

RECLAMATION

Managing Water in the West

San Luis Canal Non-Project Water Pump-in Program Water Quality Monitoring Plan



U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
South-Central California Area Office

Revised: May 2022

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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List of Abbreviations and Acronyms

Check 13	San Luis Canal Milepost 66.74, O'Neill Forebay
Check 21	San Luis Canal Milepost 172.44, near Kettleman City
CVP	Central Valley Project
DWR	California Department of Water Resources
EC	Electrical conductivity, $\mu\text{S}/\text{cm}$
Lateral 7	Westlands Water District facility connected to the San Luis Canal at Milepost 115.43L
mg/L	milligrams per liter, equivalent to parts per million
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
San Luis Canal	The federal portion of the California Aqueduct
TDS	Total dissolved solids, mg/L
Title 22	California Drinking Water Standards
$\mu\text{g}/\text{L}$	micrograms per liter, equivalent to parts per billion
$\mu\text{S}/\text{cm}$	microSiemens per cm, salinity in water
Westlands/District	Westlands Water District

Definitions

Non-Project Water means surface or ground water:

- 1) Pumped, diverted, and/or stored based upon the exercise of water rights which have not been appropriated or acquired by, or apportioned to, the United States or others, or which have not been decreed, permitted, certificated, licensed, or otherwise granted to the United States or others, for a Reclamation project, or
- 2) Water not reserved or withdrawn from appropriation by the United States for, nor allocated by the United States to, a Reclamation project.

Excess Capacity means diversion, storage, conveyance, or pumping capacity in project facilities which is excess to that needed to achieve a Reclamation project's authorized purposes.

Max Depth to Groundwater (Max DTGW) represents the maximum depth to groundwater measurement collected from an individual well.

Fall/Winter Median Groundwater Level represents the average historical recovery level for each well. Determined by using groundwater level data recorded in the Fall/Winter after the well has had time to recover from irrigation season. The timeframe for median groundwater levels may vary depending on individual farm usage. Reclamation reserves the right to re-evaluate these data, if needed, as new data becomes available.

Introduction

This document has been prepared by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), in cooperation with the California Department of Water Resources (DWR) and the State Water Contractors.

Under the Warren Act of 1911, Reclamation may execute temporary contracts to convey non-project water in excess capacity in federal irrigation canals.

Reclamation proposes to enter into a 5-year Warren Act contract with Westlands. Under the terms of the contract, Westlands would introduce up to 30,000 acre-feet per year of non-Central Valley Project (CVP) water into the San Luis Canal (SLC) in years in which Westlands' CVP allocation is 20 percent or less. The period of introduction would be between April 1 and August 31 of a given year. However, as it was not possible to begin conveyance by April 1, 2020, the conveyance period for this year would be shifted by six months, to between October 5 and December 31. All subsequent years would use the April 1 to August 31 window.

The source of the non-CVP water would be pumped from groundwater wells within Westlands' district boundaries as well as other sources of non-CVP water by way of the Mendota Pool and Mendota Pool Inlet Canal. The amount of water from each source would vary, but the

total quantity introduced under the Proposed Action would not exceed a combined volume of 30,000 acre-feet in a given year.

This document describes the plan for measuring the changes in the quality of water in the SLC caused by the conveyance of this non-project water, in addition to changes in groundwater elevation to estimate subsidence.

San Luis Canal Non-Project Water Monitoring Program fundamental assumptions:

- 1) All sources of non-project water discharged into the SLC must comply with California Drinking Water standards (Title 22)¹. No in-canal dilution is allowed.
- 2) Each source of non-project water must be tested regularly to confirm that it is consistent, predictable, and acceptable in quality.
- 3) Staff from DWR will use real-time monitoring of salinity and turbidity in water in the SLC to identify any problems caused by the addition of the non-project water.

There are three potential sources of non-project water:

- 1) Groundwater pumped from wells adjacent to the SLC (Canal Integration Program);
- 2) Groundwater from wells that pump into the Lateral 7 inlet canal;
- 3) Groundwater pumped into the Mendota Pool by Mendota Pool Group participating wells.

Monitoring Mission and Goals

The mission of this monitoring program is to produce physical measurements that will determine the changes in the quality of water in SLC caused by the conveyance of non-project water. Data will be used to administer the terms of Warren Act Contracts and other exchange agreements, and to ensure that the quality of CVP water is suitable for downstream water users. The monitoring program will also measure changes to groundwater resources to prevent subsidence problems to local facilities.

The general goals of this monitoring plan are:

- 1) Evaluate the quality of water in each source of non-project water;

¹ California Code of Regulations, Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code (Sections 4010 4037), and Administrative Code (Sections 64401 et seq.), as amended.
http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dwregulations-2017-04-10.pdf

- 2) Confirm that non-project water entering the SLC is suitable for all downstream users;
- 3) Provide reliable data for administration of the contracts and agreements; and
- 4) Provide measurements of depth to groundwater to prevent subsidence.

Study Area

The Study Area (**Figure 1**) encompasses the SLC from the O'Neill Forebay (Check 13) to Kettleman City (Check 21), which is the federal portion of the California Aqueduct. **Figure 2** depicts the wells in Westlands along the SLC.

The study area also includes Westlands Lateral 7. For this program, Lateral 7 will be treated as one point of discharge. Water quality in Lateral 7 will be measured at the Adams Avenue pumping plant.

