIVENESS

From 2018 through the 2022 Monitoring Period, the Coalition carried out the SQMP process and Focused Outreach efforts. These efforts involved evaluating monitoring results collected from watersheds where Focused Outreach occurred to assess the efficacy of management practices in preventing the offsite movement of agricultural constituents and reducing water quality impairments due to agriculture.

The following evaluation determines if Beneficial Uses (BUs) are protected, how pesticide applications and monitoring results have changed over time ('Trends in Coalition Monitoring Data' section), and what management practices in the Coalition region improved water quality ('Efficacy of Implemented Management Practices' section).

PROTECTING BENEFICIAL USES

To address if receiving waters to which irrigated lands discharge are meeting applicable WQOs and Basin Plan provisions, the Coalition analyzed the 2022 Monitoring Periods data to determine if BUs are protected. As outlined in the Basin Plan and WDR, waters of the State receiving discharge from irrigated lands must be protective of all BUs including Agricultural Supply (AG), Aquatic Life (AQ; including cold freshwater habitat spawning, warm freshwater habitat, and freshwater habitat), Water Contact Recreation (REC 1), and Municipal and Domestic Supply (MUN or Municipal).

In 2008, the Regional Water Board developed a list of WQTLs based on numeric WQOs and standards from the Basin Plan including interpretive narrative WQOs (Table 31). The WQTL list is used to determine exceedances and if BUs are impaired. The Coalition assigned BUs to WSJRWC monitoring sites based on the BU assigned to the immediate downstream waterbodies in the Basin Plan (tributary rule). The immediate downstream waterbody for the Coalition monitoring sites is the Sacramento/San Joaquin Delta. The tributary rule does not apply to constructed agricultural drains. Exceedances of constituent specific WQTLs that cause impairments to AG, AQ Life, and MUN BUs can have multiple sources that may or may not result from agricultural practices.

Waters of the State and BUs are considered protected if no exceedances of WQTLs occur during monitoring events. If constituents were detected above their respective WQTLs during the 2022 Monitoring Period, they are listed in Table 73 with assigned BUs. Table 74 lists each site monitored, the immediate downstream waterbody, and indicates if the BU was protected during the monitoring year. Not all constituents monitored by the Coalition have a WQTL associated with a BU. Therefore, only constituents with WQTLs associated with BU impairments are included in the protection assessment.

AQ Life BU

During the 2022 Monitoring Period, there were 113 exceedances of the WQTLs for DO (76), ammonia (12), methomyl (1), and pyrethroids (24). These exceedances led to impairment of the AQ Life BU (Table 73 and Figure 3Figure 4. Percentages of exceedances of WQTLs for copper (2006) and pesticides (2004) through the 2022 Monitoring Period.). A total of 18 sites were monitored for constituents that could impair the AQ Life BU. Water quality results indicate one site was protective of the AQ Life BU (0.6%; Table 74).

AG BU

In the 2022 Monitoring Period, there were 135 exceedances of the WQTLs for SC (81), boron (44), and molybdenum (10) resulting in impairments to the AG BU for the Sacramento/San Joaquin Delta (Table 73 and Figure 3). A total of 18 sites were monitored for constituents that could impair the AG BU. Water quality results indicate that three sites were protective of the AG BU (17%; Table 74).

MUN BU

In the 2022 Monitoring Period, there were 30 exceedances of the WQTLs for ammonia (12), arsenic (14), DDE (1), DDT (1), and diuron (2) resulting in impairments to the MUN BU for the Sacramento/San Joaquin Delta (Table 73 and Figure 3). A total of 18 sites were monitored for constituents that could impair the MUN BU. Water quality results indicate that eight sites were protective of the MUN BU (44%; Table 74).

REC 1 BU

In the 2022 Monitoring Period, there were 64 exceedances of the WQTLs for *E. coli* (64), resulting in impairments to the REC 1 BU for the Sacramento/San Joaquin Delta (Table 73 and Figure 3). Among the 18 sites monitored for *E. coli*, water quality results indicate two sites were protective of the REC 1 BU (11%; Table 74). *E. coli* is the only constituent monitored by the Coalition that has a WQTL protective of recreation, therefore *E. coli* is not included in Figure 3.

As depicted in Table 74 water quality is still not completely protective of all BUs across the Coalition region, in large part due to exceedances of the WQTLs for field parameters and *E. coli*. As described in the 'Surface Water Monitoring Results' section, the Coalition is working with members through various outreach initiatives to address the recent pyrethroid exceedances.

Table 73. Exceedances of WQTLs and number of times BUs were impaired during the 2022 Monitoring Year.

Beneficial Use	DO	SC	E. coli	Ammonia	Arsenic	Boron	DDE	DDT	Diuron	Methomyl	Molybdenum	Pyrethroids	Total
AQ Life	76			12						1		24	113
AG		81				44					10		135
MUN				12	14		1	1	2				30
REC 1			64										64

AQ Life-Aquatic Life (includes cold freshwater habitat spawning, warm freshwater habitat, and freshwater habitat)
AG-Agricultural
MUN-Municipal and Domestic Supply
REC 1-Water Contact Recreation

Figure 3. Percentages of impairments of BUs due to exceedances of WQOs during the 2022 Monitoring Year.

Aquatic Life includes all categories (cold freshwater habitat spawning, warm freshwater habitat, and freshwater habitat). Recreational is not included as it is always 100% E. coli exceedances.

