

ATTACHMENT 7.2B

# Licensee's 2009 Water Quality

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## 1.0 Surveys

In 2009, Yuba County Water Agency (YCWA or "Licensee") collected 35 surface water samples in stream reaches and reservoirs potentially affected by YCWA's Yuba River Development Project (Project) and monitored dissolved oxygen for 18 days downstream of Project facilities, United States Army Corp of Engineers' (USACE) facilities, and non-Project diversions. Starting on September 5 and completed by October 7, data collection was conducted within the summer low-flow season when Project effects might be expected to be most pronounced.

Of the 35 surface water samples collected, 17 were gathered from locations upstream, downstream and within New Bullards Bar Reservoir and USACE's Englebright Reservoir, as well as four locations downstream of the Project towards the Yuba River's confluence with the Feather River. The remaining 18 samples were collected near reservoir recreation facilities on and around the Labor Day holiday period and were analyzed for bacteria and hydrocarbons. Concurrent with surface water sample collection, dissolved oxygen was continuously monitored for 18 days downstream of New Bullards Bar, Colgate Powerhouse, Narrows 2 Powerhouse, and USACE's Daguerre Point Dam.

Licensee's 2009 water quality sample collection, analysis and results are summarized in the attached tables, Tables 7.2B-1 through 7.2B-7:

Table 7.2B-1	2009 Reservoir and stream reach sampling locations.
Table 7.2B-2	Water quality parameters and associated methods, reporting limits and laboratory holding times.
Table 7.2B-3	Standards, criteria and benchmarks used for determining consistency with Basin Plan Objectives and designated beneficial uses of water in project reservoirs and project-affected stream reaches.
Table 7.2B-4	2009 Sample-specific hardness dependent freshwater aquatic life criteria.
Table 7.2B-5	2009 Reservoir and stream reach sample results.
Table 7.2B-6	2009 Bacteria and Total Petroleum Hydrocarbon (TPH) sample results.
Table 7.2B-7	2009 Average daily dissolved oxygen downstream of Project facilities, USACE facilities, and non-Project diversions for 18 days.

Copies of Tables 7.2B-5 through 7.2B-7 are also available in Excel format from Licensee upon request. Detailed maps of the Project Area<sup>1</sup> are provided in Appendix D.

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<sup>1</sup> The Project Area was defined as the area within the Federal Energy Regulatory Commission (FERC) Project Boundary and the land immediately surrounding the FERC Project Boundary (i.e., within about 0.25 mile of the FERC Project Boundary) and included Project-affected reaches between facilities and downstream to the next major water controlling feature or structure, the United States Army Corps of Engineers' (USACE) Daguerre Point Dam.

## 2.0 References

- American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF). 2010. Standard Methods for the Examination of Water and Wastewater. 21<sup>st</sup> edition. Washington, D.C.  
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- California Department of Public Health (CDPH). 2010. California Code of Regulations, Title 22, Division 4, Chapter 15, Domestic Water Quality and Monitoring Regulations.  
<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Lawbook.aspx>
- Central Valley Regional Water Quality Control Board (CVRWQCB). 1998. The Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin. 4<sup>th</sup> edition. California Regional Water Quality Control Board, Central Valley Region. Revised in September 2009 with the Approved Amendments.  
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- \_\_\_\_\_. 2010b. Clean Water Act Analytical Methods.  
<http://water.epa.gov/scitech/swguidance/methods/index.cfm>