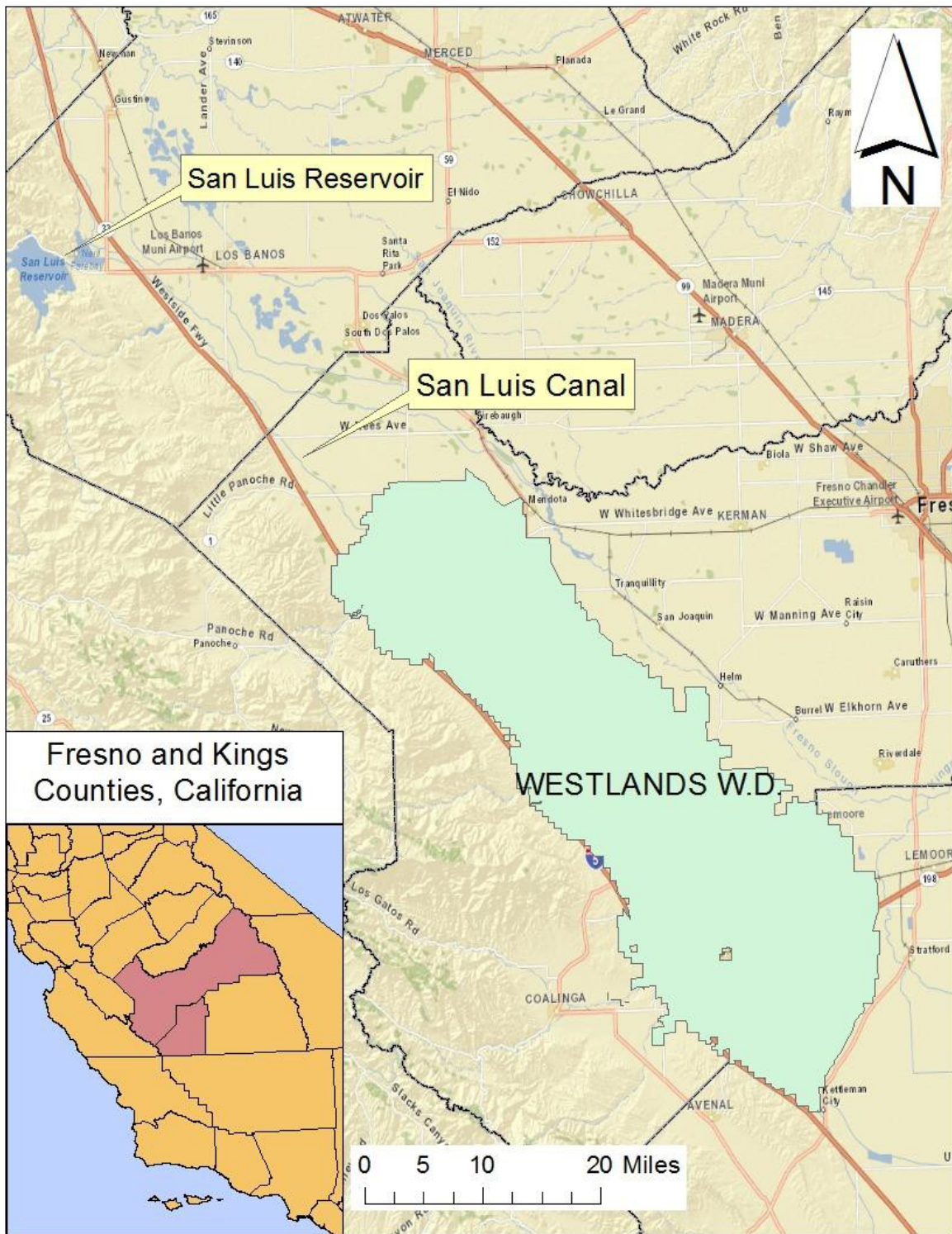


Figure 1. Project vicinity map

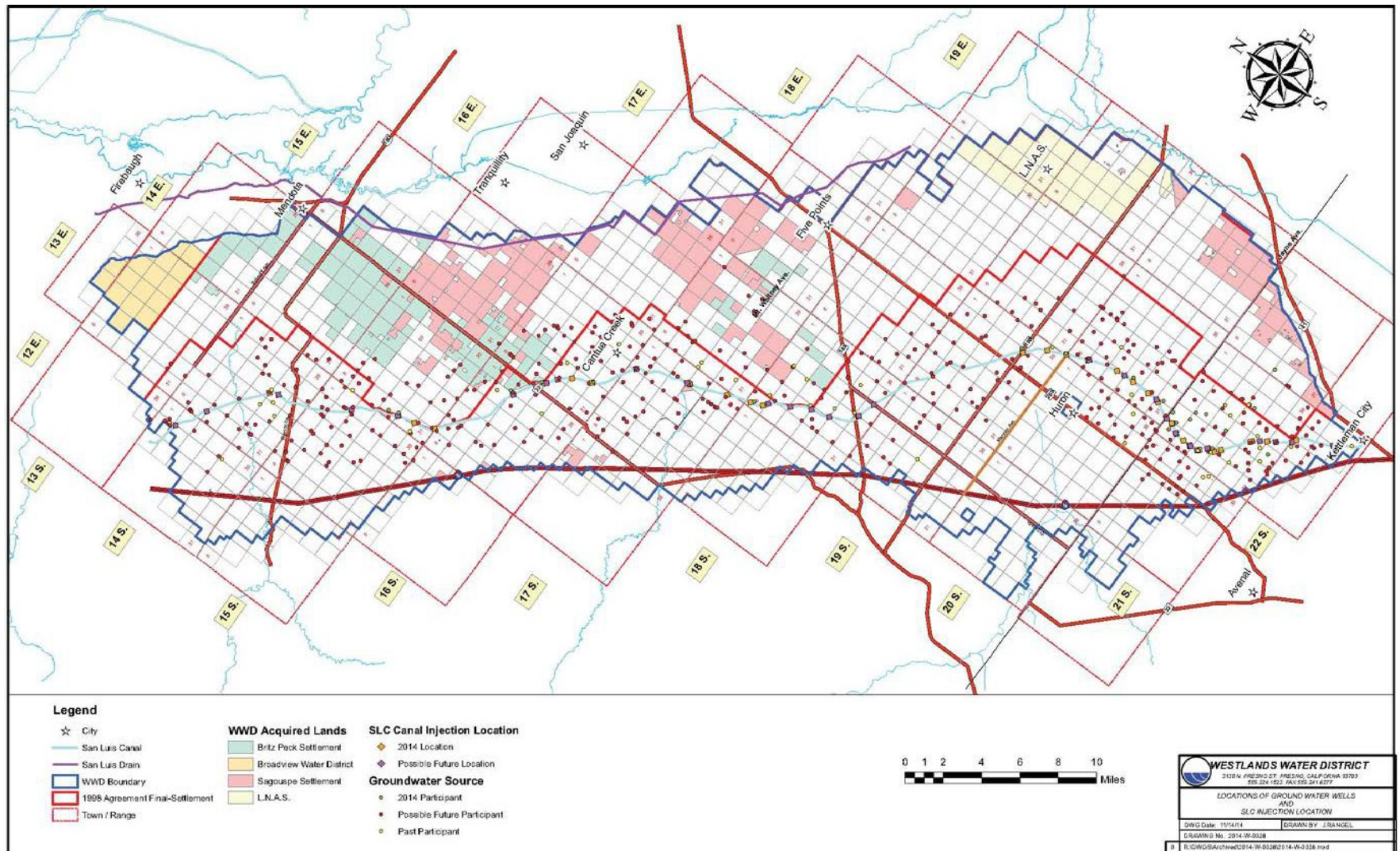


Figure 2. Location of Groundwater Wells within Westlands

Water Quality Monitoring Plan

All non-project water must meet the standards listed in **Tables 5 and 6** prior to entering the SLC. No dilution in the SLC will be allowed. Manifolded wells may discharge if the blend meets the standards listed in **Tables 5 and 6**.

All water quality analyses must be conducted by a laboratory listed in **Table 7**. All water samples must be sampled and preserved according to established protocols in correct containers. The costs of sampling and analysis of all non-project water will be borne by the well operators.

Sampling

Mendota Pool Group wells participating in this program are regulated by the Mendota Pool Group Groundwater Pump-in Program Monitoring Plan (MPG Monitoring Plan). These wells must meet the requirements outlined in the MPG Monitoring Plan prior to introduction into the Mendota Pool. To prevent redundant data collection, Mendota Pool Group wells are exempt from Baseline and Routine Sampling of Individual wells and Depth to Groundwater sampling as outlined in this document, this data is collected under the MPG Monitoring Plan. The cumulative effect of Mendota Pool water will be measured at Lateral 7.

Baseline Sampling of Individual Wells

Table 5 is a short list of constituents of concern to be measured in each well each year before pumping into the SLC to screen out non-compliant wells². There will be a one-time screening for the presence of Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) and if detected, Reclamation and DWR will work with Westlands on conducting additional sampling. Reference **Table 5** for new PFOA and PFOS sampling. Wells that do not meet this short list may not participate in the program.

Each well must be tested every three years for all constituents listed in **Table 6** before pumping in the SLC. Each report must clearly identify the location of each source of non-project water.

Reclamation, in coordination with DWR and the State Water Contractors, may allow minor exceedances of certain secondary Title 22 constituents if all primary standards are met.

All new wells proposed to participate in the program must be approved by Reclamation prior to discharging any groundwater into the SLC or Lateral 7.

² Reclamation will provide instructions for sampling groundwater.

Routine Sampling of Individual Wells