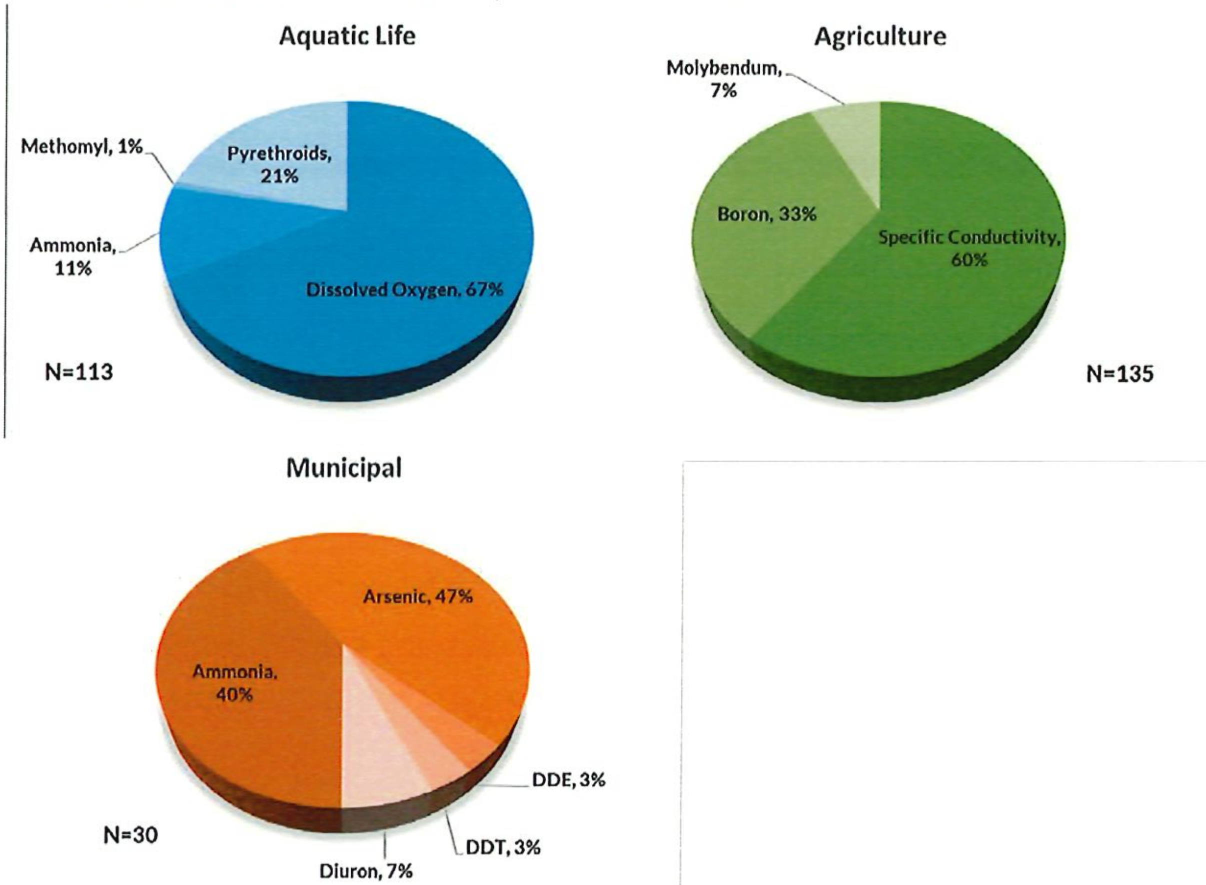


Table 74. Evaluation of beneficial uses for 2018 through 2022 Monitoring Periods.

'X' indicates no sampling occurred during that year. "Yes" indicates that the site was protected (no exceedances) and "No" indicates the site was not protected (exceedances).

Monitoring Site (Years of Focused Outreach)	Immediate Downstream Waterbody	Beneficial Use Immediate Downstream Waterbody	Status 2018 Monitoring Year Meets BUs?	Status 2019 Monitoring Year Meets BUs?	Status 2021 Monitoring Year Meets BUs?	Status 2022 Monitoring Year Meets BUs?
Blewett Drain near Highway 132 (2021-2023)	Sacramento/San Joaquin Delta	MUN	Yes	No	No	Yes
		AG	Yes	Yes	No	Yes
		REC 1	No	No	No	No
		AQ Life	No	Yes	No	No
Dek Puerto Creek @ Highway 33 (2022-2024)	Sacramento/San Joaquin Delta	MUN	Yes	Yes	Yes	Yes
		AG	Yes	No	No	No
		REC 1	Yes	No	No	No
		AQ Life	Yes	No	No	No
Del Puerto Creek near Cox Rd (2022-2024)	Sacramento/San Joaquin Delta	MUN	No	No	Yes	Yes
		AG	Yes	Yes	No	No
		REC 1	No	No	No	No
		AQ Life	Yes	No	No	No
Hospital Creek @ River Rd (2022-2024)	Sacramento/San Joaquin Delta	MUN	No	Yes	No	Yes
		AG	No	Yes	No	No
		REC 1	No	No	No	No
		AQ Life	No	Yes	No	No
Ingram Creek @ River Rd	Sacramento/San Joaquin Delta	MUN	No	No	No	No
		AG	No	No	No	No
		REC 1	No	No	No	No
		AQ Life	No	Yes	No	No
Los Banos Creek @ China Camp Rd (2008-2010)	Sacramento/San Joaquin Delta	MUN	Yes	No	No	No
		AG	No	No	No	No
		REC 1	No	No	No	No
		AQ Life	Yes	Yes	No	No
Los Banos Creek @ Highway 140 (2016-2018)	Sacramento/San Joaquin Delta	MUN	No	No	No	No
		AG	No	No	No	No
		REC 1	No	No	No	No
		AQ Life	Yes	Yes	No	No
Marshall Rd Drain near River Rd (2010-2012; 2022-2024)	Sacramento/San Joaquin Delta	MUN	Yes	No	No	No
		AG	Yes	Yes	No	No
		REC 1	No	No	No	No
		AQ Life	No	No	No	No
Mud Slough Upstream of San Luis Drain	Sacramento/San Joaquin Delta	MUN	No	No	No	No

Monitoring Site (Years of Focused Outreach)	Immediate Downstream Waterbody	Beneficial Use Immediate Downstream Waterbody	Status 2018 Monitoring Year Meets BUs?	Status 2019 Monitoring Year Meets BUs?	Status 2021 Monitoring Year meets BUs?	Status 2022 Monitoring Year meets BUs?
(2008-2010; 2021-2023)		AG	No	No	No	No
		REC 1	No	No	No	No
		AQ Life	No	Yes	No	No
Newman Wasteway near Hills Ferry Rd (2017-2019)	Sacramento/San Joaquin Delta	MUN	Yes	Yes	No	Yes
		AG	No	No	No	No
		REC 1	No	No	No	No
		AQ Life	Yes	Yes	No	No
Orestimba Creek @ Farm Bridge[1] (2008-2010)	Sacramento/San Joaquin Delta	MUN	No	Yes	Yes	Yes
		AG	Yes	Yes	Yes	Yes
		REC 1	No	No	No	No
		AQ Life	Yes	No	Yes	No
Poso Slough @ Indiana Ave (2014-2016)	Sacramento/San Joaquin Delta	MUN	Yes	Yes	No	No
		AG	Yes	Yes	No	No
		REC 1	Yes	Yes	No	No
		AQ Life	Yes	Yes	No	No
Ramona Lake near Fig Ave (2018-2020)	Sacramento/San Joaquin Delta	MUN	Yes	No	No	No
		AG	No	No	No	No
		REC 1	Yes	Yes	Yes	Yes
		AQ Life	Yes	No	No	No
Salt Slough @ Lander Ave (2019-2121)	Sacramento/San Joaquin Delta	MUN	No	Yes	No	Yes
		AG	No	No	No	No
		REC 1	No	No	No	No
		AQ Life	Yes	Yes	No	No
Salt Slough @ Sand Dam (2018-2020)	Sacramento/San Joaquin Delta	MUN	Yes	Yes	Yes	Yes
		AG	No	No	No	Yes
		REC 1	No	Yes	No	Yes
		AQ Life	No	Yes	No	No
San Joaquin River @ Lander Ave (2011-2013)	Sacramento/San Joaquin Delta	MUN	Yes	Yes	Yes	No
		AG	Yes	Yes	Yes	No
		REC 1	No	No	No	No

