

# Appendix A – Water Quality Monitoring Plan

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## **APPENDIX A**

### **Water Quality Monitoring Plan For the Refuge Level 2 Exchange Agreement for Tertiary Treated Water Project**

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#### **BACKGROUND**

Panoche and San Luis Water Districts (Districts) would like to provide East Bear Creek Refuge (Refuge) up to 6,000 acre-feet (AF) for one year of tertiary-treated wastewater (Acquired Water) from Joseph Gallo Farms (Gallo Farms) to the Refuge. Acquired Water would be pumped and metered into Bear Creek at the Gallo Farms Point of Discharge and would be available for delivery to the Refuge from the East Bear Creek Pump Station located approximately 5 miles west in Bear Creek. Acquired Water would be blended with the existing water (if present) in Bear Creek which will have a varying flow rate over the course of the year and subsequently pumped onto Refuge land and used for the benefit of wildlife.

#### **MONITORING**

Monitoring flow rate and volume discharged: the discharge flow will be measured by a flow meter capable of recording instantaneous flow in cubic-feet per second and total flow in acre-feet.

Monitoring Water Quality: since a rigorous monitoring plan is already in place under the Waste Discharge Board Order for the tertiary-treated wastewater delivered to Gallo Farms, sampling for this Water Quality Monitoring Plan (Plan) focuses on actual water delivered to Bear Creek and the Refuge. Therefore, water quality monitoring will consist of monthly grab samples at the Point of Discharge to Bear Creek and also at the East Bear Creek Pump Station. In addition, prior to the commencement of the project, Contaminants of Emerging Concern (CEC's) will be tested for background concentrations at the City of Atwater's discharge point and at the East Bear Creek Refuge Pump Station (see Table 2).

The grab samples will be evaluated in the field for Electronic Conductivity (EC), pH, and Temperature. Furthermore, the grab samples will also be analyzed for the constituents of primary concern (Table 1) by a Reclamation-approved laboratory. The Reclamation-approved laboratory used shall provide a method Reporting Limit (RL) in accordance with Table 1. In addition to the monthly grab samples, at the commencement of discharging, the Acquired Water will be tested for Methyl Mercury with a set threshold of 0.06 ng/L. Methyl Mercury will only be tested for once as outlined in Table 2.

**Table 1 – Constituents of Primary Concern**

Analyte	Water Quality Threshold	Desired Method Reporting Limit (RL)
Selenium (µg/L)	Not to exceed 2	0.4
Boron (mg/L)	4	0.1
Total Dissolved Solids (mg/L)	-	10
Specific Conductance (µs/cm)	1,000	10
Aluminum (ug/L)	87	-
Arsenic (ug/L)	100	-
Beryllium (ug/L)	100	-
Cadmium (ug/L)	1.1	-
Chloride (mg/L)	106	-
Chromium III (ug/L)	84	-
Cobalt (ug/L)	50	-
Copper (ug/L)	4.1	-
Fluoride (mg/L)	1	-
Iron (ug/L)	1,000	-
Lead (ug/L)	0.92	-
Manganese (ug/L)	200	-
Mercury (ug/L)	0.77	-
Molybdenum (ug/L)	10	-
Nickel (ug/L)	24	-
Nitrate + Nitrite as N (ug/L)	10,000	-
pH	6.5-8.4	-
Silver (ug/L)	0.71	-
Sodium (ug/L)	-	-
Specific Conductance (ug/L)	1,000	-
Zinc (ug/L)	54	-

In addition to the constituents of primary concern (Table 1), monitoring will also include constituents of emerging concern (CEC) (Table 3). These constituents are specifically being added due to concerns related to the unique source water (tertiary treated municipal wastewater). Prior to the commencement of the Project, CEC's (Table 3) will be tested for at the City of Atwater's discharge to the Peck Drain and at the East Bear Creek Pump Station intake from Bear Creek (if flow exists in Bear Creek adjacent to the

Refuge Pump Station). Upon commencement of the Project, the water at the discharge point to Bear Creek and the East Bear Creek Pump Station will be tested for the constituents listed in Tables 1 and 3. If it is found that the CEC's are not impacting the water quality considered acceptable for the Refuge, the testing for the CEC's (Table 3) will continue quarterly at the East Bear Creek Pump Station and the discharge point to Bear Creek. However, if any of the constituents emerge, more frequent monitoring may be enacted.