Each well must be tested weekly during the first four weeks of pumping for the short list of constituents (**Table 5**), then monthly while actively pumping into the SLC to confirm that the water quality is consistent, predictable, and reliable.

The short list may be modified, in consultation with DWR, to add constituents of concern or drop non-detected constituents.

Reclamation will allow the introduction of water from two or more wells through one discharge point if the blended water meets the Title 22 standards. Special monitoring may be required for these situations.

The following information must be submitted to Reclamation prior to pumping groundwater into the SLC:

- the location of each well, pumping rate, and point of discharge into the SLC;
- complete Title 22 water quality analyses for each well
- the depth to groundwater in each well before pumping into the SLC commences

When the Project is operating, Westlands will provide DWR and Reclamation with weekly schedules which identify the flow from the active wells.

Westlands will provide weekly updates identifying the current and anticipated water quality changes within the SLC by using the daily model. The goal is to provide Reclamation and the State Water Project Facilitation Group with a day-to-day prediction of downstream water quality using real-time pump-ins, real-time upstream background flows, and current background water quality data.

Lateral 7 Sampling

Non-project water will only enter Lateral 7 when water is being pumped into the SLC, not when flow is entering the Mendota Pool.

Westlands must collect samples from Lateral 7 at the Adams Avenue pump station. Lateral 7 water must be tested for the full suite of Title 22 (**Table 6**) every year. **Table 5** constituents will be sampled weekly for the first four weeks, then monthly for the duration of pumping at the locations listed in **Table 3**. There will be a one-time screening for the presence of Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) from Lateral 7 at Adams Avenue pump station and if detected, Reclamation and DWR will work with Westlands on conducting additional sampling. Reference **Table 5** for new PFOA and PFOS sampling.

Westlands must take weekly field measures for EC and turbidity at locations listed in **Table 3**.

Depth to Groundwater

Well owners will measure the initial depth to groundwater in each well before pumping into the SLC, and monthly from October through December and every other month outside of that range while the Pump-in Program is in effect. Measurements must be made using industry approved methods.