Monitoring Site (Years of Focused Outreach)	Immediate Downstream Waterbody	Beneficial Use Immediate Downstream Waterbody	Status 2018 Monitoring Year Meets BUs?	Status 2019 Monitoring Year Meets BUs?	Status 2021 Monitoring Year meets BUs?	Status 2022 Monitoring Year meets BUs?
		AQ Life	Yes	Yes	Yes	No
Westly Wasteway near Cox Rd (2019-2121)	Sacramento/San Joaquin Delta	MUN	Yes	No	No	No
		AG	Yes	No	No	No
		REC 1	No	No	No	No
		AQ Life	Yes	No	No	No

[1]Orestimba Creek @ Farm Bridge includes closed sites Orestimba Creek @ Eastin and Orestimba Creek @ Hwy 33.
[2]The Coalition inadvertently monitored Santa Fe Canal at Gun Club Road as an incorrect alternative site during the November and December rain events, as well as regular monitoring during January 2023.

TRENDS IN COALITION MONITORING DATA

To determine if water quality conditions are changing over time, the Coalition evaluated monitoring results to identify potential temporal and spatial trends.

Data from 2018 represents water quality in the Coalition region at the beginning of Focused Outreach when growers began implementing additional management practices designed to improve water quality. The 2022 Monitoring Period data reflect water quality results after five years of Focused Outreach at different watersheds within the region. The Coalition analyzes these data for two types of trends, 1) temporal trends (consistent water quality impairments across time, i.e., same months and/or seasons), and 2) spatial trends (consistent water quality impairments in a specific area). However, a robust analysis of qualitative temporal and spatial trends is difficult after just five years of Focused Outreach.

Temporal Trends

The temporal trend analysis (2018 through 2022 Monitoring Period results) assesses if exceedances occur less (or more) frequently since the initiation of Focused Outreach. For the trend analysis, the Coalition analyzes monitoring data for the two primary groups of constituents applied by agriculture: metals (boron, copper, and zinc) and pesticides.

Applied Metals: 2018 – 2022 Monitoring Period

Metals applied by agriculture in the Coalition region include copper and zinc. Table 75 includes applied metals detected above the hardness based WQTL in the Coalition region. Figure 4 includes the percentage of exceedances that occurred from 2006 through the 2022 Monitoring Period. The percentage of exceedances was 10.8% in 2006 and has decreased to 0% in 2022. The percentage of metal exceedances has been less than 1% since 2009 except for 2018 (1.1%). Since Focused Outreach began in 2018, four sites with copper management plans have been approved for management plan completion.

In addition to applied metals, there are three metals impairing water quality in the Coalition area: arsenic, boron, and selenium. All three trace metals are naturally occurring in the Coalition region. On January 22, 2018, the Coalition submitted a Source Identification Study Work Plan for arsenic, boron, and selenium, as outlined in the Comprehensive SQMP, to demonstrate that the presence and the concentration of numerous constituents, primarily non-metals, transition metals, and metalloids, is a result of the underlying geology, not discharge from agricultural fields. Currently, there are three active management plans for applied metals and four completed management plans for copper.

Pesticides: 2018 – 2022 Monitoring Period

In 2018, the Coalition evaluated the need to monitor pesticides using the Regional Water Board's PEP, which assesses the potential for monitoring based on factors such as pesticide use, environmental fate, and monitoring history. In addition, the Coalition monitored for the following legacy pesticides that are no longer applied due to previous exceedances: DDD, DDE, and DDT. In the 2022 Monitoring Period, the Coalition monitored 34 pesticides (including carbamates, dinitroaniline, organophosphate, neonicotinoid, pyrethroids, and legacy pesticides). However, trigger limits have not been established for many of these pesticides by the Regional Water Board.

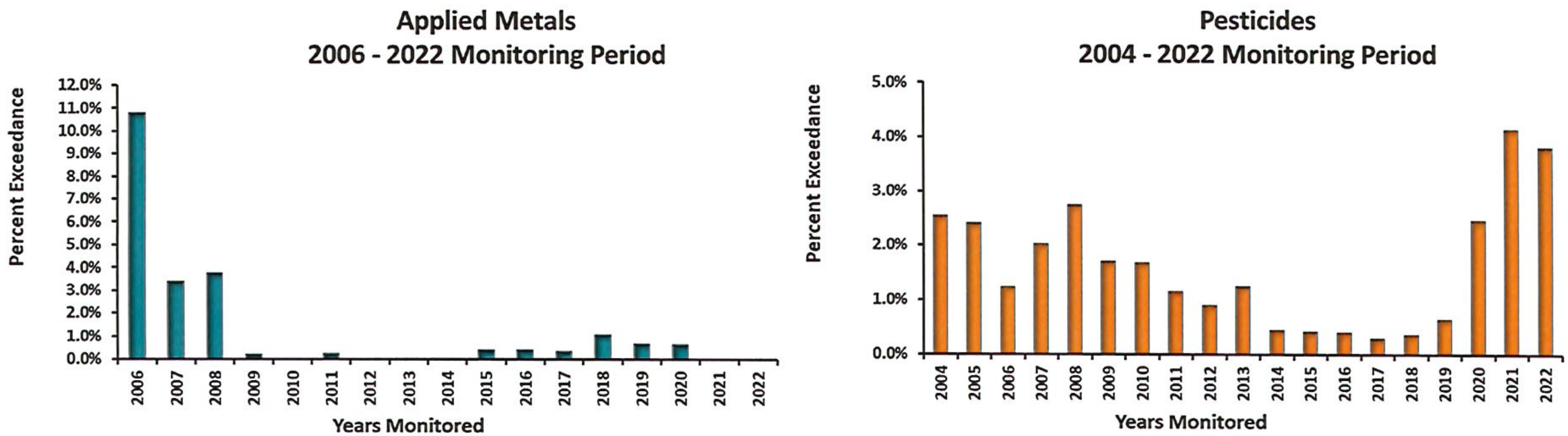
The Coalition began monitoring pesticides in 2004 and implemented Focused Plans in 2008. Additionally, Focused Outreach was initiated in 2018 with the revised Comprehensive SQMP (Figure 4 and Table 75). Since the implementation of these actions, there has been steady improvements in water quality, particularly in relation to exceedances of the WQTLs for pesticides. Nevertheless, changes to the pyrethroid WQTL in March 2019, have yielded a marked increase in exceedances of the pyrethroid chronic additive CGU. In the 2022 Monitoring Period, there were a total of 31 exceedances of the WQTLs for pesticides, with 26 from pyrethroids. Consequently, the Coalition has directed its Focused Outreach to watersheds with water quality impairments caused by pyrethroids.