**Table 2 Water Quality Monitoring Parameters and Sampling Schedule**

Sample Constituents and Frequency					
Location	Flow Rate	EC, Temp, pH	Methyl Mercury	Constituents of Primary Concern (Table 1)	Constituents of Emerging Concern (CEC) (Table 3)
City of Atwater discharge to Peck Drain					Once prior to Project commencement
Gallo Farms Point of Discharge	Continuous	Weekly	Once Initially	Monthly	Quarterly –Full list first then quarterly review
East Bear Creek Pump Station	Continuous (Refuge)	Weekly	-	Monthly	* Once prior to Project commencement then Quarterly –Full list first then quarterly review
* The sample at the Refuge Pump Station may not be collected prior to Project commencement if sufficient flow does not exist exists in Bear Creek adjacent to the Refuge Pump Station.					

As soon as practical (generally within 7 days of receipt of information from the water quality testing laboratory), the Districts will ensure that Reclamation receives electronic copies of the complete data reports submitted by the laboratory. The Districts will also provide a monthly water quality summary report, including volumetric data on water deliveries, within 60 days of sample collection.

### MITIGATION MEASURES

The mitigation measures will ensure that the water supply developed during this Proposed Action will not significantly adversely impact water quality delivered to the Refuge. If monitoring indicates that threshold values are exceeded in Table 1 or there is

a concern with the levels of CEC's (Table 3) the following mitigation measures will be implemented within 24 hours:

1. Participating parties will determine options for improving water quality such as:
  - a. Curtail or reduce Gallo Farms deliveries to Bear Creek.
  - b. Modulate Gallo Farms deliveries to maximize blending with other water in Bear Creek to reduce constituent concentrations to below thresholds (Table 1) at the East Bear Creek Pump Station.
  - c. Numeric thresholds for most the CEC's in Table 3 do not exist. Acceptance of Acquired Water may be eliminated if there is a concern for the concentration of one or more of the CEC's delivered to the Refuge and such concentration of one or more of the CEC's are shown to be originating from the Acquired Water.
2. Compare water quality test results from the Gallo Farms Point of Discharge and East Bear Creek Pump Station.
  - a. The discharge of Acquired Water could also be allowed to continue if the Acquired Water provides dilution to the water in Bear Creek as measured at the East Bear Creek Pump Station and upon written concurrence of the parties.

#### FIELD QUALITY ASSURANCE CHECKS

Reclamation will add periodic quality assurance checks by collecting field samples concurrently with staff from the Parties. Samples collected by Reclamation would be sent separately to a Reclamation approved laboratory for an independent quality assurance check. Costs related to Reclamation's quality assurance checks will be paid for by Reclamation.

## ADDITIONAL METALS, NUTRIENTS AND CEC'S FOR WATER QUALITY TESTING

**Table 3 - CEC List (Eurofins, Eaton  
Analytical test #DX\_ABI\_EDC)**

2,4-D	Androstenedione
4-nonylphenol - semi quantitative	Atenolol
4-tert-octylphenol	Atrazine
Acesulfame-K	Azithromycin
Bendroflumethiazide	Bezafibrate
BPA	Bromacil
Butalbital	Caffeine
Butylparben	Carbadox
Chloramphenicol	Carbamazepine
Clofibric Acid	Carisoprodol
Diclofenac	Chloridazon
Estradiol	Chlorotoluron
Estrone	Cimetidine
Ethinyl Estradiol - 17 alpha	Cotinine
Ethylparaben	Cyanazine
Gemfibrozil	DACT
Ibuprofen	DEA
Iohexal	DEET
Iopromide	Dehydronifedipine
Isobutylparaben	DIA
Methylparaben	Diazepam
Naproxen	Dilantin
Propylparaben	Diltiazem
Sucralose	Diuron
Triclocarban	Erythromycin
Triclosan	Flumequine
Warfarin	Fluoxetine
1,7-Dimethylxanthine	Isoproturon
Acetaminophen	Ketoprofen
Albuterol	Ketorolac
Amoxicillin (semi- quantitative)	Lidocaine
	Lincomycin
	Linuron
	Lopressor

Meclofenamic Acid  
Meprobamate  
Metazachlor  
Metolachlor  
Nifedipine  
Norethisterone  
OUST  
(Sulfameturon,methyl)  
Oxolinic acid  
Pentoxifylline  
Phenazone  
Primidone  
Progesterone  
Propazine  
Quinoline  
Simazine  
Sulfachloropyridazine

Sulfadiazine  
Sulfadimethoxine  
Sulfamerazine  
Sulfamethazine  
Sulfamethizole  
Sulfamethoxazole  
Sulfathiazole  
TCEP  
TCPP  
TDCPP  
Testosterone  
Theobromine  
Theophylline  
Thiabendazole  
Trimethoprim