Appendix A: Response to Comments

Connor, Mary <mconnor@usbr.gov>

Clark's Fork Reclamation District # 2069 response to proposed Water conveyance

1 message

Ron Allvin <ronallvin@outlook.com> Fri, Jul 14, 2017 at 12:07 PM
To: "mconnor@usbr.gov" <mconnor@usbr.gov>

Allvin-1 Please be advised the our District is requesting a copy of the indicated EIR and hereby assert that before any water leaves the

Kings River Water Service Area we believe that the lower river be first in line for water resources before satisfying this proposal. Please include this information in the appropriate public comments section prior to any and all action completion. Thank you for your consideration.

Reclamations Response to Comments

Allvin - 1 Reclamation provided an Environmental Assessment pursuant to the National Environmental Policy Act for public review. Reclamation does not prepare EIR documents pursuant to California Environmental Quality Assessments.

Additional language has been added to page 12 of the EA. Pursuant to the agreement made effective May 26, 2005 by and between the Water Association and Westlands, Westlands may divert Available Water from the Mendota Pool when and as such Available Water is present. For purposes of this Agreement, Available Water shall be deemed to be "present in the Mendota Pool" when, but only when, the amount of water flowing in the Kings River channel below Pine Flat Dam is such that (i) all members of the Water Association are able to meet their then current water demands within the defined Kings River Service Area. (ii) Pursuant to certain Permanent High-Flow Channel Agreement by and between the Water Association and the Kings County Water District dated August 6, 1985, and any similar obligations imposed upon the Water Association and/or members of the Water association pursuant to licenses granted by the State Water Resources Control Board with respect to the use of Kings River water, are then being satisfied, and (iii) water is leaving the Kings River Service Area via the Fresno Slough channel and flowing into the Mendota Pool. Prior to initiation any diversion of Available Water, Westlands shall notify the Water Association Watermaster. The Water Association consents to Westlands' diversion of the Available Water under the terms and conditions of this agreement.

The comment letter has been included in the appropriate section of the final EA.

Connor, Mary <mconnor@usbr.gov>

Info request

1 message

Carol & James Verboon <vboonfrms@sti.net> Fri, Jul 14, 2017 at 12:35 PM
To: mconnor@usbr.gov
Cc: Ron Allvin <ronallvin@outlook.com>

Dear Ms. Kate Connor,

Verboon-1 in regards to Title:
Westlands Water District 5-year Warren Act Contract for Kings River Flows in the San Luis Canal. I request a detailed description of what constitutes "flood flows" on the Kings River. I also could find no environmental assessment regarding impacts to Kings River water users or habitat. Please forward any info you have regarding the above requests.

Thank you for your time and consideration.

Sincerely,

Jim Verboon

Reclamations Response to Comments

Verboon– 1 Additional language has been added to page 12 of the EA from time to time, significant runoff from the Kings River results in the temporary availability of Kings River water in excess of the demands of the members of the Water Association (the "Available Water"). By virtue of the Water Rights, the Water Association has consistently claimed title to all water flowing in the Kings River and has previously opposed attempts by third parties to divert Kings River water without the Water Association's consent. The Water Association therefore claims title to the Available Water by virtue of the Water Rights. Pursuant to the agreement made effective May 26, 2005 by and between the Water Association and Westalnds, Westlands may divert Available Water from the Mendota Pool when and as such Available Water is present. For purposes of this Agreement, Available Water shall be deemed to be "present in the Mendota Pool" when, but only when, the amount of water flowing in the Kings River channel below Pine Flat Dam is such that (i) all members of the Water Association are able to meet their then current water demands within the defined Kings River Service Area. (ii) Pursuant to certain Permanent High-Flow Channel Agreement by and between the Water Association and the Kings County Water District dated August 6, 1985, and any similar obligations imposed upon the Water Association and/or members of the Water association pursuant to licenses granted by the State Water Resources Control Board with respect to the use of Kings River water, are then being satisfied, and (iii) water is leaving the Kings River Service Area via the Fresno Slough channel and flowing into the Mendota Pool. Prior to initiation any diversion of Available Water, Westlands shall notify the Water Association Watermaster. The Water Association consents to Westlands' diversion of the Available Water under the terms and conditions of this agreement.

On page 12 of the Draft EA Reclamation analyzes the introduction of Kings River flood flows into the canal as flows are available. The Proposed Action would only occur under flood conditions. There would be no impacts to Kings River Users and/or habitat pursuant to this agreement.

Appendix B: San Luis Canal 2017 Draft Water Quality Monitoring Plan

RECLAMATION

Managing Water in the West

San Luis Canal
Non-Project Water Pump-in Program
2017 Water Quality Monitoring Plan