**Table 7.2B-1 2009 reservoir and stream reach sampling locations.**

Stream Reach	Study element			Sample Depth	Location	Notes
	Water Chemistry Sample <sup>1,2</sup>	Bacteria and TPH Sample <sup>1</sup>	Dissolved Oxygen 18-day Monitoring <sup>3</sup>			
<b>MIDDLE YUBA RIVER</b>						
--	X	--	--	Surface	Above Our House Dam Diversion	Immediately upstream of the impoundment; SYRCL sampling Site
Our House Diversion Dam Reach	X	--	--	Surface	Below Our House Dam Diversion	Immediately downstream of dam
<b>OREGON CREEK</b>						
--	X	--	--	Surface	Above Log Cabin Diversion Dam	Immediately upstream of the impoundment and above inflow from tunnel
Log Cabin Diversion Dam Reach	X	--	--	Surface	Below Log Cabin Diversion Dam	Immediately downstream of dam
<b>NORTH YUBA RIVER</b>						
--	X	--	--	Surface	Below Fiddle Creek at Highway 49 <sup>1</sup>	In flowing water upstream of New Bullards Bar; SYRCL Sampling Site
New Bullards Bar Reservoir	--	X	--	Surface	In-reservoir, upstream of both boat ramps	Non-recreation site for bacteria sampling comparisons
	--	X	--	Surface	Emerald Cove Near the Boat Ramp	--
	--	X	--	Surface	Dark Day Cove Near the Boat Ramp	--
	X	--	--	Surface	One Site Near Dam	--
	X	--	--	Bottom		--
New Bullards Bar Dam Reach	X	--	X	Surface	Below New Bullards Bar Dam	--
<b>YUBA RIVER</b>						
Colgate Powerhouse Reach	X	--	X	Surface	Below Colgate Powerhouse	--
USACE's Englebright Reservoir	X	--	--	Surface	One Site Near Dam	--
	X	--	--	Bottom		--
<b>SOUTH YUBA RIVER</b>						
--	X	--	--	Surface	South Yuba River State Park – South Yuba River upstream of Englebright high-water line	SYRCL's Bridgeport sampling site
<b>YUBA RIVER</b>						
Narrows 2 Powerhouse Reach	X	--	X	Surface	Narrows 2 Tailrace/ Downstream of USACE's Englebright Dam	--
--	X	--	--	Surface	Downstream of Deer Creek confluence; at Highway 20	SYRCL Sampling Site
Daguerre Point Dam Reach	X	--	X	Surface	Downstream of USACE's Daguerre Point Diversion Dam	SYRCL Sampling Site
	X	--	--	Surface	At Walnut Avenue	--
	X	--	--	Surface	Marysville	SYRCL Sampling Site

<sup>1</sup> Water samples were grab samples collected for laboratory analysis; stream samples were collected from the moving water.

<sup>2</sup> Trace metals samples collected using the clean-hands/dirty hands sample collection technique (EPA 1996)

<sup>3</sup> Hydrolab sondes were placed in moving water.

Key:

X = A sample was collected at this location or a dissolved oxygen monitoring sonde was placed at this location.

