

Monitoring Results

Quarterly Review

April 2012 – June 2012

Sacramento Valley Archetypes

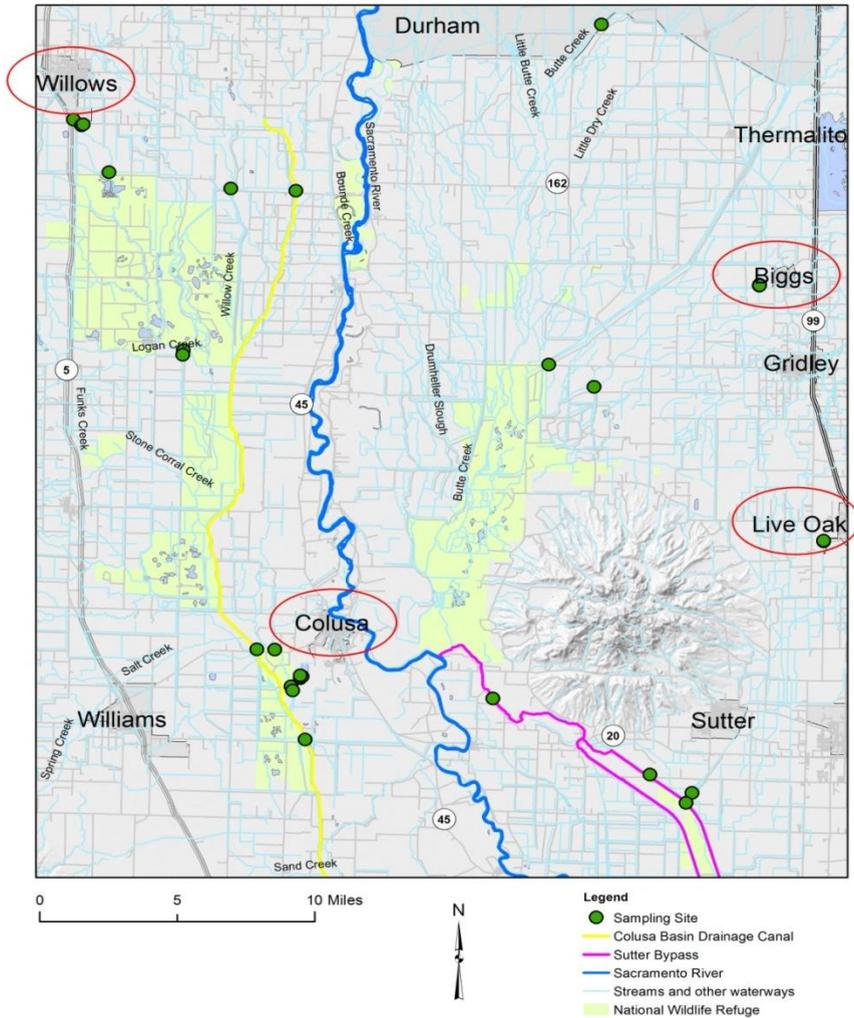
Westside: Willows, Colusa

Eastside: Biggs, Live Oak



Calvin Yang

MUN Beneficial Use Study - Site Map



All Effluent and Receiving Water Sites

Parameter	Frequency	Number of Samples with Exceedances (Total Samples)
Aluminum	1/month	65 (89)
Arsenic	1/month	10 (89)
Iron	1/month	71 (89)
Manganese	1/month	71 (89)
MBAS	1/month	0 (89)
Nitrate as N	1/month	13 (89)
Nitrite as N	1/month	0 (72)
Hardness	1/month	(30)
Boron	1/month	1 (89)
Sodium	1/month	71 (89)
Bromoform	1/month	0 (89)
Chloroform	1/month	2 (89)
Bromodichloromethane	1/month	3 (89)
Dibromochloromethane	1/month	2 (89)
Conductance	2/month	34 (205)
Turbidity	2/month	(205)
pH	2/month	6 (205)
photos	2/month	(833)
DO	2/month	(205)
Temperature	2/month	(205)

Effluent Sites Only (1/quarter)