An individual well will be shutoff when its Depth to Groundwater reaches 75% of the difference between the Fall/Winter Median Groundwater Level and the Max DTGW using the following equation:

$$\text{Shutoff Trigger} = 0.75 * (\text{Max DTGW} - \text{Fall/Winter Median}) + \text{Fall/Winter Median}$$

If an individual well is shutoff due to groundwater levels reaching the shutoff trigger, it will not be allowed to resume pumping until it reaches 70% of the difference between the Fall/Winter Median Groundwater Level and the Max DTGW using the following equation:

$$\text{Well Resumption} = 0.70 * (\text{Max DTGW} - \text{Fall/Winter Median}) + \text{Fall/Winter Median}$$

Groundwater level measurements will follow a strict schedule. If a well is shutoff it will not be measured again until the next scheduled measurement date. The participants must notify Reclamation in writing when a well is shutoff or resuming. See Definitions section for explanation for Max DTGW and Fall/Winter Median.

Monitoring and Reporting

San Luis Canal Monitoring

Mean daily salinity and turbidity will be measured with the DWR sensors that report real-time data to CDEC (**Table 1**). Westlands will download daily average data for SLC Checks 13 and 21 to measure changes in the canal between these checks that may be attributable to the addition of the non-project water.

Westlands will use a mass balance model to estimate the contribution of salinity to the SLC from the actively pumping wells and Lateral 7 and compare this with the real-time data.

If the addition of the non-project water is increasing the salinity of water in the SLC more than 100 uS/cm between Check 13 and Check 21 (**Table 4**), Reclamation will work with Westlands and the well operators to turn off high salinity wells.

The addition of non-project water must not raise the salinity in the SLC at Check 21 above 700 uS/cm, equivalent to 450 mg/L Total Dissolved Solids (**Table 4**).

The addition of non-project water must not raise the sodium in the SLC at Check 21

above 80 mg/L (**Table 4**). If the sodium concentration does exceed 80 mg/L, Westlands will shut off wells with the highest concentration of sodium until the concentration at Check 21 is less than 80 mg/L, based on Westlands' blending model.

If the salinity of water passing Check 13 is greater than 700 uS/cm, Reclamation and Westlands will coordinate with DWR to modify or restrict non-project pumping.

If the addition of the non-project water from Lateral 7 is increasing the turbidity of water in the SLC more than 10 NTU (**Table 4**), Reclamation will work with Westlands to reduce discharge from the lateral. Changes in turbidity are measured by collecting samples upstream of and downstream of Lateral 7 (**Table 3**).

Westlands will run model simulations, as needed, to quantify anticipated improvements in conductivity with the termination of pumping from specific wells. The participating wells with the highest salinity will be targeted first, continuing to the wells with the lowest concentrations until canal water quality stabilizes or improves. As salinity at Check 21 improves, wells will be brought on-line to commence pumping.

DWR collects monthly grab samples at Checks 13 (KA007089) and 21 (KA017226) to measure trace metals and other minerals in the canal water. The data will be posted here:

San Luis Canal Check 13:

http://wdl.water.ca.gov/waterdatalibrary/waterquality/station_county/select_station.cfm?URLStation=KA007089&source=map

San Luis Canal Check 21:

http://wdl.water.ca.gov/waterdatalibrary/waterquality/station_county/select_station.cfm?URLStation=KA017226&source=map

DWR and Westlands will review these results to identify water quality changes in the SLC and will determine if they are caused by the addition of the non-project water.

Data Compilation and Review

All flow and water quality data collected by Westlands will be presented each month to Reclamation and DWR via e-mail. Reclamation will review the data to identify changes in the quality of water in the SLC and in individual wells, and potential changes in the local aquifer that could lead to overdraft or subsidence. Reclamation, in consultation with DWR, will direct Westlands on the continuation of pumping of groundwater into the SLC.

Access

Participating well owners must allow Reclamation and DWR staff permission to access the wells, if requested.

DWR Monitoring of Wells

DWR may collect samples for water quality testing for any constituents of concern from any Westlands source well or at any point of water entry into the Aqueduct for testing. DWR will use Bryte Chemical Laboratory or TestAmerica Labs for all DWR well sample analyses and the data will be available to Westlands for review. If any well tested by DWR is found to exceed the identified MCL's, Reclamation will direct Westlands to stop pumping immediately. The discharge must not resume unless it is demonstrated that adjustments have been made to the well or cluster of wells that allows it to discharge water that meets the required objectives. Westlands will coordinate with well operators to provide access for DWR personnel to conduct any of the following activities on private property within Westlands' service area during the term of this Proposal:

- Verification of metering calibration standards and requirements for flow meters located at the point of entry into the Aqueduct and at the point of delivery out of the Aqueduct,
- Collection of water samples from source wells and at the point of pump-in to the Aqueduct for testing of water quality,
- Any other activities deemed necessary by DWR to comply with the terms of this Proposal.

Revision

Reclamation reserves the right to modify this monitoring program at any time.