SYRCL= South Yuba River Citizens League

USACE= United States Army Corps of Engineers

-- = not applicable

**Table 7.2B-2. Water quality parameters and associated methods, reporting limits and laboratory holding times.**

Analyte		Method <sup>1</sup>	Target Reporting Limit µg/L (or other)	Hold time
<b>BASIC WATER QUALITY- FIELD<sup>2</sup></b>				
Dissolved Oxygen	DO	SM 4500-O	0.1 mg/L	Field
Flow	---	gage or visual estimate <sup>3</sup>	---	Field
pH	---	SM 4500-H	0.1 su	Field
Secchi Disc	---	---	---	Field
Specific conductance	---	SM 2510A	0.001 µSiemens/cm	Field
Turbidity	---	SM 2130 B	0.1 NTU	Field
<b>BASIC WATER QUALITY—LABORATORY<sup>4</sup></b>				
Total Organic Carbon	TOC	SM 5310	0.2 mg/L	28 d
Dissolved Organic Carbon	DOC	EPA 415.1 D	0.5/0.1	28 d
Total Dissolved Solids	TDS	EPA 2540 C/SM 2340 C	1 mg/L	7d
Total Suspended Solids	TSS	EPA 2520 D SM 2340 D	1 mg/L	7d
<b>INORGANIC IONS<sup>4</sup></b>				
Alkalinity, Total	---	SM 2340 B	2000	14 d
Calcium	Ca	EPA 6010 B	30	180 d
Chloride	Cl	EPA 300.0	20	28 d
Hardness (measured value)	---	EPA 2340 B SM 2340 C	1 mg/L as CaCO <sub>3</sub>	14 d
Magnesium	Mg	EPA 6010 B	1	180 d
Potassium	K	EPA 6010 B	500	180 d
Sodium	Na	EPA 6010 B	29	180 d
Sulfate	SO <sub>4</sub> <sup>2-</sup>	EPA 300.0	1.0 mg/L	28 d
Sulfide	S <sup>2-</sup>	SM 4500 S2 – D	0.05 mg/L	28 d
<b>NUTRIENTS<sup>4</sup></b>				
Ammonia as N, total	---	EPA 4500-NH3 SM 4500-NH3	0.02	28 d <pH 2
Kjeldahl Nitrogen as N, total	TKN	SM 4500 N	100	28 d <pH 2
Nitrate-Nitrite	---	EPA 300.0	2	28 d <pH 2
Orthophosphate, dissolved	PO <sub>4</sub>	EPA 365.1 EPA 300.0	0.01	48 h at 4 °C
Phosphorus, total	TP	SM4500 P	20	28 d <pH 2
<b>METALS (total and dissolved)<sup>5</sup></b>				
Aluminum (total and dissolved)	Al	EPA 200.8/EPA 1638	4.0/ 0.4	180 d
Arsenic (total and dissolved)	As	EPA 200.8/1638	0.15/0.04	180 d
Cadmium (total and dissolved)	Cd	EPA 200.8/1638	0.020/0.004	180 d
Chromium, Total (total and dissolved)	Cr	EPA 200.8/1638	0.010/0.03	180 d
Copper (total and dissolved)	Cu	EPA 200.8/1638	0.10/0.01	180 d
Iron (total and dissolved)	Fe	EPA 200.8/1638	10.0/3.2	180 d
Lead (total and dissolved)	Pb	EPA 200.8/EPA 1638	0.040/0.003	180 d
Mercury (total)	Hg	EPA 1631	0.0005/0.00008	28 d
Methylmercury (total and dissolved)	CH <sub>3</sub> Hg	EPA 1630	0.00005/0.000019	90 d
Nickel (total and dissolved)	Ni	EPA 200.8/1638	0.10/0.01	180 d
Selenium (total)	Se	EPA 200.8/1638	0.60/0.19	180 d
Silver (total and dissolved)	Ag	EPA 200.8/1638	0.20/0.006	180 d
Zinc (total and dissolved)	Zn	EPA 200.8/1638	0.2/0.1	180 d

**Table 7.2B-2. (continued)**

Analyte		Method <sup>1</sup>	Target Reporting Limit µg/L (or other)	Hold time
<b>BACTERIA<sup>6</sup></b>				
Total coliform	--	SM 9221	1.1 MPN	24 h
Fecal coliform	--	SM 9221	1.1 MPN	24 h
Escherichia coli	<i>E. coli</i>	SM 9221	1.1 MPN	24 h
<b>PETROLEUM HYDROCARBONS<sup>4</sup></b>				
Total Petroleum Hydrocarbons (gasoline range)	TPH-g	EPA SW8015B	50	14 d
Oil & Grease	O&G	Visual Observation	--	--

<sup>1</sup> All methods EPA methods or equivalent (APHA 2010; EPA 1996; EPA 2010).

<sup>2</sup> *In situ* measurements were collected with the Hydrolab Quanta.

<sup>3</sup> Sampling locations were co-located with temperature monitoring sites and with flow gages, as much as possible; if flow was not measured, it was visually estimated.

<sup>4</sup> Analyses were performed by CalScience Environmental Laboratories, Inc. in Garden Grove, California, a California-certified laboratory.

<sup>5</sup> Metals analyses were performed by Frontier GeoSciences, Inc. of Seattle, Washington, a California-certified laboratory. **Holding times for metals are for samples after filtration and preservation.**<sup>6</sup> Bacteria samples were sent to Cranmer Engineering and Analytical Laboratory in Grass Valley, California.