Parameter	Number of Samples with Exceedances (Total Samples)	Criteria
Dioxin	0 (4)	1.3 E-08 µg/L
Organo-Phosphorus Pesticide Scan	0 (4)	Various
Organo-Chlorinated Pesticide Scan	0 (4)	Various
Semi-volatiles Scan	0 (4)	Various
Chlorinated Herbicide Scan	0 (4)	Various
Polychlorinated Biphenyls	0 (4)	0.00017 µg/L
Carbamate Pesticide Scan	0 (4)	Various
Antimony, Chloride, Fluoride, Sulfate, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Thallium, Zinc	0 (4)	Various
Ammonia as N	1 (4)	1.5 mg/L
Total Dissolved Solids	4 (4)	500 - 1,000 mg/L

Colusa Exceedances (April – June)

Site	Number of Samples with Exceedances (Total Samples)								
	Aluminum	Iron	Manganese	Arsenic	Sodium	TDS	Conductivity	Nitrate as N	Ammonia as N
Criteria:	200 µg/L	300 µg/L	50 µg/L	10 µg/L	20 mg/L	500 mg/L	900 µS/cm	10 mg/L	1.5 mg/L
Colusa Basin Drain at Highway 20	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (7)	0 (3)	
Powell Slough at Highway 20	2 (3)	3 (3)	3 (3)	0 (3)	3 (3)		2 (7)	0 (3)	
New Ditch	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		5 (6)	0 (3)	
Unnamed Tributary, Upstream of Discharge	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		5 (7)	0 (3)	
Effluent	0 (3)	0 (3)	0 (3)	0 (3)	3 (3)	1 (1)	5 (7)	3 (3)	0 (1)
Unnamed Tributary, Downstream of Discharge	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		5 (7)	1 (3)	
Powell Slough, Upstream of Unnamed Tributary	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		3 (7)	0 (3)	
Powell Slough, Downstream of Unnamed Tributary	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		6 (7)	0 (3)	
Colusa Basin Drain at Abel Road	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (8)	0 (3)	

Willows Exceedances (April – June)

Site	Number of Samples with Exceedances (Total Samples)											
	Aluminum	Iron	Manganese	Arsenic	Sodium	TDS	Conductivity	Nitrate as N	Ammonia as N	Chloroform	Bromodichloro methane	Dibromochloro methane
Criteria:	200 µg/L	300 µg/L	50 µg/L	10 µg/L	20 mg/L	500 mg/L	900 µS/cm	10 mg/L	1.5 mg/L	5.7 µg/L	0.56 µg/L	0.41 µg/L
Ag Drain C, Upstream of Discharge	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (7)	0 (3)		0 (3)	0 (3)	0 (3)
Effluent	0 (3)	0 (3)	0 (3)	0 (3)	3 (3)	1 (1)	0 (7)	3 (3)	0 (1)	2 (3)	3 (3)	2 (3)
Ag Drain C, Downstream of Discharge	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (7)	0 (3)		0 (3)	0 (3)	0 (3)
Ag Drain C at Road 60	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (7)	0 (3)		0 (3)	0 (3)	0 (3)
Willow Creek at Road 61	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (7)	0 (3)		0 (3)	0 (3)	0 (3)
Colusa Basin Drain at Road 61	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (7)	0 (3)		0 (3)	0 (3)	0 (3)
Logan Creek, Downstream of Effluent	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (7)	0 (3)		0 (3)	0 (3)	0 (3)
Hunters Creek, Downstream of Effluent	3 (3)	3 (3)	3 (3)	0 (3)	3 (3)		0 (7)	0 (3)		0 (3)	0 (3)	0 (3)