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

Revised: 27 July 2017

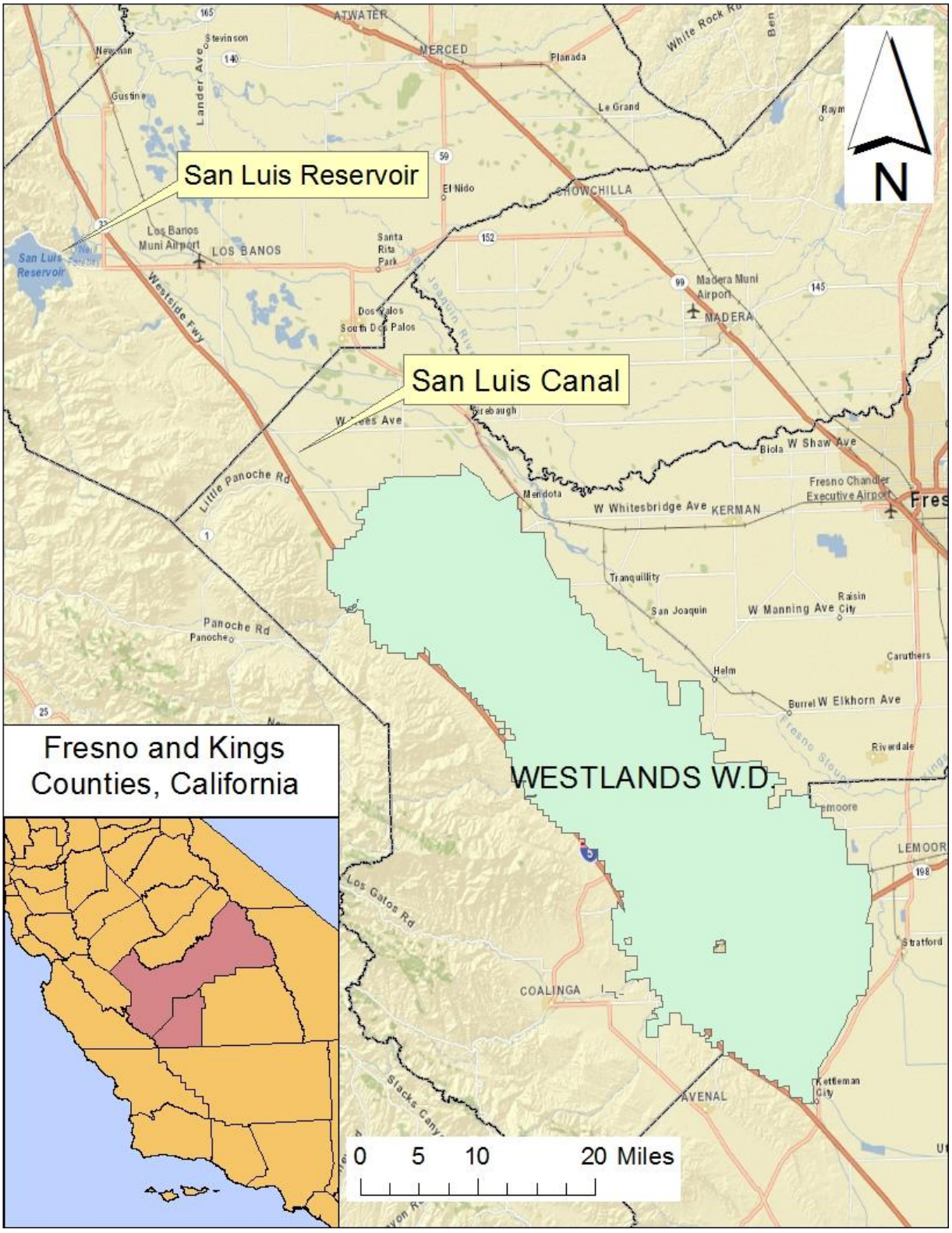
Mission Statements

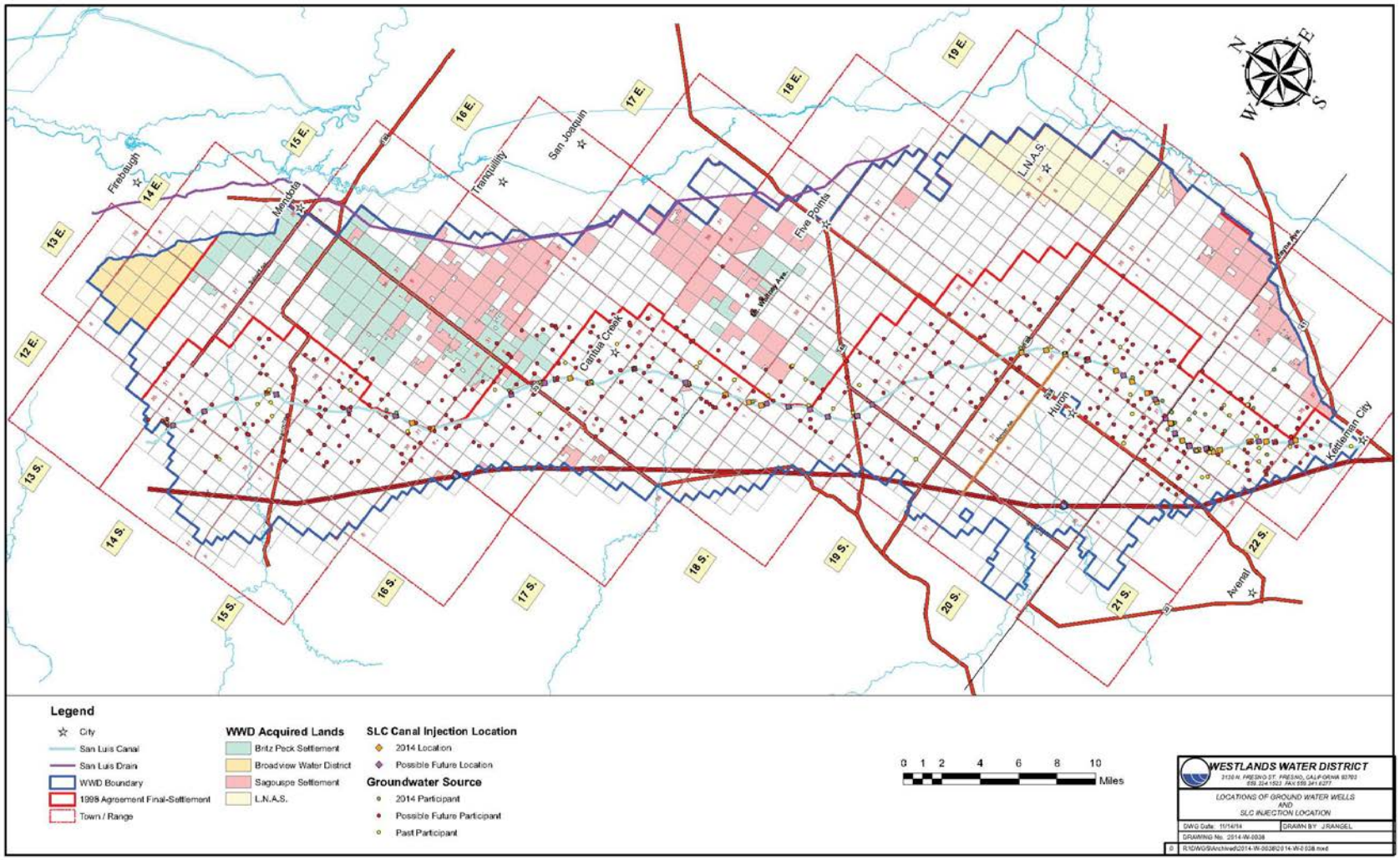
The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

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.

List of Abbreviations and Acronyms

COC	chain of custody
CVP	Central Valley Project
DWR	California Department of Water Resources
EC	electrical conductivity, µS/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
QA	Quality Assurance
QC	Quality Control
QCO	Quality Control Officer
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
San Luis Canal	the federal portion of the California Aqueduct
Check 13	San Luis Canal Milepost 66.74, O'Neill Forebay
Check 21	San Luis Canal Milepost 172.44, near Kettleman City
TDS	Total dissolved solids, mg/L
Title 22	California Drinking Water Standards
µg/L	micrograms per liter, equivalent to parts per billion
µS/cm	microSiemens per cm, salinity in water
Westlands or District	Westlands Water District


San Luis Reservoir
San Luis Canal
WESTLANDS W.D.
Fresno and Kings Counties, California
N
0 5 10 20 Miles
ATWATER
MERCED
Planada
Le Grand
Stevinson
Newman
Gustine
Lander Ave
El Nido
CHOWCHILLA
Los Banos Muni Airport
LOS BANOS
Santa Rita Park
Madera Muni Airport
MADERA
Dos Palos
South Dos Palos
Westside Fwy
Little Panoche Rd
Panoche Rd
Panoche
Firebaugh
Mendota
W Whitesbridge Ave
KERMAN
Biola
W Shaw Ave
Fresno Chandler Executive Airport
Tranquillity
San Joaquin
W Manning Ave
Raisin City
Helm
Burrel
W Elkhorn Ave
Caruthers
Riverdale
Lemoore
LEMOOR
Los Gatos Rd
Stratford
COALINGA
AVENAL
Kettleman City
San Luis Reservoir


Firebaugh
Mendota
Tranquility
San Joaquin
Five Points
L.N.A.S.
Huron
Kettleman City
Avenal
Cantua Creek
Jayne Ave.
W. Whitley Ave.
Legend
City
San Luis Canal
San Luis Drain
WWD Boundary
1998 Agreement Final-Settlement
Town / Range
WWD Acquired Lands
Britz Peck Settlement
Broadview Water District
Sagouspe Settlement
L.N.A.S.
SLC Canal Injection Location
2014 Location
Possible Future Location
Groundwater Source
2014 Participant
Possible Future Participant
Past Participant
0 1 2 4 6 8 10
Miles
WESTLANDS WATER DISTRICT
3130 N. FRESNO ST, FRESNO, CALIFORNIA 93703
559.324.1523 FAX 559.241.6277
LOCATIONS OF GROUND WATER WELLS
AND
SLC INJECTION LOCATION
DRAWN BY: J.RANGEL
DRAWING No: 2014-W-0038
R:\DWG\SA\Archived\2014-W-0038\2014-W-0038.mxd

San Luis Canal
Non-Project Water Pump-in Program
2017 Water Quality Monitoring Plan

Introduction

The overall supply of Central Valley Project (CVP) water has been reduced by drought and restrictions on pumping from the Sacramento-San Joaquin Delta. Under the Warren Act of 1911, Reclamation may execute temporary contracts to convey non-project water in excess capacity in federal irrigation canals.

In 2017, Reclamation will execute a five-year Warren Act contract with Westlands Water District (Westlands) to pump non-project water into the San Luis Canal to supplement the diminished supply of CVP water for its farmers. The non-project water will come from wells located beside the canal and wells located around the Mendota Pool. This would occur in years when the CVP allocation to Westlands is 20 percent or less, and generally between April 1 and August 31.

On rare occasions, flood water from the Kings River may be pumped into the canal. This would help with flood control in the Mendota area.

The non-project water would either be directly delivered to agricultural users in Westlands from the canal or exchanged for CVP water stored in San Luis Reservoir for later delivery to Westlands.

The San Luis Canal is jointly owned and operated by the United States and the State of California. The federal portion provides water for irrigation to the San Luis Unit between Santa Nella and Kettleman City, California. The State portion provides water mainly for municipal and industrial use in the Los Angeles basin. Consequently, the addition of non-project water must not cause any problems for downstream users. Water quality monitoring is an important component of this program.

The 2017 San Luis Canal Non-Project Water Monitoring Program fundamental assumptions:

1) All sources of non-project water must comply with California Drinking Water standards (Title 22)[1]. No in-canal dilution is allowed.

[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) Each source of non-project water must be tested regularly to confirm that it is consistent, predictable, and acceptable in quality.

3) Reclamation and DWR will use real-time monitoring of salinity and turbidity in water in the canal to identify any problems caused by the addition of the non-project water.

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

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.

Background

The federal Central Valley Project (CVP) delivers water to almost a million acres of farmland in the San Joaquin Valley of California. The CVP is also the sole source of clean water for several cities and for state, federal, and private wildlife areas in central California.

This water is suitable in quality for irrigation, wetlands, and domestic use. The region is regularly affected by droughts that drastically reduce the supply of water. Environmental regulations also restrict the operation of the federal and state pumping plants to divert water from the delta. The salinity of water in the Delta is highly variable due to the influence of tides and outflow of river water.

The source of CVP water for the western San Joaquin Valley is the Sacramento River conveyed through the Delta through the Delta-Mendota Canal. CVP water is pumped from this canal into the O'Neill Forebay and pumped again into San Luis Reservoir. CVP water is released back into the O'Neill Forebay and into the San Luis Canal.

The San Luis Canal is 102.5 miles long with a capacity ranging from 13,100 cfs at Check 13 (O'Neill Forebay) to 8,100 cfs at Check 21 (Kettleman City). This is the federal section of the California Aqueduct.

The canal continues southerly past Check 21 to deliver water to the State Water Contractors in southern California, mainly for municipal and industrial purposes. The Kern National Wildlife Refuge receives water indirectly from the canal in Kern County near Check 29 of the California Aqueduct.

Westlands Water District (Westlands) is the largest contractor for CVP water. Most the water from the San Luis Canal is delivered to farms across Westlands through buried

pressurized pipelines or “laterals”. CVP water is also delivered to Panoche, Pacheco, and San Luis Water Districts mainly for agricultural use.

WWD Lateral 7 is a buried pressurized pipeline connected to the San Luis Canal at Milepost 115.43L. The eastern end of Lateral 7 is connected to an open ditch that is linked to the Mendota Pool, south of the Mendota Wildlife Management Area. Water can be conveyed in this lateral in both directions.

During the drought years of 2014 and 2015, groundwater from wells around the Mendota Pool was pumped through Lateral 7 into the San Luis Canal. Some groundwater was pumped from wells directly into the canal as well. During spring 2017, flood water from the Kings River was pumped through Lateral 7 into the canal.

The Warren Act of 1911[2] authorizes Reclamation to execute temporary contracts to impound, store, and carry non-project water in federal irrigation canals when excess capacity is available. The Central Valley Project Improvement Act of 1992[3] allows Reclamation to negotiate other agreements which allow transfers of CVP water for non-project groundwater and conserved water.

As stated before, the CVP supply of water is limited by drought and environmental regulations. Farmers must use groundwater to supplement their limited supply of CVP water. The quality of local groundwater is variable and can have high concentrations of salts and trace metals. Many fields and orchards are not located near wells or the Mendota Pool. The 2017 San Luis Canal Non-Project Water Pump-in Program will help local farmers distribute water to remote crops and orchards across Westlands and other San Luis Unit districts.

There are three main sources of non-project water:

1) Groundwater pumped from wells beside the canal (Canal Integration Program);

2) Groundwater from wells beside the Mendota Pool, conveyed through Lateral 7 to the canal at Milepost 115.43L; and

3) Floodwater from the Kings River conveyed through Lateral 7 to the canal.