Key:

EPA = United States Environmental Protection Agency

CaCO<sub>3</sub> = Calcium carbonate

cm = centimeter

d = days

h = hours

µg/L = micrograms per liter (equals parts per billion)

mg/L = milligrams per liter (equals parts per million)

NTU = Nephelometric Turbidity Units

SM = Standard Method

su = Standard Unit

-- = not available or not applicable

**Table 7.2B-3. Standards, criteria and benchmarks used for determining consistency with Basin Plan Objectives and designated beneficial uses of water in Project reservoirs and Project-affected stream reaches.<sup>1</sup>**

Basin Plan Water Quality Objective (Potentially Affected Beneficial Uses)	Symbol or Abbreviation	Standard, Criteria or Benchmark Value <sup>2</sup>	Reference	Notes
<b>BIOSTIMULATORY SUBSTANCES (COLD, SPAWN)</b>				
Total Kjeldahl Nitrogen	TKN	None	--	--
Total Phosphorous	TP	None	--	--
<b>CHEMICAL CONSTITUENTS (AGR, MUN)</b>				
Alkalinity (as CaCO <sub>3</sub> )	--	20 mg/L (minimum)	Marshack 2008	Low alkalinity can affect water treatment
Aluminum	Al	1 mg/L	CDHS 2005 cited in CVRWQCB 1998	Title 22 Primary MCL
Arsenic	As	0.010 mg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Cadmium	Cd	5 µg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Calcium	Ca	None	--	--
Chromium (total)	Cr (total)	50 µg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Copper	Cu	1.3 mg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Lead	Pb	15 µg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL

**Table 7.2B-3. (continued)**

Basin Plan Water Quality Objective (Potentially Affected Beneficial Uses)	Symbol or Abbreviation	Standard, Criteria or Benchmark Value <sup>2</sup>	Reference	Notes
<b>CHEMICAL CONSTITUENTS (AGR, MUN) (continued)</b>				
Mercury (inorganic)	Hg	0.002 mg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Nickel	Ni	0.1 mg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Nitrate	NO <sub>3</sub>	45 mg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Nitrite	NO <sub>2</sub>	1 mg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Nitrate + Nitrite	NO <sub>3</sub> + NO <sub>2</sub>	10 mg/L (combined total)	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Potassium	K	None	--	--
Selenium	Se	0.05 mg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL
Sodium	Na	20 mg/L	Marshack 2008	Sodium Restricted Diet <sup>3</sup>
Specific conductance	--	150 µmhos	CVRWQCB 1998	Aquatic Life Protection
Zinc	Zn	5 mg/L	CDPH 2010 cited in CVRWQCB 1998	Title 22 Secondary MCL
<b>DISSOLVED OXYGEN (COLD, SPAWN)</b>				
Dissolved Oxygen	DO	7.0 mg/L (minimum)	CVRWQCB 1998	Aquatic life protection
<b>FLOATING MATERIAL (REC-1, REC-2)</b>				
Floating Material	--	Narrative Criteria	CVRWQCB 1998	Aesthetic – Absent by visual observation
<b>OIL &amp; GREASE (REC-1, REC-2)</b>				
Oil & Grease	--	Narrative Criteria	CVRWQCB 1998	Aesthetic – Absent by visual observation
Total Petroleum Hydrocarbons	TPH	None	--	--
<b>pH (COLD, SPAWN, WILD)</b>				
pH	--	6.5-8.5	CVRWQCB 1998	Aquatic life protection
<b>SEDIMENT AND SETTLEABLE SOLIDS (REC-2, SPAWN, WILD)</b>				
Sediment	--	Narrative Criteria	CVRWQCB 1998	--
<b>TASTES &amp; ODORS (MUN)</b>				
Aluminum	Al	0.2 mg/L	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
Chloride	Cl	250 mg/L	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
Copper	Cu	1 mg/L	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
Iron	Fe	0.3 mg/L	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
Silver	Ag	0.1 mg/L	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
Specific Conductance	--	900 µmhos	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
Sulfate	SO <sub>4</sub>	250 mg/L	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
Total Dissolved Solids	TDS	500 mg/L	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
Zinc	Zn	5 mg/L	CDPH 2005 cited in CVRWQCB 1998	Title 22 Secondary MCL
<b>TEMPERATURE (COLD, SPAWN)</b>				
Temperature	--	Narrative Criteria	CVRWQCB 1998	--
<b>TOXICITY (COLD, SPAWN, MUN)<sup>4</sup></b>				
Alkalinity (as CaCO <sub>3</sub> )	--	20 mg/L (minimum concentration except where natural concentrations are less.)	Marshack 2008	Low alkaline waters susceptible to acidification