Revised: May 4, 2022

Table 1. Real-Time Monitoring Stations

Location	Operating Agency	Parameters	Frequency	Remarks
San Luis Canal Check 13 O'Neill Forebay	DWR	Electrical conductivity, turbidity	Real-time	CDEC Site: C13
San Luis Canal Check 21 Kettleman City				CDEC Site: C21

Key: CDEC: California Data Exchange Center
DWR: California Department of Water Resources

Table 2. Routine San Luis Canal Water Quality Monitoring Stations

Location	Agency	Parameters	Frequency	Remarks
San Luis Canal Check 13 O'Neill Forebay	DWR	Minerals, trace metals, nutrients, pesticides	Monthly	Grab sample
San Luis Canal Check 21 Kettleman City				Grab sample

Source: DWR Water Data Library

Table 3. Routine Monitoring of WWD Lateral 7

Location	Agency	Parameters	Frequency	Remarks
San Luis Canal Milepost 113.82 Lincoln Ave (upstream site)	Westlands	EC, turbidity short list	Weekly Weekly x 4, Monthly ³	Field measurements grab sample
Westlands Lateral 7 at Adams Avenue	Westlands	EC, turbidity short list	Weekly Weekly x 4, Monthly ³	Field measurements grab sample
San Luis Canal Milepost 117.47 Manning Ave (downstream site)	Westlands	EC, turbidity short list	Weekly Weekly x 4, Monthly ³	Field measurements grab sample

³ This water will also be tested for the short list of constituents weekly for the four weeks and monthly for the duration while water is being pumped into the canal.

Table 4. Maximum allowable changes in the San Luis Canal caused by the addition of non-project groundwater

Constituent	Monitoring Location	Maximum concentration in the San Luis Canal
Electrical conductivity	Between San Luis Canal Checks 13 and 21	Less than 100 uS/cm increase between the checks
Turbidity	Between the Lateral 7 upstream site and downstream site	Less than 10 NTU
Electrical conductivity	In the San Luis Canal at Check 21	Not to exceed 700 uS/cm
Total dissolved solids		Not to exceed 450 mg/L
Concentration of selenium		Not to exceed 2 ug/L
Concentration of sodium		Not to exceed 80 mg/L
Concentration of any Title 22 constituent		Less than half of a Title 22 MCL

If the maximum concentrations are exceeded in the canal, Reclamation will direct the District to reduce or terminate pumping of non-project water into the San Luis Canal. The District may provide a forecast from its water balance model to identify which wells to reduce or terminate, and whether to reduce or terminate pumping from Lateral 7.

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Table 5. Water Quality Standards, Short List

Constituent	Units	Maximum Contaminant Level	Detection Limit for Reporting	CAS Registry Number	Recommended Analytical Method
Arsenic	mg/L	0.010 (1)	0.002 (2)	7440-38-2	EPA 200.8
Boron	mg/L	2.0 (13)		7440-42-8	EPA 200.7
Bromide	mg/L	(14)			
Chloride	mg/L	250 (7)		16887-00-6	EPA 300.1
Chromium, total	mg/L	0.05 (1)	0.01 (2)	7440-47-3	EPA 200.7
Hexavalent chromium	mg/L	0.010 (1)	0.001 (2)	18540-29-9	EPA 200.8
Manganese	mg/L	0.05 (7)		7439-96-5	EPA 200.7
Nitrate (as NO ₃)	mg/L	45. (1)	2. (2)	7727-37-9	EPA 300.1
Selenium	mg/L	0.002 (10)	0.001	7782-49-2	EPA 200.8
Sodium	mg/L	200 (12)		7440-23-5	EPA 200.7
Specific Conductance	µS/cm	1,600 (7)			SM 2510B
Sulfate	mg/L	500 (7)		14808-79-8	EPA 300.1
Total Dissolved Solids	mg/L	1,000 (7)			SM 2540C
Total Organic Carbon	mg/L	(14)			EPA 415.3
Gross alpha*	pCi/L	15 (3)	3 (3)		SM 7110C
1,2,3-Trichloropropane	mg/L	0.000005 (4)	0.000005 (5)	96-18-4	SRL 524M

One-Time Screening

Perfluorooctanic acid (PFOA)**	ng/L	N/A	0.82 (15)	EPA 537.1
Perfluorooctanesulfonic acid (PFOS)**	ng/L	N/A	2.7 (15)	EPA 537.1

Short list to be measured before pumping occurs, then weekly for four consecutive weeks, and monthly for the duration of pumping into the San Luis Canal.

*Monthly testing only

**One-time screening conducted prior to pumping individual wells and from Lateral 7 at the Adams Avenue pump station. Although there are no MCLs developed yet, there are notification levels and response levels. The notification levels are 5.1 PPT (PFOA) and 6.5 PPT (PFOS). The response levels are 10 PPT (PFOA) and 40 PPT (PFOS) based on a running four quarter average. The lowest concentration minimum reporting levels (LCMRL) are 0.82 ng/L (PFOA) and 2.7 ng/L (PFOS).

Revised: 26 August 2021

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Table 6. Title 22 Water Quality Standards

Constituent	Units	Maximum Contaminant Level	Detection Limit for Reporting	CAS Registry Number	Recommended Analytical Method
Primary					
Aluminum	mg/L	1. (1)	0.05 (2)	7429-90-5	EPA 200.7
Antimony	mg/L	0.006 (1)	0.006 (2)	7440-36-0	EPA 200.8
Arsenic	mg/L	0.010 (1)	0.002 (2)	7440-38-2	EPA 200.8
Asbestos	MFL	7 (1)	0.2 MFL>10µm (2)	1332-21-4	EPA 100.2
Barium	mg/L	1. (1)	0.1 (2)	7440-39-3	EPA 200.7
Beryllium	mg/L	0.004 (1)	0.001 (2)	7440-41-7	EPA 200.7
Cadmium	mg/L	0.005 (1)	0.001 (2)	7440-43-9	EPA 200.7
Chromium, total	mg/L	0.05 (1)	0.01 (2)	7440-47-3	EPA 200.7
Copper	mg/L	1.3	0.050 (8)	7440-50-8	EPA 200.7
Cyanide	mg/L	0.15 (1)	0.1 (2)	57-12-5	EPA 335.2
Fluoride	mg/L	2.0 (1)	0.1 (2)	16984-48-8	EPA 300.1
Hexavalent Chromium	mg/L	0.010 (1)	0.001 (2)	18540-29-9	EPA 218.7
Lead	mg/L	0.015 (9)	0.005 (8)	7439-92-1	EPA 200.8
Mercury	mg/L	0.002 (1)	0.001 (2)	7439-97-6	EPA 245.1
Nickel	mg/L	0.1 (1)	0.01 (2)	7440-02-0	EPA 200.7
Nitrate (as NO ₃)	mg/L	45. (1)	2. (2)	7727-37-9	EPA 300.1
Nitrate + Nitrite (sum as nitrogen)	mg/L	10. (1)		14797-55-8	EPA 353.2