Our main concerns are

1) The potential degradation of water quality in the San Luis Canal with the addition of this non-project water, and

2) Possible, irreversible damage to CVP and district facilities through subsidence from continuous pumping of these wells.

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[2] Act of February 21, 1911, ch. 141, 36 Stat. 925

[3] Section 3405(a) of the Central Valley Project Improvement Act (CVPIA) (Title 34 of Public Law 102-575)

We will ask for sufficient information about each well to confirm that the pumped groundwater will be consistent, predictable, and acceptable in quality.

We will monitor the quality of the raw water in Lateral 7. Previous data indicate that flood water will be comparable to water in the canal, with low salinity and variable turbidity. Groundwater will tend to be higher in salinity and other minerals than the water in the canal.

We will monitor water quality in the canal upstream and downstream of the discharge from this lateral with field measurements and grab samples.

We will use real-time measurements of salinity and turbidity to track daily conditions in the canal. We will use routine monthly monitoring by DWR at Checks 13 and 21 to identify changes.

Reclamation will execute a general license with the San Luis Unit districts to install, operate, and maintain pump-in facilities across the canal embankment. Each discharge facility will have a totalizing flow meter, a corporation stop for calibration, and a spigot for water sample collection.

Staff from Westlands and DWR will calibrate flow meters on each point of discharge into the canal, and will record the volume pumped into the canal. Multiple wells may pump into the same discharge facility.

Staff from Westlands will coordinate all analyses of non-project water for this monitoring program, and compile all flow and water quality data for each source of non-project water. We will ask for depth to groundwater measurements in every participating well.

Reclamation will review these data to estimate contaminant loading in the canal, to confirm that the water in the canal is safe for downstream water users, to prevent subsidence, and to determine the feasibility of continuing this program in the future. All data will be shared with DWR and the State Water Contractors.

Monitoring Mission and Goals

The mission of this monitoring program is to produce physical measurements that will determine the changes in the quality of the water in San Luis Canal caused by the conveyance of non-project water. The 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.

Program Goals

The general goals of monitoring are:

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

- Confirm that the blend of CVP water and non-project water in the San Luis Canal is suitable for all downstream users;

- Provide reliable data for administration of the contracts and agreements; and

- Provide measurements of depth to groundwater to prevent subsidence.

Study Area

The Study Area is the San Luis Canal from the O'Neill Forebay (Check 13) to Kettleman City (Check 21). It is the federal portion of the California Aqueduct.

The study area includes the Mendota Pool, Fresno Slough, and Westlands Lateral 7.

Water Quality Standards

All non-project water must meet California Drinking Water Standards (Title 22) before entering the canal. These constituents are listed in **Table 5**. This should be conducted every three years.

Each discharge of non-project water must be tested for a short list of constituents to confirm that the water is consistent, predictable, and acceptable in quality. The short list was developed to comply with the California Department of Water Resources (DWR) policy for acceptance of non-project water into the State Water Project.

The short list measurements must be conducted weekly during the first month of operation, then monthly for the duration of pumping. The short list may be modified to add constituents. If the concentration of a constituent is consistently less than minimum laboratory detection level, we may drop it from the short list.

The non-project water must meet the Title 22 standards before entering the canal. No dilution in the canal will be allowed.

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

Water Quality Monitoring Plan

Groundwater from Wells beside the San Luis Canal (Canal Integration Program)

Baseline Tests of Individual Wells

Table 4 is a short list of constituents of concern to be measured in each well each year before pumping into the canal to screen out non-compliant wells[4]. Wells that do not meet this short list may not participate in the 2017 Pump-in Program.

Each well must be tested every three years for all of the constituents listed in **Table 5** before pumping in the San Luis Canal. Each report must clearly identify the location of the well.

All new wells proposed to participate in the 2017 pump-in program must be approved Reclamation prior to discharging any groundwater into the San Luis Canal.

Routine Tests of Individual Wells

Each well weekly during the first four weeks of pumping for the short list of constituents (**Table 4**), then monthly while actively pumping into the San Luis Canal to confirm that the water quality is consistent, predictable, and reliable.
The short list may be modified to add constituents of concern or drop non-detected constituents.

All water quality analyses should be conducted by a laboratory listed in **Table 6**. All water samples must be sampled and preserved according to established protocols in correct containers. Each sample of well water must be analyzed at the expense of the well owner.

The costs of sampling and analysis of all non-project water will be borne by the well operators.

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.

We will need the following information prior to pumping groundwater into the canal:

- the location of each well, pumping rate, and point of discharge into the San Luis Canal;

- complete Title 22 water quality analyses for each well

[4] Reclamation will provide instructions for sampling groundwater.

- the depth to groundwater in each well before pumping into the San Luis Canal commences

Most of the wells are privately owned, so we will need assistance from Westlands' staff to provide access to each well for Reclamation and DWR staff.

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 Monitoring

The water flowing through Lateral 7 may originate in many wells around the Mendota Pool or flood water from the Kings River. It would be impractical to monitor every well for this program, so we will focus on the composite water that is pumped into the Lateral.

Samples should be collected from the Lateral at the Adams Avenue pump station.

All water pumped into the San Luis Canal from Lateral 7 must be tested for the short list of constituents before pumping into the canal commences, then weekly for the first four weeks, then monthly for the duration of pumping.

The Lateral 7 water must be tested for the full suite of Title 22 constituents once a year while pumping into the canal occurs.

Please refer to Appendix B for more information about Lateral 7 monitoring.

Compliance Monitoring

Daily Salinity and Turbidity in the San Luis Canal

Mean daily salinity and turbidity will be measured with the DWR sensors that report real-time data to CDEC. Westlands and Reclamation will download daily average data for San Luis Canal 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 and Reclamation will use mass balance models to estimate the contribution of salinity to the canal 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 canal more than 100 uS/cm, Reclamation will work with Westlands and the well operators to turn off high salinity wells.

If the addition of the non-project water from Lateral 7 is increasing the turbidity of water in the canal more than 10 NTU, Reclamation will work with Westlands to reduce discharge from the lateral. Note: Turbidity is generally not a problem in groundwater.

Westlands will run model simulations 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.

Flow Monitoring of Non-Project Water

Westlands and DWR field staff will calibrate the flow meters for each discharge point and report the monthly volume of water pumped into the canal.

Routine Water Quality Monitoring – San Luis Canal

DWR will collect 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:

http://www.water.ca.gov/waterdatalibrary/waterquality/station_group/select_station.cfm

Reclamation will review these results to identify changes and will determine if they are caused by the addition of the non-project groundwater.

Routine Water Quality Monitoring – Lateral 7

Non-project water from the Mendota Pool Kings River will be pumped into the San Luis Canal from Westlands Lateral 7. Reclamation may take grab samples to confirm the short list results collected by the District.

Reclamation may make field measurements of water in the lateral and from the canal upstream and downstream of Milepost 115.43L.

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 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 the District to stop pumping pending resampling and retesting by an independent laboratory.

Westlands will coordinate with well operators to provide access for DWR personnel to conduct any of the following activities on private property within WWD's 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.

Depth to Groundwater

Westlands staff will measure the initial depth to groundwater in each well before pumping into the canal, and twice a year while the 2017 Warren Act is in effect. The current depth to groundwater in each well will be compared to the initial depth measurement. If the current depth is more than 25 feet below the initial depth, Reclamation advise the District that pumping from that well be stopped until the depth recovers to an agreed upon depth.

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 canal 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 WWD on the continuation of pumping of groundwater into the San Luis Canal.

Water Quality Monitoring Parameters and Data Management

The following sections describe the parameters for real-time and laboratory measurement of water quality, as well as methods for quality control, data management, and data reporting.

Real-Time Water Quality Monitoring Parameter

DWR operates sensors along the San Luis Canal that measure salinity and turbidity of water. These continuous measurements are posted on the Internet at:

http://cdec.water.ca.gov/

Site	CDEC Code
San Luis Canal Check 13	C13
San Luis Canal Check 21	C21

The values are preliminary and subject to calibration by DWR.

Salinity

Salinity is a measure of dissolved solids in water. It is the sum weight of many different elements within a given volume of water, reported in milligrams per liter (mg/L) or parts per million (ppm). Salinity is an ecological factor of considerable importance, influencing the types of organisms that live in a body of water. Also, salinity influences the kinds of plants and fish that will grow in a water body. Salinity can be estimated by measuring the electrical conductivity (EC) of the water.

Turbidity

Turbidity is the cloudiness or haziness of a fluid caused by large numbers of individual particles that are generally invisible to the naked eye, similar to smoke in air. The measurement of turbidity is a key test of water quality.

Fluids can contain suspended solid matter consisting of particles of many different sizes. While some suspended material will be large enough and heavy enough to settle rapidly to the bottom of the container if a liquid sample is left to stand (the settable solids), very small particles will settle only very slowly or not at all if the sample is regularly agitated or the particles are colloidal. These small solid particles cause the liquid to appear turbid.

The propensity of particles to scatter a light beam focused on them is now considered a more meaningful measure of turbidity in water. Turbidity measured this way uses an instrument called a nephelometer with the detector set up to the side of the light beam. More light reaches the detector if there are lots of small particles scattering the source beam than if there are few. The units of turbidity from a calibrated nephelometer are called Nephelometric Turbidity Units (NTU). To some extent, how much light reflects for a given amount of particulates is dependent upon properties of the particles like their shape, color, and reflectivity. For this reason (and the reason that heavier particles settle quickly and do not contribute to a turbidity reading), a correlation between turbidity and total suspended solids (TSS) is somewhat unusual for each location or situation.

Sampling For Laboratory Analyses of Water Quality

The following sections describe constituents for laboratory analyses of water quality, as well as methods for water quality sampling and chain of custody documentation.

Constituents

Table 4 is a short list of constituents to be measured at in each source of non-project water prior to pumping into the San Luis Canal. The costs for collection and lab analyses for the short list tests will be paid the district.