**Table 7.2B-3. (continued)**

Basin Plan Water Quality Objective (Potentially Affected Beneficial Uses)	Symbol or Abbreviation	Standard, Criteria or Benchmark Value <sup>2</sup>	Reference	Notes
<b>TOXICITY (COLD, SPAWN, MUN)<sup>4</sup> (continued)</b>				
Aluminum	Al	0.087 µg/L <sup>5</sup>	Marshack 2008	EPA AWQC; aquatic life protective
Ammonia as N (pH and Temp dependent)	NH <sub>3</sub> -N	24.1 mg/L (CMC); 4.1-5.9 mg/L (CCC)	EPA 2000	CTR criteria over 0-20°C assuming pH 7.0
		5.6 mg/L (CMC); 1.7-2.4 mg/L (CCC)	EPA 2000	CTR criteria over 0-20°C assuming pH 8.0
		0.9 mg/L (CMC); 0.3-0.5 mg/L (CCC)	EPA 2000	CTR criteria over 0-20°C assuming pH 9.0
Arsenic	As	340 µg/L (CMC); 150 µg/L (CCC)	EPA 2000	CTR criteria
Cadmium (hardness dependent)	Cd	0.23 µg/L (CMC); 0.15 µg/L (CCC)	EPA 2000	CTR for unfiltered sample assuming hardness of 5 mg/L as CaCO <sub>3</sub>
		0.4 µg/L (CMC); 0.34 µg/L (CCC)	EPA 2000	CTR for unfiltered sample assuming hardness of 10 mg/L as CaCO <sub>3</sub>
		0.56 µg/L (CMC); 0.53 µg/L (CCC)	EPA 2000	CTR for unfiltered sample assuming hardness of 15 mg/L as CaCO <sub>3</sub>
		0.83 µg/L (CMC); 0.95 µg/L (CCC)	EPA 2000	CTR for unfiltered sample assuming hardness of 25 mg/L as CaCO <sub>3</sub>
Chromium (hardness dependent)	Cr	47.19 µg/L (CMC); 15.31 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 5 mg/L as CaCO <sub>3</sub>
		83.25 µg/L (CMC); 27.0 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 10 mg/L as CaCO <sub>3</sub>
		116.03 µg/L (CMC); 37.64 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 15 mg/L as CaCO <sub>3</sub>
		176.31 µg/L (CMC); 57.19 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 25 mg/L as CaCO <sub>3</sub>
Copper (hardness dependent)	Cu	0.83 µg/L (CMC); 0.72 µg/L (CCC)	EPA 2000	CTR for unfiltered sample assuming hardness of 5 mg/L as CaCO <sub>3</sub>
		1.6 µg/L (CMC); 1.3 µg/L (CCC)	EPA 2000	CTR for unfiltered sample assuming hardness of 10 mg/L as CaCO <sub>3</sub>
		2.34 µg/L (CMC); 1.84 µg/L (CCC)	EPA 2000	CTR for unfiltered sample assuming hardness of 15 mg/L as CaCO <sub>3</sub>
		3.79 µg/L (CMC); 2.85 µg/L (CCC)	EPA 2000	CTR for unfiltered sample assuming hardness of 25 mg/L as CaCO <sub>3</sub>
Lead (hardness dependent)	Pb	2 µg/L (CMC) 0.086 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 5 mg/L as CaCO <sub>3</sub>
		5 µg/L (CMC) 0.191 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 10 mg/L as CaCO <sub>3</sub>
		8 µg/L (CMC) 0.303 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 15 mg/L as CaCO <sub>3</sub>
		0.54 µg/L (CCC) 14 µg/L (CMC)	EPA 2000	CTR for dissolved sample assuming hardness of 25 mg/L as CaCO <sub>3</sub>