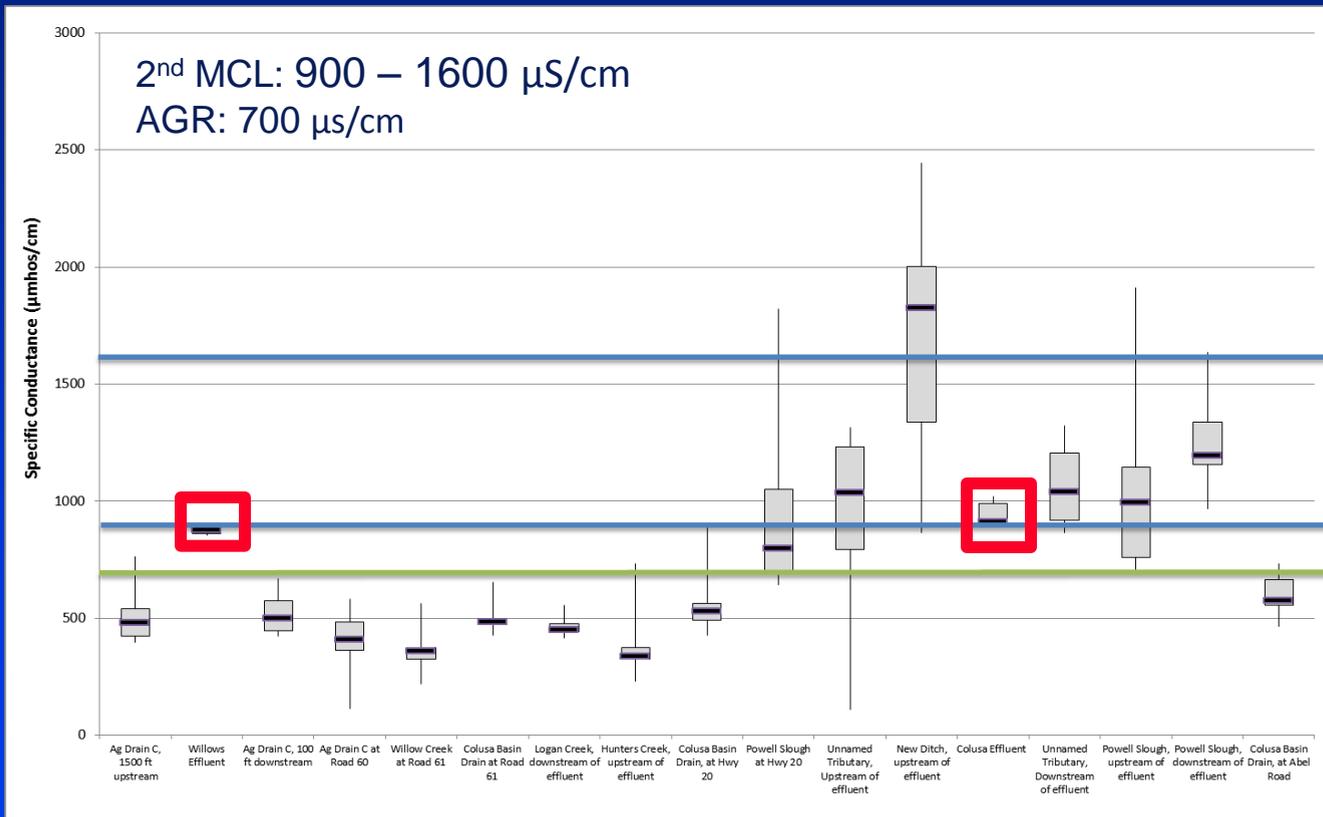
Live Oak Exceedances (April – June)

Site	Number of Samples with Exceedances (Total Samples)								
	Aluminum	Iron	Manganese	Arsenic	Sodium	TDS	Conductivity	Nitrate as N	Ammonia as N
Criteria:	200 µg/L	300 µg/L	50 µg/L	10 µg/L	20 mg/L	500 mg/L	900 µS/cm	10 mg/L	1.5 mg/L
Lateral #2, Upstream of Discharge	2 (3)	2 (3)	3 (3)	2 (3)	3 (3)		1 (6)	1 (3)	
Effluent	0 (3)	0 (3)	0 (3)	3 (3)	3 (3)	1 (1)	1 (6)	3 (3)	0 (1)
Lateral #2, Downstream of Discharge	0 (3)	0 (3)	1 (3)	3 (3)	3 (3)		1 (6)	2 (3)	
Wadworth Canal, Downstream of Effluent	3 (3)	3 (3)	3 (3)	0 (3)	2 (3)		0 (6)	0 (3)	
Sutter Bypass, Upstream of Effluent	3 (3)	3 (3)	3 (3)	0 (3)	1 (3)		0 (6)	0 (3)	
Sutter Bypass, Downstream of Effluent	3 (3)	3 (3)	3 (3)	0 (3)	1 (3)		0 (6)	0 (3)	