Once the source passes the short list, the operator must have the well tested for the full suite of Title 22 constituents listed in **Table 5**. All water analyses should be conducted by a laboratory that has been audited and approved by Reclamation listed in Table 6. Note all costs to collect and analyze the water for the Title 22 constituents must be paid by the District.

Once the Title 22 standards have been met, then that water may be pumped into the canal, subject to these routine short list tests:

- Weekly, for the first four weeks, to confirm that the water in the well is consistent, predictable, and acceptable

- Monthly, for the duration of pumping, and

- Beginning of each year during the term of the 2015 Warren Act Contract.

Note that the full Title 22 list must be measured every three years.

Sampling Methods

Grab samples will be collected in a bucket or bottle from the point of discharge into the canal. Samples of canal water should be collected mid-stream from a bridge or check structure. Grab samples should be poured directly into sample bottles appropriate to the analyses. The laboratory will specify the sample volume, type of bottle, need for preservative, and special handling requirements for each constituent.

Chain of Custody documentation

Chain of custody (COC) forms will be used to document sample location, collection time, containers, preservation, and analysis. All individuals transferring and receiving samples will sign, date, and record the time on the COC that the samples are transferred. Laboratory COC procedures are described in each laboratory's Quality Assurance Program Manual. Laboratories must receive the COC documentation submitted with each batch of samples and sign, date, and record the time the samples are transferred. Laboratories will also note any sample discrepancies (e.g., labeling, breakage). After generating the laboratory data report for the client, samples will be stored for a minimum

of 30 days in a secured area prior to disposal, or in accordance with the laboratory's protocols for retention of samples.

Quality Control

Quality control (QC) is the overall system of technical activities that measure the attributes and performance of a process, item, or service against defined standards to verify that stated requirements are met.

Quality assurance (QA) is an integrated system of management activities involving, planning, implementation, documentation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the customer. QA objectives will be used to validate the data for this project. The data will be accepted, rejected, or qualified based on how sample results compare to established acceptance criteria.

The precision, accuracy, and contamination criteria will be used by the QCO to validate the data for this project. The criteria will be applied to the blind external duplicate/split, blank, reference, or spiked samples submitted with the production samples to the analytical laboratories by the participating agencies to provide an independent assessment of precision, accuracy, and contamination.

Reclamation may incorporate QC samples into batches of samples to verify the accuracy of the laboratory.

Laboratories analyze their own QC samples with the client's samples. Laboratory QC samples, including laboratory fortified blanks, matrix spikes, duplicates, and method blanks, assess precision, accuracy, and contamination. Laboratory QC criteria are stated in the analytical methods or determined by each laboratory. Since internal control ranges are often updated in laboratories based on instrumentation, personnel, or other influences, it is the responsibility of the QCO to verify that these limits are well documented and appropriately updated during system audits. The preferred method of reporting the QC results is for the laboratory to provide a QC summary report with acceptance criteria for each QC parameter of interest.

For water samples, the QCO will use a statistical program to determine if current concentrations for parameters at given sites are consistent with the historical data at these sites. A result is determined to be a historical outlier if it is greater than 3 standard deviations from the average value for the site. The presence of an outlier could indicate an error in the analytical process or a significant change in the environment.
Samples must be prepared, extracted, and analyzed within the recommended holding time for the parameter. Data may be qualified if the sample was analyzed after the holding time expires.

Completeness refers to the percentage of project data that must be successfully collected, validated, and reported to proceed with its intended use in making decisions.

Constraints with regard to time, money, safety, and personnel were some of the factors in choosing the most representative sites for this project. Monitoring sites have been selected by considering the physical, chemical, and biological boundaries that define the system under study.

Sites also were selected to be as representative of the system as possible. However, Reclamation will continue to evaluate the choice of the sites with respect to their representativeness and will make appropriate recommendations to the Contracting Officer given a belief or finding of inadequacy.

Comparability between each agency's data is enhanced through the use of Standard Operating Procedures that detail methods of collection and analysis. Each agency has chosen the best available protocol for the sampling and analyses for which it is responsible based on the agency's own expertise. Audits performed by the QCO will reinforce the methods and practices currently in place and serve to standardize techniques used by the agencies.

Data Management

This program will use data from several independent sources. Each collecting agency will be responsible for its data reduction (analysis), internal data quality control, data storage, and data retrieval.

Real-Time Data – Raw data from field sensors, must be identified as preliminary, subject to change.

Provisional Data - Data that have been reviewed by the collecting agency but may be changed pending re-analyses or statistical review.

Laboratory Data – Data produced by the laboratory following laboratory QA/QC protocols.

Data Reporting

Real-time measurements of salinity and turbidity in the San Luis Canal will be taken by DWR and reported on the California Data Exchange Center. In-stream water quality data will be collected by DWR and Reclamation. Routine measurements of flow from each discharge facility will be taken by District staff, as well as depth of groundwater in each well. All data will be compiled by Reclamation into monthly summary reports that will be shared with DWR, WWD, and the State Water Contractors.

Westlands will issue daily and weekly summaries of the pump-ins.

Westlands and Reclamation will compile salinity data in water balance models to predict the change in salinity in the canal with the addition of groundwater, and compare this with the real-time measurements.

Reclamation and Westlands will compile all flow, water quality, and groundwater data into a final report for future reference.

Data Interpretation

Reclamation and Westlands will share all data for the canal and all wells pumping into the canal with DWR and the State Water Contractors.

Each week, Westlands staff will compile flow measurements. Reclamation will compile real-time salinity and turbidity measurements to determine the changes in the canal. Westlands and Reclamation will use separate mass balances to estimate how much of the observed changes are caused by the conveyance of non-project in the San Luis Canal.

Reclamation will also review monthly water quality reports published by DWR to identify changes and will use the mass balance to determine how the non-project water has affected the canal.

Enforcement of Water Quality Standards

Reclamation will monitor the changes in instream salinity and water quality between Checks 13 and 21 using real-time data and results of monthly grab samples reported by DWR. **Table 3** is a list of the maximum allowable changes in salinity and water quality attributable to the addition of the non-project groundwater.

Reclamation and DWR may conduct field measurements of each discharge to confirm that water quality standards are being met. If any discharge is found not to meet the Title 22 limits, Reclamation will require Westlands to stop the pump-in of non-project water into the Aqueduct.

Reclamation will direct Westlands to stop the pump-in program if, in the judgment of DWR and Reclamation, its continuance could result in disruption of or damage to the SWP, including but not limited to unacceptable degradation of water quality.

Reclamation reserves the right to modify this monitoring program at any time. Additional constituents of concerns may be identified upon review of the well and instream data and be added to the monitoring as determined by DWR and Reclamation.

Revised: 07 July 2017

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 2a. 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 2b. Routine Monitoring of WWD Lateral 7

Location	Agency	Parameters	Frequency	Remarks
San Luis Canal Milepost 113.82 Lincoln Ave (upstream site)	Reclamation	EC, turbidity	Weekly	Field measurements
Westlands Lateral 7 at Adams Avenue	Reclamation	EC, turbidity, short list	Weekly x 4, Monthly[5]	Field measurements, grab sample
San Luis Canal Milepost 117.47 Manning Ave (downstream site)	Reclamation	EC, turbidity, selenium	Weekly	Field measurements

[5] This water will also be tested for the short list of constituents weekly for the first month and monthly for the duration while water is being pumped into the canal.

Table 3. 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
Daily Change in Electrical conductivity	Between San Luis Canal Checks 13 and 21	Less than 100 uS/cm increase between the checks
Daily change in turbidity		Less than 10 NTU
Concentration of selenium	In the San Luis Canal at Check 21	Not to exceed 2 ug/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 form Lateral 7.

Table 4. Water Quality Standards, Short List

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

Table 4. Water Quality Standards, Short List

Constituent	Units	Maximum Contaminant Level		Detection Limit for Reporting		CAS Registry Number	Recommended Analytical Method
Arsenic	mg/L	0.01	(1)	0.002	(2)	7440-38-2	EPA 200.8
Boron	mg/L	0.7	(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	0.005	(1)	0.001	(2)	7440-47-3	EPA 200.7
Hexavalent chromium	mg/L	0.010	(1)	0.0004	(2)	18540-29-9	EPA 200.8
Manganese	mg/L	0.05	(1)			7439-96-5	EPA 200.7
Nitrate (as nitrogen)	mg/L	10	(1)	0.4	(2)	7727-37-9	EPA 300.1
Selenium	mg/L	0.002	(10)	0.0004	(2)	7782-49-2	EPA 200.8
Sodium	mg/L	69	(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

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

Revised: 27 July 2017

Table 5. Water Quality Standards, Full Title 22 Analysis

San Luis Canal

Non-Project Water Pump-in Program
2017 Water Quality Monitoring Plan

Table 5. 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	0.01 (1)	0.002 (2)	7440-38-2	EPA 200.8
Asbestos	MFL	7 (1)	0.2 MFL>10um (2)	1332-21-4	EPA 100.2
Barium	mg/L	1 (1)	0.1 (2)	7440-39-3	EPA 200.7
Beryllium	mg/L	0.004 (1)	0.001 (2)	7440-41-7	EPA 200.7
Cadmium	mg/L	0.005 (1)	0.001 (2)	7440-43-9	EPA 200.7
Chromium, total	mg/L	0.05 (1)	0.01 (2)	7440-47-3	EPA 200.7
Copper	mg/L	1.3		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 nitrogen)	mg/L	10 (1)	0.4 (2)	7727-37-9	EPA 300.1
Nitrate + Nitrite (sum as nitrogen)	mg/L	10 (1)		14797-55-8	EPA 353.2