Table 75. Percentages of exceedances of WQTLs for applied metals (2006) and pesticides (2004) through the 2022 Monitoring Period.

Years	Applied Metals (Copper and Zinc)			Pesticides		
	Total Exceedances	Total Samples	Percent Exceedances	Total Exceedances	Total Sampled	Percent Exceedances
2004	NA	NA	NA	17	668	2.5%
2005	NA	NA	NA	32	1329	2.4%
2006	19	176	10.8%	30	2438	1.2%
2007	11	322	3.4%	70	3454	2.0%
2008	13	346	3.8%	140	5117	2.7%
2009	1	449	0.2%	94	5535	1.7%
2010	0	196	0.0%	104	6186	1.7%
2011	2	856	0.2%	101	8784	1.1%
2012	0	472	0.0%	54	6027	0.9%
2013	0	408	0.0%	66	5256	1.3%
2014	0	832	0.0%	36	8127	0.4%
2015	2	478	0.4%	22	5172	0.4%
2016	2	470	0.4%	21	5114	0.4%
2017	2	556	0.4%	19	6375	0.3%
2018	2	184	1.1%	8	2208	0.4%
2019	1	147	0.7%	8	1258	0.6%
2020	2	304	0.7%	26	1058	2.5%
2021	0	173	0.0%	39	941	4.1%
2022	0	135	0.0%	30	787	3.8%

Figure 4. Percentages of exceedances of WQTLs for copper (2006) and pesticides (2004) through the 2022 Monitoring Period.

The bar graph includes percentages of exceedances of constituents grouped as 'pesticides' or 'applied metals.'



Spatial Trends

The Coalition will look into reviewing monitoring data to identify any spatial trends in water quality impairments in a specific geographical region in the future. The Coalition will look to associate an observable relationship between exceedances and any geographical region.

EFFICACY OF IMPLEMENTED MANAGEMENT PRACTICES

To determine if implemented management practices are effective in meeting applicable receiving water limitations, the Coalition evaluated management practices implemented by members in association with changes in water quality over time. In evaluating water quality since Focused Outreach was initiated in 2018, improvements occurred after new management practices were implemented.

Another primary indicator of management practice effectiveness is the that the Coalition continues to be approved for the completion of management plans. The Coalition has received approval for the completion of 68 management plans since Focused Outreach began in 2018.

on-conserved or naturally occurring constituents in the environment (field parameters, salts, and some metals) are difficult to manage with agricultural management practices alone.

MITIGATION MONITORING REPORT

As stated on Page 10 of the WDR, environmental impacts may occur because of member compliance activities. Members must either avoid impacts where feasible or implement identified mitigation measures, if any, to reduce potential impacts. If not feasible, use of the WDR is prohibited and individual WDRs are required. Any California Environmental Quality Act (CEQA) mitigation measures implemented and reported by WSJRWC members (including the impact measures addressed, location (TRS), and monitoring scheduled to measure the success of mitigation) would be reported June 30 annually (MRP Order; Attachment B).

There were no implemented mitigation measures reported by Coalition members during the 2022 Monitoring Period.

CONCLUSIONS

Monitoring results from the 2022 Monitoring Period indicate that water quality is improving; however, several waterbodies in the Coalition region remain non-protective of all BUs.

Overall, water quality in the Coalition region is improving. The management practices implemented by growers have been effective in reducing water quality impairments, as indicated by the completion of 68 management plans since the initiation of Focused Outreach. In the 2024 Annual Report, the Coalition will include an update on the constituents approved for management plan completion in 2023 (requesting to complete 52 management plans due to water quality improvements).

The most common BU impairments involved constituents for which irrigated agriculture may not be the primary contributor, such as field parameters and *E. coli* which are non-conserved and sources are difficult to track. Managing constituents that are non-conserved or naturally occurring in the environment (field parameters, salts, and some metals) is beyond the scope of what the Coalition can achieve through management practice implementation alone.

There have been 79 exceedances of the pyrethroid chronic additive CGU since the Pyrethroid Control Program was implemented at the start of the 2019 Monitoring Period, triggering twelve management plans. In 2023, the Coalition will conduct Focused Outreach in three watersheds focusing on pyrethroid exceedances.

RECOMMENDATIONS

The Coalition identified several areas in which CVRWQCB involvement could result in improved water quality in the Coalition region:

- Continue enforcement actions against non-members who have the potential to discharge.
- Move forward with the processes to develop plans to study contamination of surface waters by *E. coli*, causes of elevated pH, and low DO.
- Continue to work with the CV-SALTS process to develop a better understanding of the sources and sinks of salt in surface and groundwater and potential practices that can be effective in preventing exceedances.

REFERENCES

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Westside San Joaquin River Watershed Coalition. http://www.westsidesjr.org

Environmental Protection Agency. (2012). Retrieved March 20, 2015. Beef Production: http://www.epa.gov/agriculture/ag101/printbeef.html#bmanure

Attachment H

Samples of provided materials and notices

https://slcc.net/about-slcc/

Home ▾ About SLCC ▾ Board Meeting Agendas ▾ Contact Information ▾ Resource Center ▾ hmrd.net ▾ Shareholder Portal

Water Conservation Information

Documentation

- On-FARM CONSERVATION PROJECT APPLICATION
- ON FARM CONSERVATION PROGRAM
- DRIP IRRIGATION SYSTEMS RECOMMENDATIONS
- CIMIS WEBSITE LINK
- ADVANCED PUMPING EFFICIENCY PROGRAM
- CONTACT INFORMATION
- Summer Irrigation Evaluation Program

Summer Irrigation Evaluation Program Flyer

INVITATION TO PARTICIPATE
First come, first served!

Summer Irrigation Evaluation Program

Drip/Micro Irrigation Systems

Ongoing Evaluations throughout the Central Valley in Summer 2024

Funded by the California Dept. of Water Resources (DWR)
Supported by local irrigation/water districts

What does the student team do?