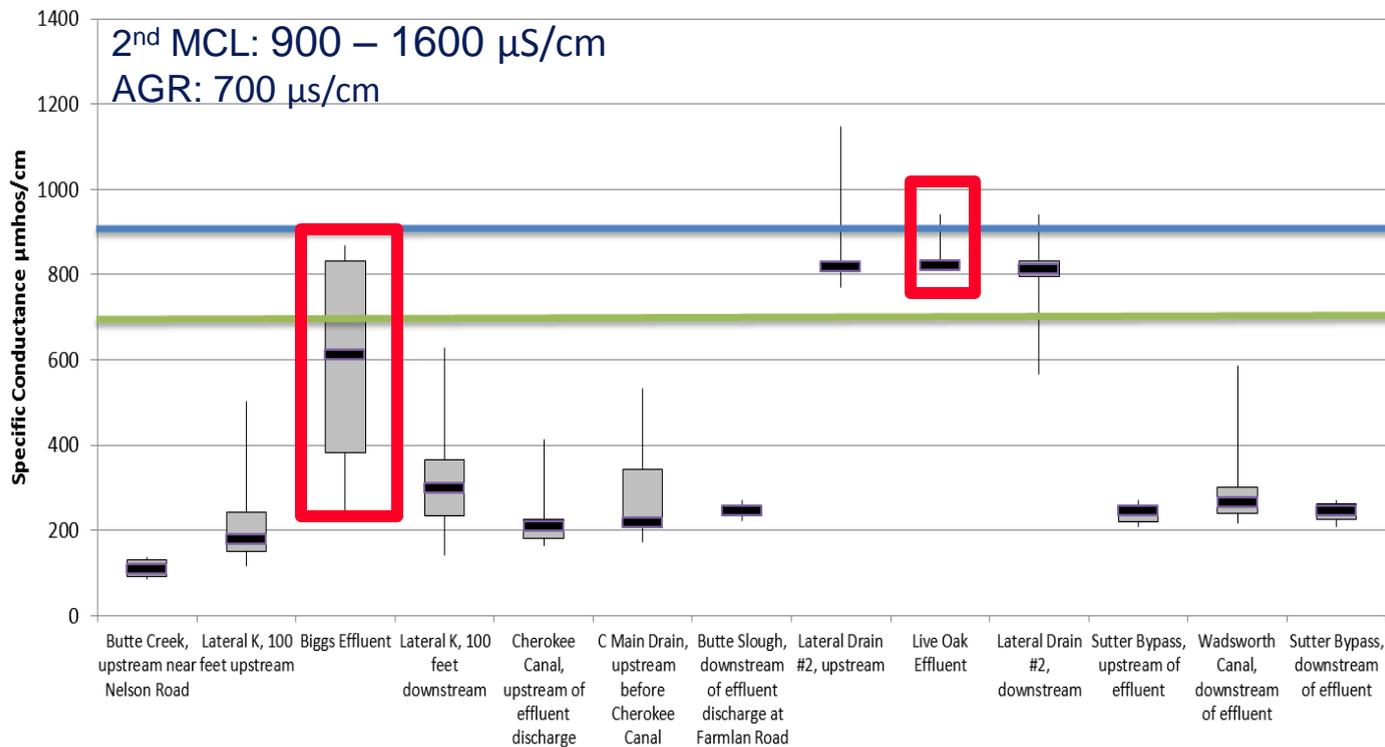
Biggs Exceedances (April – June)