Nitrite (as nitrogen)	mg/L	1	(1)	0.4	(2)	14797-65-0	EPA 300.1
Perchlorate	mg/L	0.006	(1)	0.004	(2)	14797-73-0	EPA 314/331/332
Selenium	mg/L	0.002	(10)	0.0004	(2)	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	200	(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	(6)	0.05	(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	0.013	(4)			1634-04-4	EPA 502.2/524.2
Odor -threshold	units	3	(6)				SM 2150B
Silver	mg/L	0.1	(6)			7440-22-4	EPA 200.7
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	(6)			7440-66-6	EPA 200.7
Other Required Analyses							
Boron	mg/L	0.7	(13)			7440-42-8	EPA 200.7
Molybdenum	mg/L	0.01	(11)			7439-98-7	EPA 200.7
Sodium	mg/L	69	(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	0.2	(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)	0.0001	(5)	87-86-5	EPA 515.1-3

Picloram	mg/L	0.5	(4)	0.001	(5)	1918-02-1	EPA 515.1-3
Polychlorinated Biphenyls	mg/L	0.0005	(4)	0.0005	(5)	1336-36-3	EPA 130.1
Simazine	mg/L	0.004	(4)	0.001	(5)	122-34-9	EPA 505
Thiobencarb (Bolero)	mg/L	0.07	(4)	0.001	(5)	28249-77-6	EPA 527
Toxaphene	mg/L	0.003	(4)	0.001	(5)	8001-35-2	EPA 505
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 21 (mg/L) (boron)

http://www.fao.org/DOCREP/003/T0234E/T0234E00.HTM

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

revised: 27 July 2017

Table 6. List of Reclamation Approved Laboratories

RECLAMATION
Managing Water in the West

Table 6. 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	Adam Angulo
	P/F	916-686-5190
	Email	adam@alpha-labs.com
	Methods	*Inorganics in Water, Organics in Water*

APPL Laboratory	**Address**	908 North Temperance Avenue, Clovis, CA 93611
	Contact	Renee' Patterson, Project Manager
	P/F	(559) 275-2175 / (559) 275-4422
	Email	rpatterson@applinc.com; danderson@applinc.com;
	Methods	*Approved for inorganic and organic parameters in water and soil*

Basic Laboratory	**Address**	2218 Railroad Avenue Redding, CA 96001
	Contact	Josh Kirkpatrick, Nathan Hawley, Melissa Hawley
	P/F	(530) 243-7234 / (530) 243-7494
	Email	jkirkpatrick@basiclab.com (QAO and PM); nhawley@basiclab.com, mhawley@basiclab.com (invoices); poilar@basiclab.com (sample custody), khawley@basiclab.com (sample custody)
	Methods	*Approved for inorganic/organic parameters*
Brooks Applied Labs	**Address**	18804 North Creek Parkway Bothell, WA 98011
	Contact	Jeremy Maute
	P/F	(206) 632-6206
	Email	Jeremy@brooksapplied.com
	Methods	*Approved for selenium speciation and mercury speciation in water, solids, and tissue*
California Laboratory Services	**Address**	3249 Fitzgerald Road Rancho Cordova, CA 95742
	Contact	Scott Furnas
	P/F	(916) 638-7301 / (916) 638-4510
	Email	janetm@californialab.com (QA); scottf@californialab.com (PM)
	Methods	*Approved for inorganic, organic, and microbiological parameters*

Calscience Environmental Laboratories	**Address**	7440 Lincoln Way; Garden Grove, CA 92841
	Contact	Don Burley
	P/F	714-895-5494 (ext. 203)/714-894-7501
	Email	DBurley@calscience.com
	Methods	*Approved for inorganic and organic parameters in water, sediment, and soil.*

Eurofins Eaton Analytical, Inc. (formerly MWH Laboratories)	**Address**	750 Royal Oaks Drive Ste. 100 Monrovia, CA 91016 USA
	Contact	Linda Geddes
	P/F	(626) 386-1100, Linda - (626) 386-1163, Rick - (626) 386-1157
	Email	LindaGeddes@eurofinsus.com
	Methods	*Approved for all inorganic, organic, radiochemistry, total coliform, & E. Coli parameters in water*

Fruit Growers Laboratory	**Address**	853 Corporation Street Santa Paula, CA 93060 USA
	Contact	David Terz, QA Director
	P/F	(805) 392-2024 / (805) 525-4172
	Email	davidt@fglinc.com
	Methods	*Approved for the analysis of inorganic parameters in water and soil*

Moore Twining Associates, Inc.	**Address**	2527 Fresno St., Fresno, CA 93721 USA
	Contact	Juli Adams (Lab Director), Maria Manuel (QA Manager)
	P/F	(559) 268-7021
	Email	julia@mooretwining.com, mariam@mooretwining.com
	Methods	*BOD*

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	*(Approval Pending) Hazardous Waste in Water/Soil*

Pacific EcoRisk	**Address**	2250 Codelia Road, Fairfield, CA 94534 USA
	Contact	Stephen L. Clark
	P/F	(707) 207-7760 / (707) 207-7916
	Email	slclark@pacificecorisk.com
	Methods	*Approved for acute and chronic toxicity.*

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	*(Approval Pending) Inorganics in Soil*

South Dakota Agricultural Laboratories	**Address**	Brookings Biospace, 1006 32nd Avenue, Suites 103,105, Brookings, SD 57006-4728
	Contact	Regina Wixon, Nancy Anderson, Jessie Davis (sample custodian)
	P/F	(605) 692-7325/(605) 692-7326
	Email	regina.wixon@sdaglabs.com, Nancy.Anderson@sdaglabs.com, jessica.davis@sdaglabs.com
	Methods	*Approved for selenium analysis*

Western Environmental Testing Laboratories	**Address**	475 East Greg Street # 119 Sparks, NV 89431 USA
	Contact	Scott Thompson (Client Services), Andy Smith (Lab Drctr)
	P/F	(775) 355-0202 / (775) 355-0817
	Email	scottt@wetlaboratory.com, andy@wetlaboratory.com
	Methods	*Approved for inorganic parameters (metals, general chemistry) and coliforms.*

Revised: 08 February 2017

Appendix A. Department of Water Resources Water Quality Policy and Implementation Process for Acceptance of Non-Project Water into the State Water Project (October 2012)

Department of Water Resources Water Quality Policy and Implementation Process for Acceptance of Non-Project Water into the State Water Project (October 2012)

It is the Department of Water Resources (DWR) policy to assist with the conveyance of water to provide water supply, and to protect the State Water Project (SWP) water quality within the California Aqueduct. To facilitate this policy DWR provides the following implementation process for accepting non-project water into the SWP (Policy). For purposes of this document, SWP and California Aqueduct are interchangeable and the same.

POLICY PROVISIONS

DWR shall consider and evaluate all requests for Non-Project (NP) water input directly into the SWP conveyance facilities based upon the criteria established in this document. NP water shall be considered to be any water input into the SWP for conveyance by the SWP that is not directly diverted from the Sacramento-San Joaquin Delta or natural inflow into SWP reservoirs.

The proponent of any NP water input proposal shall demonstrate that the water is of consistent, predictable, and acceptable quality.

DWR will consult with State Water Project (Contractors), existing NP participants and the Department of Public Health (DPH) on drinking water quality issues relating to NP water as needed to assure the protection of SWP water quality.

Nothing in this document shall be construed as authorizing the objectives of Article 19 of the SWP water supply contracts or DPH drinking water maximum contaminant levels to be exceeded.

This Policy shall not constrain the ability of DWR to operate the SWP for its intended purposes and shall not adversely impact SWP water deliveries, operation or facilities.

EVALUATING NP WATER PROPOSALS

DWR shall use a two-tiered approach for evaluating NP water for input into the California Aqueduct.

NP Tier 1

Tier 1 NP pump-in proposals (PIP) shall exhibit water quality that is essentially the same, or better, than what occurs in the California Aqueduct. PIP's considered to be tier 1 shall be approved by DWR (see baseline water quality tables 1 through 4).

NP Tier 2

Tier 2 PIP's are those that exhibit water quality that is different and possibly worse than in the California Aqueduct and/or have the potential to cause adverse impacts to the Contractors. Tier 2 PIP's shall be referred to a NP Facilitation Group (FG), which would review the project and if needed make recommendations to DWR in consideration of the PIP.

SWC Facilitation Group

This advisory group consists of representatives from each Contractor that chooses to participate and DWR. The group shall review tier 2 PIP's based on the merits, impacts, mitigation, water quality monitoring, cost/benefits or other issues of each PIP and provide recommendations to DWR. Upon initial review of tier 2 PIP by DWR, it shall then be submitted to the FG for review. A consensus recommendation from the FG would be sought regarding approval of the PIP. DWR shall base its decision on the merits of the PIP, recommendations of the FG and the PIP's ability to provide overall benefits to the SWP and the State of California.

Blending Water Sources

Blending of multiple water sources prior to inflow into the SWP is acceptable and may be preferred depending upon water quality of the PIP. Blending of water in this manner may be used to quality a project as NP Tier 1.

Mixing (blending) within the California aqueduct can be considered but shall not be adjacent to municipal and industrial (M&I) delivery locations. PIP's that are coordinating water discharged to maintain or improve SWP water quality are an example of the mixing approach. The PIP shall demonstrate by model or an approach acceptable to DWR and the FG that the water is adequately mixed before reaching the first M&I customer. Generally NP PIP's that involve mixing with SWP water shall be considered NP Tier 2.

Baseline Water Quality

To aid in developing and evaluating PIP's both historical and current SWP water quality levels shall be considered. A representative baseline water quality summary is shown in Tables 1 through 4, using historical SWP water quality records at O'Neill Forebay.

NP IMPLEMENTATION PROCESS

Project Proposals

The NP project proponent requesting to introduce water into the SWP shall submit a detailed PIP to DWR. The proponent shall demonstrate that the NP water is of consistent,
predictable and reliable quality, and is responsible for preparing and complying with any and all contracts, environmental documents, permits or licenses that are necessary consistent with applicable laws, regulations, agreements, procedures, or policies.