Nitrite (as nitrogen)	mg/L	1. (1)	0.4 (2)	14797-65-0	EPA 300.1
Perchlorate	mg/L	0.006 (1)	0.004 (2)	14797-73-0	EPA 314/331/332
Selenium	mg/L	0.002 (10)	0.001	7782-49-2	EPA 200.8
Thallium	mg/L	0.002 (1)	0.001 (2)	7440-28-0	EPA 200.8
Thiobencarb	mg/L	0.07		28249-77-6	EPA 527
Secondary					
Aluminum	mg/L	0.2 (6)		7429-90-5	EPA 200.7
Chloride	mg/L	500 (7)		16887-00-6	EPA 300.1
Color	units	15 (6)			EPA 110
Copper	mg/L	1.0 (6)	0.050 (8)	7440-50-8	EPA 200.7
Iron	mg/L	0.3 (6)		7439-89-6	EPA 200.7
Manganese	mg/L	0.05 (6)		7439-96-5	EPA 200.7
Methyl-tert-butyl ether (MTBE)	mg/L	0.005 (6)		1634-04-4	EPA 502.2/524.2
Odor -threshold	units	3 (6)			SM 2150B
Silver	mg/L	0.1 (6)		7440-22-4	EPA 200.7
Specific Conductance	µS/cm	1,600 (7)			SM 2510 B
Sulfate	mg/L	500 (7)		14808-79-8	EPA 300.1
Thiobencarb	mg/L	0.001 (6)		28249-77-6	EPA 527
Total Dissolved Solids	mg/L	1,000 (7)			SM 2540 C
Turbidity	units	5 (6)			EPA 190.1/SM2130B
Zinc	mg/L	5.0 (6)		7440-66-6	EPA 200.7
Other Required Analyses					
Boron	mg/L	2.0 (13)		7440-42-8	EPA 200.7
Molybdenum	mg/L	0.01 (11)		7439-98-7	EPA 200.7
Sodium	mg/L	200 (12)		7440-23-5	EPA 200.7

Radioactivity							
Gross Alpha	pCi/L	15	(3)	3	(3)	SM 7110C	
Organic Chemicals							
(a) Volatile Organic Chemicals (VOCs)							
Benzene	mg/L	0.001	(4)	0.0005	(5)	71-43-2	EPA 502.2/524.2
Carbon Tetrachloride	mg/L	0.0005	(4)	0.0005	(5)	56-23-5	EPA 502.2/524.2
1,2-Dichlorobenzene	mg/L	0.6	(4)	0.0005	(5)	95-50-1	EPA 502.2/524.2
1,4-Dichlorobenzene	mg/L	0.005	(4)	0.0005	(5)	106-46-7	EPA 502.2/524.2
1,1-Dichloroethane	mg/L	0.005	(4)	0.0005	(5)	75-34-3	EPA 502.2/524.2
1,2-Dichloroethane	mg/L	0.0005	(4)	0.0005	(5)	107-06-2	EPA 502.2/524.2
1,1-Dichloroethylene	mg/L	0.006	(4)	0.0005	(5)	75-35-4	EPA 502.2/524.2
cis-1,2-Dichloroethylene	mg/L	0.006	(4)	0.0005	(5)	156-59-2	EPA 502.2/524.2
trans-1,2-Dichloroethylene	mg/L	0.01	(4)	0.0005	(5)	156-60-5	EPA 502.2/524.2
Dichloromethane	mg/L	0.005	(4)	0.0005	(5)	75-09-2	EPA 502.2/524.2
1,2-Dichloropropane	mg/L	0.005	(4)	0.0005	(5)	78-87-5	EPA 502.2/524.2
1,3-Dichloropropene	mg/L	0.0005	(4)	0.0005	(5)	542-75-6	EPA 502.2/524.2
Ethylbenzene	mg/L	0.3	(4)	0.0005	(5)	100-41-4	EPA 502.2/524.2
Methyl-tert-butyl ether	mg/L	0.013	(4)	0.003	(5)	1634-04-4	EPA 502.2/524.2
Monochlorobenzene	mg/L	0.07	(4)	0.0005	(5)	108-90-7	EPA 502.2/524.2
Styrene	mg/L	0.1	(4)	0.0005	(5)	100-42-5	EPA 502.2/524.2
1,1,2,2-Tetrachloroethane	mg/L	0.001	(4)	0.0005	(5)	79-34-5	EPA 502.2/524.2
Tetrachloroethylene (PCE)	mg/L	0.005	(4)	0.0005	(5)	127-18-4	EPA 502.2/524.2
Toluene	mg/L	0.15	(4)	0.0005	(5)	108-88-3	EPA 502.2/524.2
1,2,4-Trichlorobenzene	mg/L	0.005	(4)	0.0005	(5)	120-82-1	EPA 502.2/524.2
1,1,1-Trichloroethane	mg/L	0.200	(4)	0.0005	(5)	71-55-6	EPA 502.2/524.2
1,1,2-Trichloroethane	mg/L	0.005	(4)	0.0005	(5)	79-00-5	EPA 502.2/524.2
Trichloroethylene (TCE)	mg/L	0.005	(4)	0.0005	(5)	79-01-6	EPA 502.2/524.2
Trichlorofluoromethane	mg/L	0.15	(4)	0.005	(5)	75-69-4	EPA 502.2/524.2