Site	Number of Samples with Exceedances (Total Samples)								
	Aluminum	Iron	Manganese	Arsenic	Sodium	TDS	Conductivity	Nitrate as N	Ammonia as N
Criteria:	200 µg/L	300 µg/L	50 µg/L	10 µg/L	20 mg/L	500 mg/L	900 µS/cm	10 mg/L	1.5 mg/L
Butte Creek near Nelson Road	0 (3)	0 (3)	0 (3)	0 (3)	0 (3)		0 (7)	0 (3)	
Lateral K, Upstream of Discharge	3 (3)	3 (3)	3 (3)	0 (3)	1 (3)		0 (7)	0 (3)	
Effluent	0 (3)	1 (3)	0 (3)	0 (3)	3 (3)	1 (1)	0 (7)	0 (3)	1 (1)
Lateral K, Downstream of Discharge	3 (3)	3 (3)	3 (3)	0 (3)	2 (3)		0 (7)	0 (3)	
C Main Drain, Upstream of Cherokee Canal	3 (3)	3 (3)	3 (3)	0 (3)	1 (3)		0 (7)	0 (3)	
Cherokee Canal, Upstream of Effluent	3 (3)	3 (3)	2 (3)	0 (3)	0 (3)		0 (7)	0 (3)	
Butte Slough at Farmlan Road	2 (2)	2 (2)	2 (2)	0 (3)	1 (2)		0 (6)	0 (3)	

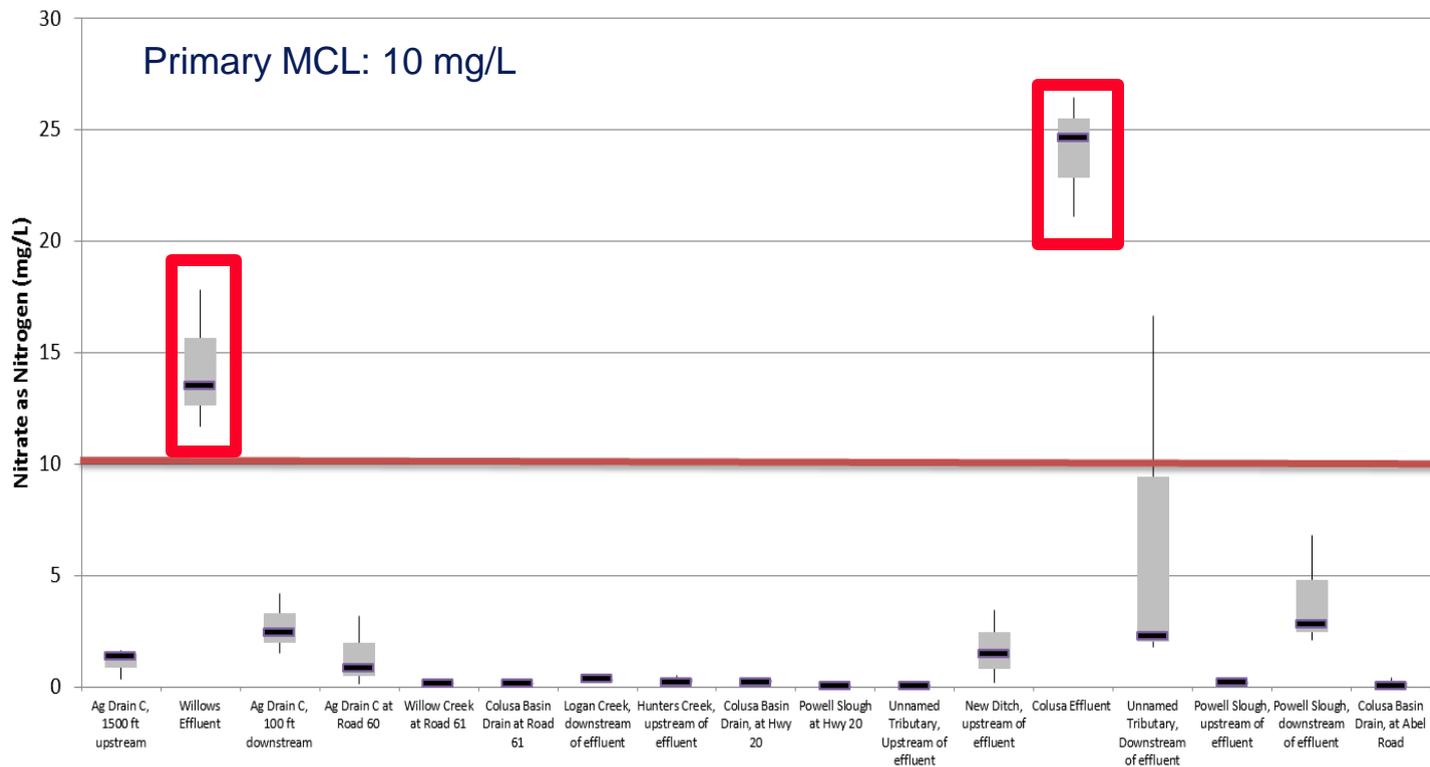
West Side – Specific Conductance (April – July)