Project Description

The proponent will submit to DWR a PIP describing the proposed program, identifying the water source(s), planned operation, characterizing the inflow water quality and any anticipated impacts to SWP water quality and/or operations. The PIP should be submitted at least one month prior to proposed start up to allow for DWR and FG review. The PIP shall include:

- Project proponent names, locations, addresses, and contact person(s).
- Maps identifying all sources of water, point of inflow to the SWP and ultimate fate of the introduced water.
- Terms and conditions of inflow, timing, rates and volumes of inflow, pumping, conveyance and storage requirements.
- Construction details of any facilities located adjacent to the SWP including valves, meters, and pump and piping size.
- All potential impacts and/or benefits to downstream SWP water contractors.
- Detailed water quality data for all sources of water and any blend of sources that will be introduced into the SWP.
- Identify anticipated water quality changes within the SWP.
- Identify other relevant environmental issues such as subsidence, ground water overdraft or, presents of endangered species.
- Provide performance measures and remedial actions that will be taken in the event projected SWP water quality levels are not met.
- Reference an existing contract or indicate that one is in process with DWR to conduct a PIP.

Water Quality Monitoring

In order to demonstrate that the water source(s) are of consistent, predictable, and acceptable quality the NP proponent shall monitor water quality. The proponent shall, for the duration of the program, regularly report on operations as they affect water quality, monitoring data and water quality changes. Both DPH title 22 and a short list of Constituents of Concern (COC) shall be monitored for based upon one of the following water quality monitoring options.

Constituents of Concern Current COC are Arsenic, Bromide, Chloride, Nitrate, Sulfate, Organic Carbon, and Total Dissolved Solids. These COC's may be changed as needed.

Water Quality Monitoring Options NP proponents shall select one of the testing options below and perform all water quality testing and provide analytical results in a timely manner as described herein. Monitoring shall be conducted for initial well start-up, periodic well re-testing and on-going testing during operation. Well data should be no more than three years old. Title 22 results should be provided to DWR and the FG within two weeks of testing and COC results within one week of testing, unless other schedules are agreed upon by DWR and the FG.

Option 1 - Baseline tests for Individual Wells

Well Start-up: Title 22 tests are required for all wells participating in the program prior to start-up. An existing title 22 test that is no more than three years old may be used. A Title 22 test may be substituted for any well near a similar well with a Title 22 test of record.

Well Re-testing: Title 22 test for all wells participating every three years.

Ongoing Monitoring: COC tests are required for all discharge locations to the SWP at start up and quarterly thereafter for new programs and resumption of established programs. New programs or those with constituents that may potentially degrade the SWP shall conduct at least weekly COC sampling of all discharge locations until the proponent demonstrates that the NP water is of consistent, predictable and reliable quality. Once the nature of the discharge has been clearly established, the COC tests are required quarterly for each discharge point.

Option 2 - Baseline tests for Representative Wells

Well Start-up: COC tests of record are required for all wells participating in the program and Title 22 tests of record are required for representative wells comprising a subset of all wells. This would typically be a group of wells that are manifold together and discharge to one pipe. Representative wells shall be identified on a case-by-case basis to be representative of the manifold area, well proximity, and water levels.

Well Re-testing: Same as required in Option 1.

On-going Monitoring: COC tests are required for all discharge locations to the SWP at start up and monthly thereafter for the duration of the program and annually at each well. New programs or those with constituents that may potentially degrade the SWP shall conduct weekly COC sampling of all discharge locations until the proponent demonstrates that the NP water is of consistent, predictable and reliable quality.

Option 3 – Self Directed

A PIP may propose a water quality monitoring program for approval by DWR and the FG that is different from options 1 or 2. It must include COC and title 22 testing that will

fully characterize water pumped into the SWP and be at an interval to show a consistent, predictable and reliable quality.

Analytical Methods

Analytical laboratories used by project proponents shall be DPH certified by the Environmental Laboratory Accreditation Program (ELAP) and use EPA prescribed and ELAP accredited methods for drinking water analysis. Minimum Reporting Levels must be at least as low as the DPH required detection limits for purposes of reporting (DLR). The current DLRs are listed on the DPH website at Http://www.cdph.ca.gov/certlic/drinkingwater/Pages/MCLsandPHGs. DWR shall continue to use Bryte Chemical Laboratory as it's analytical and reference lab.

Flow Measurements

The project proponent shall maintain current, accurate records of water production rate and volume from each source, as well as, each point of discharge into the SWP. All flow measurements shall be submitted to regularly to DWR.

RECONSIDERATION

If an NP proponent disagrees with the FG or DWR decision or feels that there is an overriding benefit of the proposal, the proponent may request reconsideration from DWR on the basis of overriding public benefit or water supply deficiency. DWR shall consider these requests on a case-by-case basis.

ONGOING PROGRAM

Any NP Proponent who has successfully established a NP water inflow program (Including existing Kern Fan Banking Projects, Kern Water Bank, Pioneer and Berrenda Mesa Projects, Semitropic Water Storage District Wheeler Ridge Mariposa Water Storage District and Arvin Edison Water Storage District) may reinitiate the program by notifying DWR at least ten days before inflow is scheduled to begin and provide the following information:

- Updated water quality data and/or updated modeling that adequately reflects the quality of water to be introduced into the SWP.
- Turn-in location.
- Expected rate and duration of inflow. DWR shall notify the FG of this reinitiating of inflow.
- Water quality monitoring schedule that meets the objective of this policy.

FUTURE NP PROGRAMS

Future NP projects should be planned and designed considering the following items:

- Projects involving water quality exceeding primary drinking water standards shall show that the water shall be treated or blended before it enters the SWP to prevent water quality impacts.
- The project proponent of a Tier 2 proposal should clearly identify and establish that water inflow shall be managed and operated such that poor quality water will be blended with better quality water so that SWP water quality will not be degraded upon acceptable levels as determined by the FG and DWR.
- If a significant water supply deficiency exists and it is recommended by the FG that raw water quality criteria be set aside to ensure adequate supply, such action shall be subject to approval by the DPH.
- The project proponent of a NP inflow program which degrades SWP water quality shall identify mitigation to downstream water contractors for water quality impacts associated with increased water supply or treatment costs.

DWR ROLE

DWR shall seek, as needed, DPH or SWC recommendations on changes or additions to this document governing the NP water quality projects. The FG shall review proposed changes or additions prior to implementation by DWR, as needed.

DWR and or the United States Bureau of Reclamation (for San Luis Canal inflow) shall have ultimate responsibility for approving the water quality of all NP inflow, as well as, the oversight of monitoring and tracking the water quality of operating programs. DWR shall also ensure that the proponents of the NP inflow program perform according to their proposals, and will take appropriate action in the event of non-conformance.

Project Proposal Review Process

Upon receipt of a proposal for PIP, DWR shall review it for adequacy. DWR shall consider all PIPs based upon these guidelines. Review shall take no more than one month after receiving a complete program proposal. If necessary, DWR will convene timely meetings with the FG during the review. At a minimum the review will include

- Examination of all documents and data for completeness of the PIP.
- Notification of the affected Field Divisions, and the FG has been received by DWR.
- Consideration by DWR of comments from all parties before the final decision.
- Upon completion of the review DWR will notify the proponent and FG of the acceptance of the PIP or explain the reason(s) for rejecting it.
- DWR may reconsider a decision on a PIP based upon a recommendation from the FG. Reconsideration by DWR will be on a case-by-case basis.

Periodic Review

DWR may schedule periodic reviews of each operating NP inflow with input from the FG. As part of the review, program proponents shall provide the following information:

- Summary of deliveries to the Aqueduct.
- Water quality monitoring results.
- Proposed changes in the program operation.

The review may result in changes in monitoring and testing required of the program proponent as a result of;

- New constituents being added to the EPA /DPH list of drinking water standards.
- Changes in the maximum contaminant levels for the EPA/DPH list of drinking water standards.
- Identification of new constituents of concern.
- Changes in the water quality provided by the program.
- Changes in constituent background levels in the California Aqueduct.

This procedure shall recognize emerging contaminants and/or those detrimental to agricultural viability as they are identified by the regulatory agencies and shall set appropriate standards for water introduction based upon ambient levels in the California Aqueduct or State Notification Levels. Emerging contaminants are those that may pose significant risk to public health, but as yet do not have an MCL. Currently the Office of Environmental Health Hazard Assessment and the DPH establish Public Health Goals and Notification Levels, respectively. These levels, though not regulated, do provide health-based guidance to water utilities and can require public notification if exceeded.

Water Quality Review

DWR shall track and periodically report to the FG on water quality monitoring results on the SWP from NP water inflow and make all water quality data available to the public upon request.

- DWR shall review analyze and maintain all records of water quality testing conducted by the proponent of the well(s), source(s) and discharge(s) into the SWP.
- DWR shall determine what additional water quality monitoring, if any, is necessary within the SWP to ensure adequate protection of SWP water quality. DWR shall conduct all water quality monitoring within the SWP.
- DWR may prepare periodic reports of NP projects.

On-site Surveillance

The appropriate Field Division within DWR will be responsible for review and approval of all construction activities within the SWP right-of-way. Plans showing the discharge system piping, valves, sampling point, meters and locations must be submitted and approved prior to any construction. In addition, the appropriate Field Division will be responsible for confirmation of all meter readings and water quality monitoring conducted by the proponent.

- Field division staff may visit, inspect, and calibrate meters and measure flow conditions at each source or point of inflow into the SWP.
- Flow meters, sampling ports and anti-siphon valves must be conveniently located near the SWP right-of-way.
- Field division staff may collect water samples at each source or point of discharge into the SWP.
- The appropriate Field Division shall conduct additional water quality monitoring within the SWP, if deemed necessary, to assure compliance with the NP Inflow Criteria.
- DWR shall monitor aqueduct water quality and analyze several “split samples” of the water at the point of introduction into the aqueduct to ensure consistent analytical results.