1,1,2-Trichloro-1,2,2-Trifluoroethane	mg/L	1.2	(4)	0.01	(5)	76-13-1	SM 6200B
Vinyl Chloride	mg/L	0.0005	(4)	0.0005	(5)	75-01-4	EPA 502.2/524.2
Xylenes	mg/L	1.750*	(4)	0.0005	(5)	1330-20-7	EPA 502.2/524.2
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)							
Alachlor	mg/L	0.002	(4)	0.001	(5)	15972-60-8	EPA 505/507/508
Atrazine	mg/L	0.001	(4)	0.0005	(5)	1912-24-9	EPA 505/507/508
Bentazon	mg/L	0.018	(4)	0.002	(5)	25057-89-0	EPA 515.1
Benzo(a)pyrene	mg/L	0.0002	(4)	0.0001	(5)	50-32-8	EPA 525.2
Carbofuran	mg/L	0.018	(4)	0.005	(5)	1563-66-2	EPA 531.1
Chlordane	mg/L	0.0001	(4)	0.0001	(5)	57-74-9	EPA 505/508
2,4-D	mg/L	0.07	(4)	0.01	(5)	94-75-7	EPA 515.1
Dalapon	mg/L	0.2	(4)	0.01	(5)	75-99-0	EPA 515.1
Dibromochloropropane	mg/L	0.0002	(4)	0.00001	(5)	96-12-8	EPA 502.2/504.1
Di(2-ethylhexyl)adipate	mg/L	0.4	(4)	0.005	(5)	103-23-1	EPA 506
Di(2-ethylhexyl)phthalate	mg/L	0.004	(4)	0.003	(5)	117-81-7	EPA 506
Dinoseb	mg/L	0.007	(4)	0.002	(5)	88-85-7	EPA 5151-4
Diquat	mg/L	0.02	(4)	0.004	(5)	85-00-7	EPA 549.2
Endothall	mg/L	0.1	(4)	0.045	(5)	145-73-3	EPA 548.1
Endrin	mg/L	0.002	(4)	0.0001	(5)	72-20-8	EPA 505/508
Ethylene Dibromide	mg/L	0.00005	(4)	0.00002	(5)	106-93-4	EPA 502.2/504.1
Glyphosate (Roundup)	mg/L	0.7	(4)	0.025	(5)	1071-83-6	EPA 547
Heptachlor	mg/L	0.00001	(4)	0.00001	(5)	76-44-8	EPA 508
Heptachlor Epoxide	mg/L	0.00001	(4)	0.00001	(5)	1024-57-3	EPA 508
Hexachlorobenzene	mg/L	0.001	(4)	0.0005	(5)	118-74-1	EPA 505/508
Hexachlorocyclopentadiene	mg/L	0.05	(4)	0.001	(5)	77-47-4	EPA 505/508
Lindane (gamma-BHC)	mg/L	0.0002	(4)	0.0002	(5)	58-89-9	EPA 505/508
Methoxychlor	mg/L	0.03	(4)	0.01	(5)	72-43-5	EPA 505/508
Molinate	mg/L	0.02	(4)	0.002	(5)	2212-67-1	EPA 525.1
Oxamyl	mg/L	0.05	(4)	0.02	(5)	23135-22-0	EPA 531.1
Pentachlorophenol	mg/L	0.001	(4)	0.0002	(5)	87-86-5	EPA 515.1-3

Picloram	mg/L	0.5 (4)	0.001 (5)	1918-02-1	EPA 515.1-3
Polychlorinated Biphenyls	mg/L	0.0005 (4)	0.0005 (5)	1336-36-3	EPA 130.1
Simazine	mg/L	0.004 (4)	0.001 (5)	122-34-9	EPA 505
Thiobencarb (Bolero)	mg/L	0.07 (4)	0.001 (5)	28249-77-6	EPA 527
Toxaphene	mg/L	0.003 (4)	0.001 (5)	8001-35-2	EPA 505
1,2,3-Trichloropropane	mg/L	0.000005 (4)	0.000005 (5)	96-18-4	SRL 524M
2,3,7,8-TCDD (Dioxin)	mg/L	3 x 10 ⁻⁸ (4)	5 x 10 ⁻⁹ (5)	1746-01-6	EPA 130.3
2,4,5-TP (Silvex)	mg/L	0.05 (4)	0.001 (5)	93-72-1	EPA 515.1
Other Organic Chemicals					
Chlorpyrifos	ug/L	0.015 (11)		2921-88-2	EPA 8141A
Diazinon	ug/L	0.10 (11)		333-41-5	EPA 8141A

Sources:

Recommended Analytical Methods: <https://www.nemi.gov/home/>

Maximum Contaminant Levels:

Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code (Sections 4010-4037), and Administrative Code (Sections 64401 et seq.), as amended.