- Spends about one day in the field taking measurements of pressures and flows, and making observations of the filtration, chemical injection, etc.
- Inputs data into the Cal Poly ITRC Irrigation Evaluation Programs and examines field data
- Prints out the data, results, and recommendations
- Sets up an appointment with the farmer to review the information

What information is provided afterward?

The ITRC Irrigation Evaluation Program results tell you:

- The Distribution Uniformity (DU) of the irrigation system; the DU is a measure of how evenly the irrigation water is applied to plants throughout a field
- The causes of non-uniformity; for example, the program will tell a farmer what percentage of the non-uniformity is due to plugging, what percentage is due to pressure differences, etc.
- Recommendations on how to improve that specific system's performance

Who gets the information?

- The farmer
- The water/irrigation district (if applicable)
- The DWR (but without any farmer's name or address)
- Cal Poly ITRC (we have a database of results without contact information)

What is the farmer's obligation?

- There is no fee; it is completely funded by the CA DWR.
- The farmer must agree to have someone show the students the field, explain the layout, and start and stop the pump on the agreed-upon date and at the agreed-upon time. It is VERY helpful to provide a map of the irrigation system.
- The farmer must be willing to take the time to sit down and go over the results (about 30 minutes).

Why should I participate?

Irrigation systems cost money to operate, and their performance greatly impacts yield and yield quality. Older systems need to be checked out just as automobiles do. Sometimes they need a tune-up; sometimes they don't. This evaluation lets a farmer know if a tune-up is needed, and what types of things can be done.

On average, we find that the DU of drip/micro systems is about 0.76 (out of a perfect 1.00), whereas reasonably attainable values are about 0.92 for drip/micro systems. If you shift from a DU of 0.76 to a DU of about 0.92, the ratio of (maximum/minimum) water applied to different plants throughout a field will shift from about 2 to 1 to about 1.2 to 1.

Farmers should expect a high DU from a new irrigation system. This program allows farmers to verify the quality of a new system that might have been recently purchased.

Contact

Dr. GW Bates, P.E., Project Manager
Irrigation Training & Research Center
California Polytechnic State University
San Luis Obispo, California 93407
(805) 756-6139
gwbates@calpoly.edu
www.itrc.org

LEARN BY DOING
CAL POLY
Irrigation Training & Research Center

4/29/24

Advanced Pumping Efficiency Program

Pump Testing

A pump efficiency test measures various aspects of the pump's operation including:

- Water flow rate
- Pumping lift (or inlet pressure)
- Pump discharge pressure
- Energy input to the pumping plant

The overall pumping efficiency is determined by comparing the energy input to the pump versus the "water horsepower" developed by the pump. The water horsepower is related to the pump flow and total dynamic head (pumping lift and discharge pressure) in the system.

Regular pump testing provides important information in order to:

- Identify problems before a breakdown occurs
- Perform an objective economic analysis about retrofitting and repairing
- Establish a baseline of performance on new pumps

How to get a pump test explains the process of obtaining a test from the list of participating pump testers.

More information is available in the APEP brochure "Pump Efficiency Tests ."

ADVANCED PUMPING EFFICIENCY PROGRAM
5370 N Chestnut Ave. MS OF 18
Fresno, CA 93710
P 559.278.6038

Irrigated Lands Regulatory Program (ILRP)

San Luis Canal Company is a member of the Westside Coalition. Please call or email Alejandro for more information.

ILRP Relevant Informaiton

- Nitrogen Management Plan Form and Instructions
- Waste Discharge Requirements: General Order
- Westside Coalition: New Farm Evaluation (FEP)
- Westside Coalition: Notice of Confirmation (NOC) Signup
- Amount of Nitrogen In Irrigation Water - Conversions
- Irrigated Lands Program Letters

Current Reservoir Conditions

Current Conditions

You're Invited to:

Annual Meeting of the Westside San Joaquin River Watershed Coalition to Review Requirements under the Irrigated Lands Regulatory Program

Each Meeting Will Cover:

- Update on Spring 2023 Reporting of the Nitrogen Summary, 2024 Nitrogen Plan, and 2025 Farm Plan
- Update on Coalition Activities
- Overview of Required Focused Outreach to Growers
- Regulatory Changes to Nitrogen Applications
- Update on Management Zone Implementation
- Questions and Answers

For More Information Contact:
Frederik Fourie
(559) 582-9237
No RSVP is Required

Please Bring This Card With You As Verification Of Your Attendance - If You Represent More Than One Farm, Bring Those Cards As Well!

Attendance at any one of the meetings satisfies the requirement to attend at least 1 Coalition meeting per year

These meetings are for agricultural members and their designated Agents

Los Banos, CA
Tuesday, January 30, 2024
9:30 am - 11:30 am
Los Banos Community Center
Grand Ballroom
645 7th St., Los Banos

Newman, CA
Tuesday, February 13, 2024
9:30 am - 11:30 am
Newman Memorial Building
649 Orestimba Rd., Newman

Westley, CA
Tuesday, February 27, 2024
9:30 am - 11:30 am
Westley Fire Station #3
8598 Kern St., Westley

Subbasin Announcements

The Delta-Mendota Subbasin continues with groundwater sustainability plan (GSP) implementation despite the GSPs being deemed "Inadequate" by the California Department of Water Resources (DWR). During the second quarter of 2023, the Subbasin completed spring water level monitoring and submitted the Water Year 2022 Annual Report.

State Water Resources Control Board (SWRCB) Staff Releases Draft Schedule for Inadequate Subbasin Probationary Hearings

Six Subbasins in the San Joaquin Valley with GSPs determined to be inadequate by DWR must now work through SWRCB to achieve "approved" status, per SGMA. SWRCB staff released a draft schedule for holding probationary hearings for all, including the Delta-Mendota Subbasin. Per the draft schedule, the Subbasin probationary hearing is tentatively scheduled for September, 2024. GSAs in the Subbasin may be able to avoid a probationary hearing by submitting revised GSPs prior to SWRCB issuing additional draft deficiencies, expected next spring.

Responding to DWR's Inadequate Determination for Subbasin GSPs

Delta-Mendota Subbasin GSAs have agreed to pursue a single GSP for the Subbasin as a way to achieve "approved" status. A consultant was retained to address the Subbasin's water budget and Sustainable Management Criteria (SMCs) in the first step toward addressing "deficiencies" identified by DWR in the six GSPs that now cover the Subbasin.