Table A1 HISTORICAL WATER QUALITY CONDITIONS 1988 TO 2011 AT O'NEILL FOREBAY OUTLET (mg/L)

Parameter	Mean	Min.	Max.	Std. Dev.
Aluminum	0.03	0.01	0.527	0.05
Antimony	0.002	0.001*	0.005	0.002
Arsenic	0.002	0.001	0.004	0.001
Barium	0.05	0.05	0.068	0.002
Beryllium	0.001*	0.001*	0.001*	0.000
Bromide	0.22	0.04	0.54	0.16
Cadmium	0.003	0.001	0.005	0.002
Chromium	0.004	0.001	0.011	0.002
Copper	0.004	0.001	0.028	0.003
Fluoride	0.1	0.1	0.5	0.1
Iron	0.037	0.005	0.416	0.050
Manganese	0.009	0.005	0.06	0.007
Mercury	0.001	0.0002	0.001	0.0004
Nickel	0.001	0.001	0.004	0.0005
Nitrate	2.9	0.2	8.1	1.6
Selenium	0.001	0.001	0.002	0.0001
Silver	0.003	0.001	0.005	0.002
Sulfate	42	14	99	15
Total Organic Carbon	4.0	0.8	12.6	1.6
Zinc	0.007	0.005	0.21	0.01

*These values represent reporting limits. Actual values would be lower.

Table A2 O'Neill Forebay Outlet Total Dissolved Solids Criteria by Water Year Classification, 1988-2011 (mg/L)

Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet	227.2	262.5	295.4	228.9	213.8	231.2	184.4	226.5	181.5	171.4	195.7	157.3
Near Normal	317.9	324.7	351.7	295.4	268.1	302.7	270.0	285.1	230.1	211.9	170.9	202.6
Dry	286.4	319.6	370.0	362.0	344.2	305.2	240.4	278.2	307.3	234.8	269.0	336.6
Critical	256.6	312.9	372.9	367.0	361.0	335.0	307.1	291.8	335.1	325.7	339.4	328.8

* Year type is based on water year classification. Below normal and above normal year types have been combined into one designation called "near normal."

Table A3 O'Neill Forebay Outlet Bromide Criteria by Water Year Classification, 1988-2011 (mg/L)

Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet	0.19	0.24	0.28	0.13	0.10	0.12	0.12	0.17	0.12	0.12	0.13	0.10
Near Normal	0.31	0.31	0.34	0.21	0.15	0.15	0.18	0.22	0.15	0.15	0.14	0.19
Dry	0.25	0.29	0.35	0.35	0.24	0.20	0.17	0.24	0.27	0.13	0.29	0.41
Critical	0.26	0.28	0.32	0.37	0.33	0.27	0.22	0.22	0.28	0.28	0.32	0.37

* Year type is based on water year classification. Below normal and above normal year types have been combined into one designation called "near normal."

Table A4 O'Neill Forebay Outlet Total Organic Carbon Criteria by Water Year Classification, 1988-2011 (mg/L)

Year Type*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wet	2.8	2.9	3.9	5.2	4.8	3.8	3.9	3.4	3.1	3.2	3.1	2.7
Near Normal	3.7	4.1	4.0	7.0	6.3	5.6	4.7	4.4	4.0	3.3	3.3	3.4
Dry	3.0	3.0	4.0	5.7	4.8	5.7	4.5	3.6	3.7	2.9	2.9	2.7
Critical	2.8	3.1	3.3	4.9	6.0	5.7	4.7	4.0	3.8	3.9	4.0	3.5

* Year type is based on water year classification. Below normal and above normal year types have been combined into one designation called "near normal."

Appendix B. Monitoring of WWD Lateral 7 by Reclamation

Westlands Water District can pump water from the Mendota Pool to the San Luis Canal through Lateral 7. Reclamation will require special monitoring of this water while it is being pumped from WWD Lateral 7 into the canal. This will consist of weekly field measurements of salinity and turbidity, and collection of grab samples to measure a short list of constituents. After four consecutive weeks, the samples should be collected monthly for the duration of pumping.

Reclamation will ask for a full Title 22 analysis of the water in the lateral each year while pumping from the lateral into the canal occurs.

This monitoring may be modified by Reclamation to change the frequency of measurements and the range of parameters. Westlands will pay for the costs of sampling and analysis for this special monitoring program.

Reclamation may take field measurements and other samples of water from the canal upstream and downstream of the Lateral 7 discharge. Reclamation will pay for the sampling and analytical costs of these instream samples.

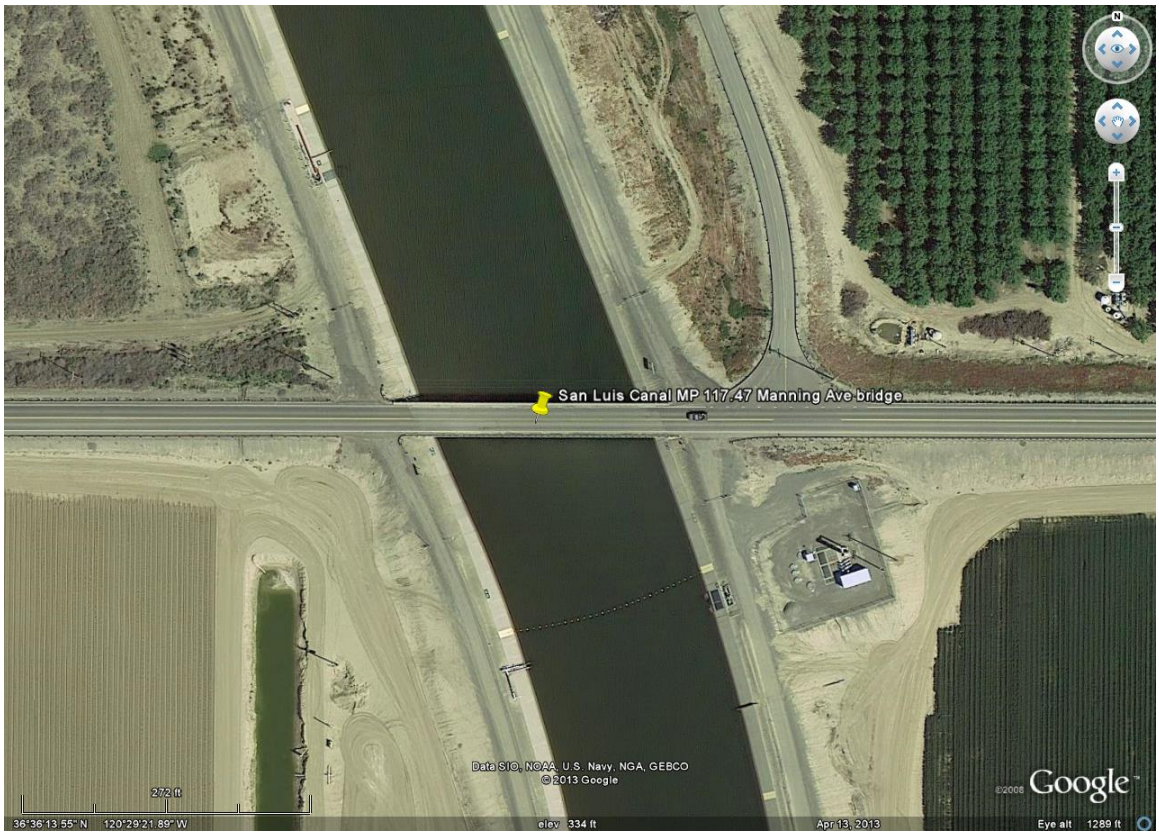
Location of Monitoring Sites

	Northing	Westing
San Luis Canal MP 113.82 Lincoln Ave bridge (upstream site)	36o38'50.72" N	120o31'26.37" W
WWD Lateral 7 at Adams Avenue	36o37'57.22" N	120o20'37.77" W
San Luis Canal MP 115.43L WWD Lateral 7 turnout structure	36o37’55.55” N	120o20’33.36” W
San Luis Canal MP 117.47 Manning Ave (downstream site)	36o36'43.68" N	120o29'22.54" W

San Luis Canal Milepost 113.82 – Lincoln Ave bridge (upstream sampling site)

Westlands Water District Lateral 7 at Adams Avenue

San Luis Canal MP 115.43L WWD Lateral7 turnout



San Luis Canal Milepost 117.47 – Manning Avenue (downstream sampling site)

Appendix C: Cultural Resources Determination

CULTURAL RESOURCES COMPLIANCE
Division of Environmental Affairs
Cultural Resources Branch (MP-153)

MP-153 Tracking Number: 17-SCAO-212

Project Name: Westlands Water District 5-year Warren Act Contract for Kings River Flood Flows in the San Luis Canal

NEPA Document: EA-17-023

NEPA Contact: Mary (Kate) Connor, Natural Resource Specialist

MP-153 Cultural Resources Reviewer: BranDee Bruce, Architectural Historian

Date: June 30, 2017

Reclamation proposes to approve a five year Warren Act contract with the Westlands Water District (WWD) for the conveyance of up to 50,000 acre feet (AF) per year of non-CVP water in the San Luis Canal beginning July 1, 2017 through June 30, 2022. The non-CVP water will be introduced at milepost (MP) 113.00 (Lateral 6-1) and/or MP 115.43 (Lateral 7-1), the water will be diverted into existing WWD turnouts (63 total), plus the Pleasant Valley Canal system and any approved existing temporary agricultural diversion used within the WWD Service Area. This proposed action is strictly a water transfer action and will not involve any new construction or ground-disturbing activities.

Reclamation determined that the proposed action is the type of undertaking that does not have the potential to cause effects on historic properties, should such properties be present, pursuant to 36 CFR § 800.3(a)(1). As such, Reclamation has no further obligations under 54 U.S.C. § 306108, commonly known as Section 106 of the National Historic Preservation Act (NHPA).