- (1) Title 22. Table 64431-A Maximum Contaminant Levels, Inorganic Chemicals
- (2) Title 22. Table 64432-A Detection Limits for Reporting (DLRs) for Regulated Inorganic Chemicals
- (3) Title 22. Table 64442 Radionuclide Maximum Contaminant Levels (MCLs) and Detection Levels for Purposes of Reporting (DLRs)
- (4) Title 22. Table 64444-A Maximum Contaminate Levels, Organic Chemicals
- (5) Title 22. Table 64445.1-A Detection Limits for Purposes of Reporting (DLRs) for Regulated Organic Chemicals
- (6) Title 22. Table 64449-A Secondary Maximum Contaminant Levels "Consumer Acceptance Contaminant Levels"
- (7) Title 22. Table 64449-B Secondary Maximum Contaminant Levels "Consumer Acceptance Contaminant Level Ranges"
- (8) Title 22. Table 64678-A DLRs for Lead and Copper

(9) Title 22, Section 64678 (d) Lead Action level

http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dwregulations-2015-07-16.pdf

California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. Revised June 2015

(10) Basin Plan, Table III-1 (ug/L) (selenium in Grasslands water supply channels)

(11) Basin Plan, Table III-2A. 4-day average (chronic) concentrations of chlorpyrifos & diazinon in San Joaquin River from Mendota to Vernalis

http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf

Ayers, R. S. and D. W. Westcot, *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).

(12) Ayers, Table 1 (mg/L) (sodium)

(13) Ayers, Table 1 (mg/L) (boron)

<http://www.fao.org/3/T0234E/T0234E00.htm>

(14) Requested by State Water contractors, no MCL specified.

California Regional Water Quality Control Board. PFAS Per-and Polyfluoroalkyl Substances.

(15) Testing Methods in California Drinking Water

<https://www.waterboards.ca.gov/pfas/>

Revised: 26 August 2021

**Table 7. Approved Laboratory List for the Mid-Pacific Region
Quality Assurance and Data Management Branch (MP-156)
Environmental Monitoring and Hazardous Materials Branch
(MP-157)**

Alpha Analytical Laboratories, Inc.	Address	208 Mason Street, Ukiah, CA 95482
	Contact	Robbie Phillips
	P/F	916-686-5190
	Email	robbie@alpha-labs.com
	Methods	<i>Inorganics in Water, Organics in Water</i>

APPL Laboratory	Address	908 North Temperance Avenue, Clovis, CA 93611
	Contact	Chue Moua, Project Manager
	P/F	(559) 275-2175 /direct: (559) 862-2155
	Email	cmoua@applinc.com
	Methods	<i>Inorganics in Water/Soil, Organics in Water/Soil</i>

Basic Laboratory	Address	2218 Railroad Avenue Redding, CA 96001
	Contact	Josh Kirkpatrick, Nathan Hawley, Melissa Hawley
	P/F	(530) 243-7234 / (530) 243-7494
	Email	jkirkpatrick@basiclab.com (QAO and PM), nhawley@basiclab.com, mhawley@basiclab.com (invoices), poilar@basiclab.com (sample custody), khawley@basiclab.com (sample custody)
	Methods	<i>Inorganics in Water/Soil, Organics in Soil, Hazardous Waste in Water/Soil</i>

Brooks Applied Labs	Address	18804 North Creek Parkway, Bothell, WA 98011
	Contact	Jeremy Maute
	P/F	206-632-6206 / 206-632-6016
	Email	jeremy@brooksapplied.com
	Methods	<i>Selenium Speciation</i>

Calscience Environmental Laboratories (under Eurofins ownership)	Address	7440 Lincoln Way, Garden Grove, CA 92841
	Contact	Don Burley
	P/F	714-895-5494 (ext. 203)/714-894-7501
	Email	DBurley@calscience.com
	Methods	<i>Organics in Water</i>

Eurofins Eaton Analytical, Inc. (formerly MWH Laboratories)	Address	750 Royal Oaks Drive Ste. 100, Monrovia, CA 91016 180 Blue Ravine Rd., Folsom, CA 95630
	Contact	Rosalynn Dang
	P/F	(626) 386-1250, Linda - (626) 386-1163, Rita cell (916) 996-5929, Rick - (626) 386-1157
	Email	RosalynnDang@EurofinsET.com
	Methods	<i>Organics in Water</i>

Fruit Growers Laboratory	Address	853 Corporation Street, Santa Paula, CA 93060
	Contact	David Terz, QA Director
	P/F	(805) 392-2024 / (805) 525-4172
	Email	davidt@fglinc.com
	Methods	<i>Inorganics in Water (Gross Alpha)</i>

Oilfield Environmental & Compliance	Address	307 Roemer Way Ste 300, Santa Maria, CA 93454
	Contact	Will update when assigned a PM
	P/F	805-922-4772
	Email	info@oecusa.com
	Methods	<i>(Approval Pending) Hazardous Waste in Water/Soil</i>

Pacific EcoRisk	Address	2250 Codelia Road, Fairfield, CA 94534
	Contact	Stephen L. Clark
	P/F	(707) 207-7760 / (707) 207-7916
	Email	slclark@pacificedorisk.com
	Methods	<i>Toxicity in Water/Sediments</i>

Physis	Address	1904 East Wright Circle, Anaheim, CA 92806
	Contact	Will update when assigned a PM
	P/F	1-714-602-5320 ext 204
	Email	markbaker@physislabs.com
	Methods	<i>(Approval Pending) Inorganics in Soil</i>

South Dakota Agricultural Laboratories	Address	Brookings Biospace, 1006 32nd Avenue, Suites 103,105, Brookings, SD 57006-4728
	Contact	Regina Wixon, Annie Mouw (sample custodian)
	P/F	(605) 692-7325 / (605) 692-7326
	Email	regina.wixon@sdaglabs.com, annie.mouw@sdaglabs.com
	Methods	<i>Selenium in Water/Soil/Sediments/Tissue (Plant/Animal)</i>

Western Environmental Testing Laboratories	Address	475 East Greg Street # 119 Sparks, NV 89431
	Contact	Logan Greenwood (PM), Andy Smith (QA Manager)
	P/F	(775) 355-0202 / (775) 355-0817
	Email	logang@wetlaboratory.com, andy@wetlaboratory.com
	Methods	<i>Inorganics in Water</i>

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