The Coordination Committee released a request for Proposals (RFP) to hire a consultant to complete the task of condensing those GSP's into one document. The response to that RFP was still under review as the quarter came to a close.

SGMA Grant Activities

Work continues on the SGMA Round 1 Implementation Grant, funded through DWR. Grant funds will reimburse GSAs for a variety of projects and activities dating back to December of 2021, when the grant proposal was submitted.

In addition to larger projects, the Subbasin will use the funding to conduct monitoring and fill data gaps to help water managers sustainably manage the Subbasin's precious groundwater resources for all beneficial uses and users.

Water Quality Monitoring

GSAs are in the process of collecting water quality monitoring data. Data will be submitted to DWR as required by SGMA in the fall.

Upcoming Meetings and Important Dates

Coordination Committee
Second/Fourth Mondays
1:00 PM SLDMWA Boardroom

Northern Management Committee
First Wednesday
2:00 PM Patterson City Hall

Central Management Committee
Fourth Thursdays
10:00 AM SLDMWA Boardroom

Questions? Contact your local groundwater sustainability agency or send an email to dmsgma@sldmwa.org

Visit deltamendota.org for current and upcoming meeting information

The 2023 Second Quarter Newsletter can be accessed online at http://deltamendota.org/wp-content/uploads/2023/07/DM-Newsletter-2023-Q2-A.pdf

The San Luis Canal Company - A | SJRECWA Newsletters | Exchange

Not secure | www.sjrecwa.net/newsletters/

Newsletters

Home | Newsletters

SJRECWA NEWSLETTERS

NEWS/EVENTS

Newsletter of the San Joaquin River Exchange Contractors Water Authority

2023

Q3 NEWSLETTER

Q1 NEWSLETTER

Attachment I

On-Farm Water Conservation Policy

San Luis Canal Company

Water Conservation Policy

Adopted: October 10, 2002
Revised: November 14, 2004
Revised: January 26, 2006
Revised: December 21, 2006
Revised: September 27, 2007
Revised: December 17, 2009
Revised: May 24, 2012
Revised: November 22, 2016
Revised: February 25, 2021

PREFACE

This policy is all about water. Water is why the San Luis Canal Company exists. Access to water is the reason why the Company was formed. The effective and efficient delivery and use of water is vital to the continued viability of this Company and its stockholders.

The policy contained in this document is the result of many hours of work and effort by the directors and management of the San Luis Canal Company. It is intended to provide incentive for the growers on lands serviced by the Company to make effective and efficient use of the water available to them. It is also recognized that this document will necessarily change over time.

Unforeseen factors may affect the achievement of the goals and objectives of this policy. As time passes, new technologies will become available, politicians will create laws and the regulatory authorities will promulgate guidelines, rules and regulations for managing water supplies and drainage. Future efforts will be required to keep this policy "alive" through modification and revision so that it will continue to provide incentive for change and a vehicle to achieve the desired results.

In 2002 the directors saw fit to identify those goals which should be fostered by this policy and proceeded to develop a mission statement. Those who take advantage of the opportunities presented by this policy would do well to evaluate potential water conservation measures by this mission statement.

MISSION STATEMENT

To protect our most precious resource and to recognize the inherent economic benefits to be accrued to all of the stockholders of the San Luis Canal Company, the Board of Directors has established a water conservation policy. The mission of the Conservation Policy is sixfold. Specifically, the San Luis Canal Company has implemented a Conservation Policy in order to:

1. Protect our water rights
2. Provide for the measurable conservation of water
3. Improve the access of land to efficient and effective irrigation
4. Improve the quality of land subject to irrigation
5. Improve the quality of water being discharged
6. Protect and enhance the environment

SCOPE

The following policy is available to stockholders and growers within the service area of the San Luis Canal Company. Growers who do not hold the stock on lands covered by projects proposed under this policy must obtain the written consent and participation of the appropriate stockholder/s.

GOALS AND OBJECTIVES

PROTECT OUR WATER RIGHTS

The San Luis Canal Company owns certain rights to water descending from appropriations made by the Company on water flowing in the San Joaquin River and any riparian rights which might have been acquired along the same river. The Company then entered into an agreement to exchange those rights under a contract with the United States Bureau of Reclamation which was entered into in 1939.

Additionally, the Company has the benefit of some very productive aquifers holding water of varying quality. The safe management and protection of this groundwater basin is the reason the San Luis Canal Company participated with the other exchange contractor entities to establish an AB3030 Groundwater Management Plan and then continued with the formation of the San Joaquin River Exchange Contractors Water Authority Groundwater Sustainability Agency as required under the State of California's new groundwater legislation entitled; Sustainable Groundwater Management Act

Together, those rights to water (both surface and ground) are the very foundation of the San Luis Canal Company. The protection and preservation of those rights are of paramount importance to the Company and are a fundamental reason that the directors implemented this water conservation policy.

PROVIDE FOR THE MEASURABLE CONSERVATION OF WATER

It is inherently understood that the transportation and application of water is an inefficient process with opportunities to become more efficient. It is the express intent of this policy that actions taken under it should provide for measurable amounts of conserved water which could include but would not be limited to the following:

- Reduced seepage
- Reduced evaporation
- Capture and Recapture of water
- Reduction in water applied

IMPROVE THE ACCESS OF LAND TO EFFICIENT AND EFFECTIVE IRRIGATION

Often agricultural land is developed along the historical sloughs and along the original grade of the land. This is not always the best setting for efficient irrigation. This pattern leads to meandering supply ditches and drains. It leads to fields with too much or too little fall. It leads to unsightly and inefficient shapes and protrusions. This policy recognizes that changing the shape and dynamics of the system leads to improvements in water conservation.

IMPROVE THE QUALITY OF LAND SUBJECT TO IRRIGATION

Lands within the San Luis Canal Company are subject to a number of different factors which can affect the quality of the land. Included among them are the surfacing of salts and the accumulation of water in the root zone. This policy is intended to address this impact with the added benefit of capturing some of the water which may be damaging the land.

IMPROVE THE QUALITY OF WATER BEING DISCHARGED

The regulatory environment in California is changing. The specter of Total Maximum Daily Loads for a variety of "contaminants" being allocated to water districts is facing us. Add this to the fact that our water supply is coming from the Sacramento/San Joaquin River Delta (thereby having a lower initial quality) and you have a recipe for limitations being imposed on drain water discharges. This policy recognizes the need to provide improvements on the system and on-farm which can improve the quality of water being discharged from our system.