Reclamation cultural resources staff has reviewed the draft Environmental Assessment for this project and agrees the current language in the EA is sufficient for cultural resources analysis. No additional language will be provided.

This document conveys the completion of the cultural resources review and NHPA Section 106 process for this undertaking. The proposed action would have no impacts on cultural resources. Please retain a copy of this document with the administrative record for the proposed action. Should the proposed action change, additional review under Section 106, possibly including consultation with the State Historic Preservation Officer, may be required.

Appendix D: Water Quality Report Summary

US Bureau of Reclamation

Westlands Water District - 2017 Diversion of Kings River Flood water through WWD Lateral 7 to the San Luis Canal.

Sample: **Kings River Conveyance 7-2 Pumping Plant**

Location: **Lateral 7 intake canal, South Merced and Adams Avenue, near Tranquillity.**

36.632570, -120.642319

			Bromide	Chloride	Conductivity	Nitrate	Sulfate	TDS	Arsenic	Boron	Manganese	Selenium	pH	EC	DO	Turbidity	Temperature
		Method	300.1	300	SM2510b	300	300	SM2450c	200.8	200.7	200.7	200.8					
		MCL	TBD	250	1,692	45	600	1,100	10	2	0.05	50/2(*)					
		RL	0.0050	1.0	1.0	1.0	1.0	5.0	2.0	0.10	0.010	2.0					
Sample date	Lab	Units	mg/L	mg/L	umhos/cm	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	ug/L	units	uS/cm	mg/L	NTU	degrees C
3/9/2017	BSK	A7C0974	0.045	1.1	71	1.6	3.0	56	<2.0	<0.10	0.038	<2.0					
3/16/2017	BSK	A7C1743	<0.0050	1.1	73	1.4	2.9	55	<2.0	<0.10	0.033	<2.0					
3/23/2017	BSK	A7C2309	<0.0050	1.1	63	1.6	2.7	50	<2.0	<0.10	0.039	2.8 (*)					
3/30/2017	BSK	A7C2877	<0.0050	1.0	62	1.6	2.7	56	<2.0	<0.10	0.061	<2.0					
4/20/2017	BSK	A7D1921	<0.0050	<1.0	55	<1.0	2.1	50	<2.0	<0.10	0.041	<2.0					
4/20/2017	USBR	Field											7.17	59	10.61	NA	
5/18/2017	BSK	A7E2151	<0.0050	<1.0	39	<1.0	1.2	36	<2.0	<0.10	0.040	<2.0					
6/1/2017	USBR	Field											7.92	157	8.33	46.8	24.4
6/15/2017	BSK	A7F1705	<0.0050	<1.0	38	<1.0	1.8	46	<2.0	<0.10	0.037	<2.0					
6/22/2017	USBR	Field											7.12	42	8.08	70.2	24.03

Schedule: Weekly for four consecutive weeks, once per month for the duration of all pumping from Lateral 7 into the San Luis Canal

Constituents: Table 5b: Arsenic, Boron, Bromide, Nitrate (as NO3), Selenium, Chloride, Manganese, Specific Conductance, Sulfate, and Total Dissolved Solids.

Notes: (*) Selenium objective: Title 22 = 50 ug/L; Basin Plan for Grasslands wetlands channels = 2 ug/L monthly average.
Lateral 7 is not a Grasslands wetlands channel.

Sample: **San Luis Canal Milepost 117.47 Manning Avenue**

Sample date	Lab	Units	Bromide mg/L	Chloride mg/L	Conductivity umhos/cm	Nitrate mg/L	Sulfate mg/L	TDS mg/L	Arsenic ug/L	Boron mg/L	Manganese mg/L	Selenium ug/L	pH units	EC uS/cm	DO mg/L	Turbidity NTU	Temperature degrees C
6/22/2017	USBR	Field											7.42	134	8.27	21.8	25.05

US Bureau of Reclamation
Westlands Water District - 2017 Diversion of Kings River Flood water through WWD Lateral 7 to the San Luis Canal.

Location: CA Aqueduct, Ck 13, O'Neill Outlet (KA007089)

Sample date	Lab	Method / MCL / RL / Units	Bromide (dissolved) EPA 300.0 28d Hold	Chloride (dissolved) EPA 300.0 28d Hold	Specific Conductance (EC) Std Method 2510-B	Nitrate (dissolved) EPA 300.0 28d Hold	Sulfate (dissolved) EPA 300.0 28d Hold	TDS Std Method 2540 C	Arsenic (dissolved) EPA 200.8 (D)	Boron (dissolved) EPA 200.7 (D)	Manganese (dissolved) EPA 200.8 (D)	Selenium (dissolved) EPA 200.8 (D) 0.050/ 0.002(*)	pH EPA 150.1 (Field)	EC EPA 120.1 (Field)	DO EPA 360.2 (Field)	Turbidity EPA 180.1 (Field)	Temperature EPA 170.1 (Field)
		Method	Hold	Hold	2510-B	Hold	Hold	2540 C	(D)	(D)	EPA 200.8 (D)	(D) 0.050/ 0.002(*)	(Field)	(Field)	(Field)	(Field)	(Field)
		MCL	TBD	250	1,692	45	600	1,100	0.01	2	0.05						
		RL	0.01	1.0	1.0	0.1	1.0	1.0	0.001	0.1	0.005	0.001	0.1	1	0.2	0.1	0.1
Sample date	Lab	Units	mg/L	mg/L	umhos/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	units	uS/cm	mg/L	NTU	degrees C
10/18/2016	SWP	SL1016B0116	0.4	120	607	0.7	27.0	335	0.002	0.1	<0.005	0.001	7.4	583	8.6	3.9	18.7
11/15/2016	SWP	SL1116B0127	0.3	97	506	2.1	25	280	0.002	0.1	0.006	0.001	7.4	502	8.6	2.3	18.1
12/20/2016	SWP	SL1216B0138	0.42	139	709	3.4	40	399	0.002	0.2	0.011	0.002	7.2	679	10	5.1	9.9
1/17/2017	SWP	SL0117B0007	0.1	37.0	307	4.2	32	180	0.001	0.2	0.007	<0.001	7.2	306	8.8	30	11.5
2/14/2017	SWP	SL0217B0027	0.07	28.0	268	3.2	30	163	0.001	0.1	0.021	<0.001	7	265	8.6	20.3	14
3/14/2017	SWP	SL0317B0047	0.05	20.0	204	2	22	117	0.001	0.1	0.005	<0.001	7.3	207	9.1	15.1	15.5
4/18/2017	SWP	SL0417B0067	0.08	28.0	226	1.5	19	128	0.001	<0.1	0.007	<0.001	6.8	235	8.7	8.6	15.8
5/16/2017	SWP	P															
6/13/2017	SWP	P															

Schedule: Weekly for four consecutive weeks, once per month for the duration of all pumping from Lateral 7 into the San Luis Canal
Constituents: Table 5b: Arsenic, Boron, Bromide, Nitrate (as NO3), Selenium, Chloride, Manganese, Specific Conductance, Sulfate, and Total Dissolved Solids.
Notes: (*) Selenium objective: Title 22 = 50 ug/L; Basin Plan for Grasslands wetlands channels = 2 ug/L monthly average.
Lateral 7 is not a Grasslands wetlands channel.

Location: CALIFORNIA AQU NR KETTLEMAN CK-21 (KA017226)

Sample date	Lab	Method / MCL / RL / Units	Bromide (dissolved) EPA 300.0 28d Hold	Chloride (dissolved) EPA 300.0 28d Hold	Specific Conductance (EC) Std Method 2510-B	Nitrate (dissolved) EPA 300.0 28d Hold	Sulfate (dissolved) EPA 300.0 28d Hold	TDS Std Method 2540 C	Arsenic (dissolved) EPA 200.8 (D)	Boron (dissolved) EPA 200.7 (D)	Manganese (dissolved) EPA 200.8 (D)	Selenium (dissolved) EPA 200.8 (D) 0.050/ 0.002(*)	pH EPA 150.1 (Field)	EC EPA 120.1 (Field)	DO EPA 360.2 (Field)	Turbidity EPA 180.1 (Field)	Temperature EPA 170.1 (Field)
		Method	Hold	Hold	2510-B	Hold	Hold	2540 C	(D)	(D)	EPA 200.8 (D)	(D) 0.050/ 0.002(*)	(Field)	(Field)	(Field)	(Field)	(Field)
		MCL	TBD	250	1,692	45	600	1,100	0.01	2	0.05						
		RL	0.01	1.0	1.0	0.1	1.0	1.0	0.001	0.1	0.005	0.001	0.1	1	0.2	0.1	0.1
Sample date	Lab	Units	mg/L	mg/L	umhos/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	units	uS/cm	mg/L	NTU	degrees C
10/18/2016	SWP	SL1016B0111	0.4	121	603	0.3	26	333	0.002	0.1	<0.005	0.001	8.1	594	7.5	13	17.8
11/15/2016	SWP	SL1116B0122	0.34	105	542	2	26	303	0.002	0.1	<0.005	0.001	7.9	532	7.5	1.4	17.7
12/20/2016	SWP	SL1216B0133	0.38	124	644	2.5	34	360	0.002	0.2	<0.005	0.001	8.1	635	9.2	1.4	10.6
1/17/2017	SWP	SL0117B0002	0.11	40	304	3.1	27	181	0.001	0.1	<0.005	<0.001	7.5	298	9.1	20.5	9.5
2/14/2017	SWP	SL0217B0022	0.07	29	265	3.2	30	161	0.001	0.1	<0.005	<0.001	7.5	261	8.4	20.8	12.5
3/14/2017	SWP	SL0317B0041	0.05	20	209	2.2	22	117	0.001	0.1	<0.005	<0.001	7.5	203	8.13	13.4	14.5
4/18/2017	SWP	SL0417B0062	0.14	49	326	2	24	180	0.001	0.1	<0.005	<0.001	7.8	322	8.14	8.8	15
5/16/2017	SWP	p															
6/13/2017	SWP	p															