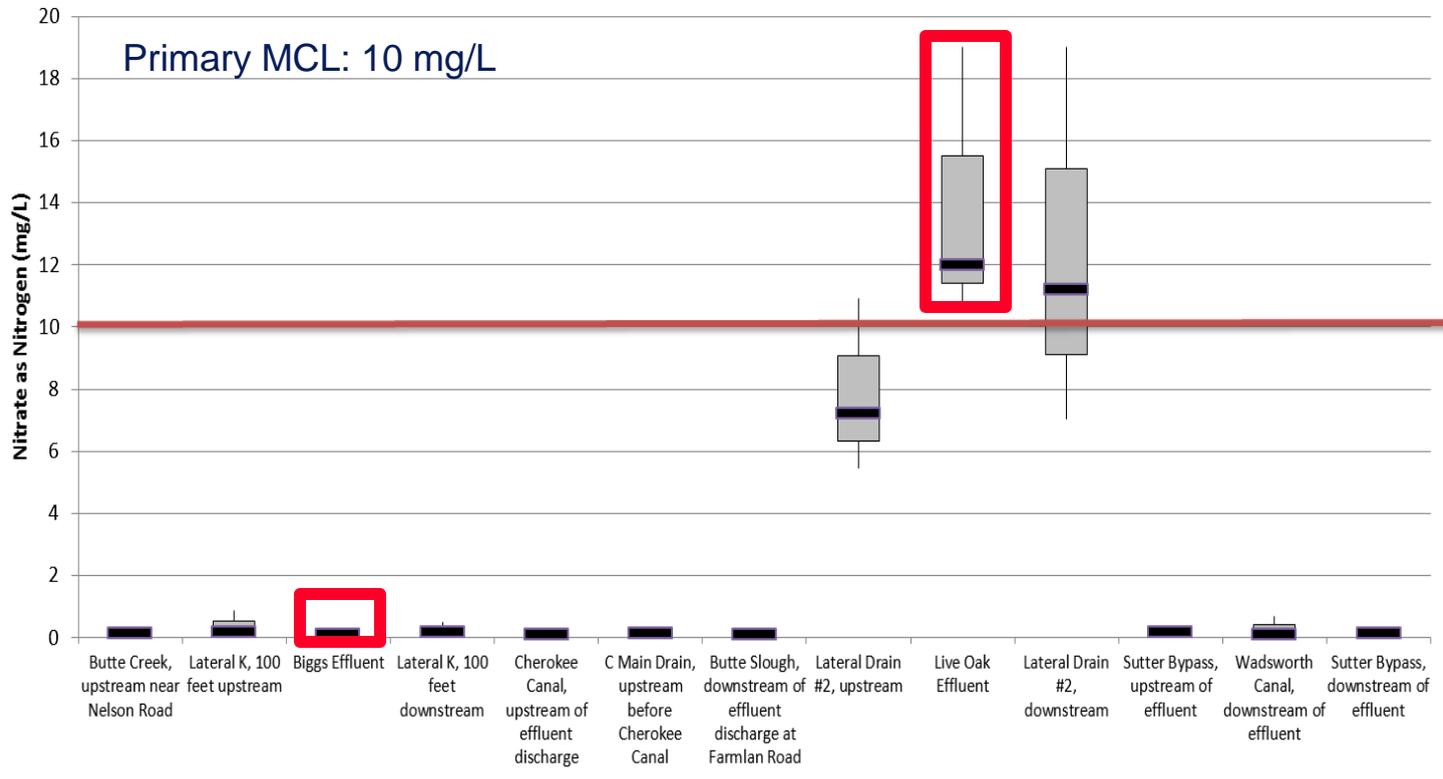
East Side – Specific Conductance (April – July)



West Side – Nitrate as Nitrogen (April – June)



East Side – Nitrate as Nitrogen (April – June)



New Ditch (Colusa Area)