PROTECT AND ENHANCE THE ENVIRONMENT

The Company exists in a world which is changing. Farmers have always been deemed to be conservationists and they certainly are faced with additional demands to be "wildlife friendly." This policy will place greater emphasis on those projects which contain added benefits to environmental, habitat enhancement and soil conservation. So too will it provide recognition to projects which do not damage environmental benefits which already exist.

CONSERVATION COMMITTEE

The San Luis Canal Company may establish a committee to promote the provisions of this policy and to ensure the fair and equitable implementation of the provisions contained herein. Nothing in this policy shall be construed to allow the Conservation Committee to direct or to implement projects under this policy without first being approved and authorized by the full Board of Directors of the Company. The duties of the Conservation Committee shall include but not be limited to the following:

- Evaluate the technical aspects of proposals under this policy and make recommendations to the full board
- Ensure that the goals of this policy are the "guiding principles" for evaluating new projects
- Periodically review the policy and make recommendations to the full board for improvements and modifications
- Annually evaluate funding opportunities and constraints and make an annual budget proposal grant and loan amounts, along with a corresponding interest rate to the full board

COST PER ACRE LIMITATION

Proposals should be cost effective and should have a favorable cost benefit ratio. The Company will only participate up to $500/acre on any single project except where otherwise noted in the policy.

Consistent with the Mission Statement and Goals/Objectives stated in this Policy, the Board finds it in the best interest of the Company to extend On-Farm Water Conservation Program funding to land which has previously received funding. Starting in March of 2021, all parcels will be eligible for $500/AC. Parcels which have not received funds through the On-Farm Water Conservation Program will be eligible for an additional $500/acre grant, loan, or combination thereof for a total of $1,000/AC.

Applications will be accepted on a first-come, first-serve basis dependent on funding availability through the budget year. If the program runs out of funds for the year, any applications received subsequent to that will be first in line for the following budget year cycle.

The total amount of financial participation by SLCC, whether by grant, loan or a combination thereof, shall not under any circumstances exceed a total of $500/$1,000 per acre. Once the parcel has maximized the $500/$1,000 per acre threshold, applicants will be allowed to sign a new conservation loan application on the same parcel of land only under the following terms and conditions:

- The project application will not be eligible for grant money
- The project application will be eligible for loan money for an additional $500/acre at the same terms and conditions as stated in the policy
- In order to qualify for the additional $500/acre of loan money, all previous outstanding conservation loans on the project parcel(s) must be paid in full prior to committee or board approval of the new application.

POLICY ELEMENTS

1. All projects must be for the benefit of stockholder (water rights) ground.

2. Projects will be evaluated upon the cumulative benefit that they provide to the stockholders of the Company and will be evaluated by staff and subject to review by a qualified consultant. The more goals and objectives that a project fulfills, the higher it will be rated with respect to other projects. For example, a project which protects water rights, provides for the measurable conservation of water and improves the quality of water being discharged, will likely be weighted higher than a project which simply improves the access of land to efficient irrigation. Projects may include but are not limited to the following list:

On-farm conservation projects:

Grant: 50% Cost Share, with a maximum of $250/Acre benefitted (*)
Loan: 50% Cost Share, with a maximum of $250/Acre benefitted (*)
(*) For applications on ground that have not previously participated in the program, the maximums double.

Qualifying projects might include:

- Laser Leveling
- Drip and Micro-sprinkler Irrigation
- Sprinklers
- Pipelines & Siphons
- Concrete Liners
- Poly Liners
- Tailwater Return Systems

FUNDING SOURCES

The San Luis Canal Company will not assist applicants to find outside funding sources. The applicant bears responsibility to the Company to make known funding sources as may be available to him independently.

It is considered that other funding sources may include the USDA, the Farm Service Agency and Resource Conservation Districts. The Company may provide a grant as defined elsewhere in this policy which shall apply only after considering any outside grants available. The landowner may also be required to contribute funds for a project which might include cash, outside loans or loans from the Company.

CONSTRUCTION PAYMENTS

Once completed SLCC will review all final project invoices and will thereafter provide applicant with either the Company grant or the Company loan or, as appropriate, both. The payment(s) to the Contractor or Subcontractor shall be the sole responsibility of the applicant. The Company will not have a financial relationship with the Contractor or Subcontractor; it will deal solely with the applicant as it pertains to the appropriate grant and loan package after the project is deemed complete.

Applicant shall indemnify and hold San Luis Canal Company harmless from any and all claims asserted by any contractor or subcontractor with respect to any crosier or expenses incurred in the performance of the actual work of construction.

Once the project has been deemed complete, and upon review of final project invoices, SLCC will provide the following to the applicant:

(i) Company Grant
(ii) Company Loan

(i) COMPANY GRANTS

Grants may be provided to applicants based upon the project approval. As defined in the Policy Elements, those grants generally cover up to fifty percent of the cost per acre limitation.

Nothing in this policy guarantees that an applicant will receive a grant for the amounts identified above, rather the grant percentages are to be used as guideline limits for projects. For example, if an applicant proposes a project which would otherwise qualify for a grant of $80,000 but there is only

$63,000 left in the approved conservation budget, then a grant not to exceed $63,000 may be offered based upon a positive recommendation by the staff and board. A recommendation shall only be made based upon the evaluation of the project, its technical merits and any other factors which the staff and/or board shall determine to be appropriate.

(ii) COMPANY LOANS

Loans extended to stockholders and/or growers under this policy shall bear a simple interest rate. They shall have a term not exceed a term of 5 years and shall have annual repayment provisions with equal and ratable installments over the life of the loan. The interest rate for new project applications will be adjusted annually by the full board.

The Company retains the right to enforce the terms of the loan agreement by any means provided in the Company By-Laws, its rules and regulations, or under the laws of the state of California.

ADDITIONAL FACTORS TO BE CONSIDERED

There are many benefits that can accrue from a well designed and thought out project. Proposals are encouraged to consider as many benefits as can be effectively addressed in any given proposal. In light of this, additional factors shall likely be considered when evaluating a proposal. It is not known at this time what these factors are but it is expected that they will be identified in the application and evaluation process.

PROCESS

This section deals with the process of applying, evaluating, approving and constructing a project. Each applicant desiring to utilize this policy shall follow this process.

1. Each applicant shall obtain and complete an application at which time a project number will be assigned. The application must be submitted at least one month prior to the start of construction.
2. A Stockholder may submit an application on the behalf of a tenant. The Stockholder must approve the application and will be held responsible for annual project payments in the event their Tenant defaults on loan payment(s).
3. The applicant shall meet with Company staff to discuss the project and prepare a checklist for scoring.
4. The applicant shall work with staff to prepare a complete cost estimate.
5. The project shall be evaluated to determine if funding is currently available.
6. If funding is available, the project shall go before the board of directors for review and potential approval.
7. Those projects approved by the full board shall be sent back to staff for project management. Unless otherwise agreed to in writing, the Company shall have engineering specifications prepared with the cost of engineering work to be included in the project cost subject to grants, loans, etc.
8. The Company shall execute all necessary agreements with the applicant.
9. The project shall then be constructed. The Company or Company's agent shall provide construction oversight.

10. The completed project shall be reviewed by the applicant and by Company staff for acceptability of use. It must be understood that the completed project may or may not meet the applicant's initial expectations. However, neither the applicant nor the Company shall unreasonably deny acceptability so long as the completed project shall be functional in most major respects.
11. Final loan documents shall be prepared and executed.
12. A final construction report and file shall be prepared for retention by the Company.

SAN LUIS CANAL COMPANY
Water Conservation Project Application

Project #__________

Date:_______________

1. Stockholder's

   Name: ____

   Address: ____

2. Stock Certificate Number: __________________

3. Proposed Project:____

____

4. Project Location (Please attach a map to application):______________________________

____

5. Total Acres Involved:_____________________

6. Total Acres Owned in SLCC:________________

7. Total Acres Farmed in SLCC:________________

8. Estimated Project Cost:____________________

9. Anticipated Start of Construction:___________________

10. Are other landowners benefited by this project? YES___ NO___

    If Yes, then please list landowners receiving benefit
    a. __________________ c. ________________________
    b. __________________ d. ________________________

11. I am interested in SLCC **Grant** Program YES___ NO___

12. I am interested in SLCC **Loan** Program YES___ NO___

13. Will any other agency be participating in the funding of this project? YES_ NO___

    If Yes, Which agency?____________________________________ Amount: __________________

    Contact: ___________________________________ Phone: ____________________________

14. Comments: ____

____

15. Contact Person:____ Phone: ______________

    e-mail: ___________________________ Signature: ___________________________

    Signature:___________________________

Note: Reimbursement Payments will happen normally within one month of the submittal of all the project invoices. However, please note that in the event conservation funds are completely expended in the current year's budget, payments may be made in the following budget year.

Attachment J

Water Conservation Specialist Job Description and Qualifications

Water Conservation Specialist

General Description:

Assists landowners and farm operators within the district in water use planning and conservation practices.

Essential Job Functions:

- Performs resource inventories and evaluations, including use of Global Positioning Systems (GPS) equipment to collect spatial data, producing maps, surveying and assembling data needed for the evaluation, design and implementation of irrigation water conservation management practices.
- Develops and implements water quality and quantity monitoring programs, analyze and summarize data for presentations.
- Coordinates projects with local landowners.
- Develops water quality project grant proposals and projects as needed.
- Develops water management plans and provides technical assistance for clients and partners as assigned by the General Manager.
- Develops educational materials in the form of brochures, slide presentations, newsletters, etc.
- Provides landowners with technical assistance in planning agronomic and irrigation systems as well as implementing improved water management practices.
    - Conducting field work using basic surveying equipment.
    - Computing and plotting engineering notes
    - Preparing field sketches and drawings
    - Creating, modifying or adjusting standard designs
    - Preparing permit applications
    - Helping to secure funding where applicable.

- Direct link between the landowners and the District for implementation for its Water Conservation Program.
- Prepares reports on activities and accomplishments in a timely manner
- Continues to improve technical skills by attending training sessions and workshops.
- Represents HMRD on planning committees as directed
- Safely and properly uses and maintains district vehicles, office, laboratory and field equipment (e.g. pressure transducers, portable Doppler flow meters, etc).

Qualifications:

The position requires a Masters degree in Agriculture, with a specialization in Irrigation from an accredited institution plus 2 years experience in water management.

Must have both academic and practical field experience in performing irrigation evaluations, and on-farm irrigation efficiency calculations.

Must have a working knowledge of West U.S. irrigation districts, land use practices, and trends.

A qualified applicant must have knowledge of principles of water resources management, TMDL and other water quality issues, water resources monitoring, data management and analysis. The applicant should be able to demonstrate effective oral and written communication skills, including public speaking, report writing, and meeting facilitation.

Demonstrated experience and understanding of local agricultural practices, interpreting county codes, working with the public on water resources, agricultural, irrigation and drainage issues and addressing and solving water management problems.

Competency in the use of GIS, digital drawing software (AutoCAD LT, CanalCAD), Irrigation scheduling software (AgWater), surface mapping software (SURFER), and other computer applications, including Microsoft 365 applications.

Additional Job Requirements:

- Knowledge of a broad range of soil and water conservation principles, techniques, methods and practices to apply and install conservation systems.
- Ability to motivate individuals to adopt and implement resource management practices on their property. This may include educational speaking in front of public groups, organizations, or clubs.
- Bilingual in English and Spanish. Ability to work and communicate with diverse individuals in an effective, cooperative manner.
- Ability to expand into a variety of technical areas as water conservation techniques and practices continue to evolve.
- Ability to use computers to write reports, prepare plans, track work progress and record field and technical data.
- Ability to prioritize, plan and schedule work assignments and maintain accurate records regarding time-keeping
- Understanding of applicable local, state and federal environmental regulations, codes and policies as related to development and land use.

Must have experience in:

- Construction, installation, data collection, and maintenance of continuous flow rate measurement devices and data loggers.
- Methods and equipment of US Geological Survey standards for stream flow.

Attachment K

Board Resolution

SAN LUIS CANAL COMPANY

September 26, 2024

RESOLUTION #2024-804

A RESOLUTION APPROVING THE USBR "WATER MANAGEMENT PLAN" UPDATE

WHEREAS, the San Luis Canal Company (SLCC) prepared a "Water Management Plan" pursuant to the guidelines of the United States Department of the Interior Bureau of Reclamation (USBR) and the Board approved such plan on February 24, 2005; and

WHEREAS, the USBR, in accordance with the guidelines, requires that their Contractors re-evaluate and resubmit their plans every five years; and

WHEREAS, SLCC has prepared a "Water Management Plan Update" in accordance with the USBR's current criteria.

NOW, THEREFORE, BE IT RESOLVED that this Board of Directors has approved the "Water Management Plan Update" and directs that a copy of same, together with this resolution be forwarded to the USBR.

Duly approved this 26th day of September 2024, by vote of the Directors of San Luis Canal Company.

AYES: Director Michael, Director Pruitt, Director McDonald, Director Goodman, Director Palazzo, Director Gilardi and Director Grant
NOES:
ABSENT:
ABSTAIN:

William J. Gilardi Secretary