Median Conductivity: 1825 $\mu\text{S}/\text{cm}$



Lateral #2 Downstream (Live Oak Area)

Median Nitrate: 11.2 mg/L



Effluent into Lateral K (Biggs Area)

April
19



May
24



June
26



August 9, 2012

Ag Drain C Downstream (Willows Area)

Chloroform, Dibromochloromethane and
Chlorodibromomethane below criteria



August 9, 2012

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Summary of Exceedances

Parameter	Colusa			Willows			Live Oak			Biggs		
	Upstream	Effluent	Downstream									
Aluminum	X		X	X		X	X		X	X		X
Iron	X		X	X		X	X		X	X	X	X
Manganese	X		X	X		X	X		X	X		X
Arsenic							X	X	X			
Sodium	X	X	X	X	X	X	X	X	X	X	X	X
TDS		X			X			X			X	
Conductivity	X	X	X				X	X	X			
Nitrate		X	X		X		X	X	X			
Ammonia											X	
Chloroform					X							
Bromodichloromethane					X							
Dibromochloromethane					X							

Adjustments Needed?

- Continue sampling only for parameters with exceedances?
- Increase/decrease frequency of parameters?
- Should a parameter only be sampled on west or east side?
- Adding total coliform and *E.coli* sampling 2/month

Monitoring Costs

July 2012 – June 2013

- Current Program = \$70,000
- Water Boards: \$30,000*
 - *Lab Budget subject to change based Office Needs
- Comments will be brought to CV-SALTS TAC

Constituent	Test Method	Cost
Key Constituents (Monthly sampling)		
Boron	200.8	\$ 5.00
Sodium	200.8	\$ 5.00
Nitrate	300	\$ 7.00
Arsenic	1639	\$ 8.00
Volatile Organic Compound & Oxygenated Additive Scan (This scan includes Total Trihalomethanes)	8260B	\$ 60.00
Aluminum	200.8	\$ 5.00
Iron	200.8	\$ 5.00
Manganese	200.8	\$ 5.00
MBAs	5540C	\$ 20.00
Hardness	Calculated	\$ 10.00
Total per Site:		\$ 130.00
Total per Month (30 Sites):		\$ 3,900.00
QA Samples per Month (6.5%):		\$ 253.50
Total per Month (30 Sites + QA):		\$ 4,153.50
Total for 30 Sites for 12 months:		\$ 49,842.00
Inorganic Chemical Scan (Seasonal sampling - Once every 3 months)		
Antimony, Barium, Cadmium, Chromium, Nickel, Thallium, Copper, Silver, Zinc	200.8	\$ 50.00
Lead	1638	\$ 35.00
Total Dissolved Solids	2540C	\$ 7.00
Ammonia	4500-NH3	\$ 25.00
Chloride	300	\$ 7.00
Sulfate	300	\$ 10.00
Fluoride	300	\$ 10.00
Selenium	200.9/1639	\$ 8.00
Total per Site:		\$ 152.00
Total per Season (4 Sites):		\$ 608.00
QA Samples per Season (6.5%):		\$ 39.52
Total per Season (4 Sites + QA):		\$ 647.52
Total for 4 seasons:		\$ 2,590.08
Organic (Non-Volatile Synthetic Organic Chemicals) Chemical Scan (Seasonal sampling - Once every 3 months)		
Organo-Chlorinated Pesticide	8081A	\$ 60.00
Gas Chromatography/Mass Spectrometer (GC/MS) Semivolatiles	8270C	\$ 95.00
Chlorinated Herbicide	8151A	\$ 60.00
Organo-Phosphorus Pesticide	8141A	\$ 60.00
Polychlorinated Biphenyls (PCB's)	8082A	\$ 60.00
Poly-Chlorinated-Dibenzo-p-Dioxin/Furan High Resolution Mass Spectrometer (HRMS)	8290	\$ 500.00
Carbamate Pesticide	8318	\$ 125.00
Total per Site:		\$ 960.00
Total per Season (4 Sites):		\$ 3,840.00
QA Samples per Month (6.5%):		\$ 249.60
Total per Season (4 Sites + QA):		\$ 4,089.60
Total for 4 seasons:		\$ 16,358.40
Grand Total for Key Constituents and All Scans:		\$ 68,790.48