**Table 7.2B-3. (continued)**

Basin Plan Water Quality Objective (Potentially Affected Beneficial Uses)	Symbol or Abbreviation	Standard, Criteria or Benchmark Value <sup>2</sup>	Reference	Notes
<b>TOXICITY (COLD, SPAWN, MUN)<sup>4</sup> (continued)</b>				
Mercury	Hg	0.050 µg/L	EPA 2000 40 CFR 131.38	CTR/Federal Register. 5/18/00
Nickel (hardness dependent)	Ni	37.2 µg/L (CMC); 4.1 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 5 mg/L as CaCO <sub>3</sub>
		66.9 µg/L (CMC); 7.4 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 10 mg/L as CaCO <sub>3</sub>
		94.3 µg/L (CMC); 10.5 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 15 mg/L as CaCO <sub>3</sub>
		145.2 µg/L (CMC); 16.1 µg/L (CCC)	EPA 2000	CTR for dissolved sample assuming hardness of 25 mg/L as CaCO <sub>3</sub>
Nitrate-Nitrite	NO <sub>3</sub> -N+NO <sub>2</sub> -N	10 mg/L (combined total)	CDPH 2010 cited in CVRWQCB 1998	Title 22 Primary MCL (“Blue baby Syndrome”)
Silver (hardness dependent)	Ag	0.02 µg/L (CMC) instantaneous	EPA 2000	CTR for unfiltered sample assuming hardness of 5 mg/L as CaCO <sub>3</sub>
		0.08 µg/L (CMC) instantaneous	EPA 2000	CTR for unfiltered sample assuming hardness of 10 mg/L as CaCO <sub>3</sub>
		0.16 µg/L (CMC) instantaneous	EPA 2000	CTR for unfiltered sample assuming hardness of 15 mg/L as CaCO <sub>3</sub>
		0.37 µg/L (CMC) instantaneous	EPA 2000	CTR for unfiltered sample assuming hardness of 25 mg/L as CaCO <sub>3</sub>
Zinc (hardness dependent)	Zn	9.47 µg/L	EPA 2000	CTR for unfiltered sample assuming hardness of 5 mg/L as CaCO <sub>3</sub>
		17.03 µg/L	EPA 2000	CTR for unfiltered sample assuming hardness of 10 mg/L as CaCO <sub>3</sub>
		24.01 µg/L	EPA 2000	CTR for unfiltered sample assuming hardness of 15 mg/L as CaCO <sub>3</sub>
		37.02 µg/L	EPA 2000	CTR for unfiltered sample assuming hardness of 25 mg/L as CaCO <sub>3</sub>
<b>TURBIDITY (COLD, SPAWN, WILD, MUN)</b>				
Turbidity	NTU	increase < 1 NTU for 1-5 NTU background; increase < 20% for 5-50 NTU background	CVRWQCB 1998	Aesthetic, disinfection, egg incubation
<b>BACTERIA (MUN, REC-1)</b>				
Total coliform	--	< 10,000 MPN per 100 mL < 240 MPN per 100 mL (geometric mean);	EPA 2003	Water contact recreation, single-day sample; Water contact recreation, 30-day geometric mean
Fecal coliform	--	< 200 MPN per 100 mL (geometric mean); < 10% of samples > 400 MPN per 100 mL	CVRWQCB 1998	Water contact recreation, 30-day geometric mean; with individual samples not > 400 MPN/100 mL

**Table 7.2B-3. (continued)**

Basin Plan Water Quality Objective (Potentially Affected Beneficial Uses)	Symbol or Abbreviation	Standard, Criteria or Benchmark Value <sup>2</sup>	Reference	Notes
<b>BACTERIA (MUN, REC-1) (continued)</b>				
Escherichia coli	<i>E. coli</i>	< 126 MPN per 100 mL (geometric mean) <235 MPN per 100 mL in any single sample	EPA 2003	Water contact recreation, 30-day geometric mean

- <sup>1</sup> Beneficial uses are designated in CVRWQCB 1998; a constituent may be listed under more than one beneficial use.  
<sup>2</sup> When a standard or criterion was not available, benchmarks were excerpted from EPA (2003) and Marshack (2008).  
<sup>3</sup> Guidance level to protect those individuals restricted to a total sodium intake of 500 mg/day (Marshack 2008).  
<sup>4</sup> California Toxics Rule (CTR) values assume total recoverable concentrations of filtered samples (dissolved fraction).  
<sup>5</sup> Benchmark is likely overly protective, as EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 0.087 µg /L aluminum when either total recoverable or dissolved is measured (Marshack 2008)

Key:

- AWQC = Ambient Water Quality Criteria  
EPA = Environmental Protection Agency  
CaCO<sub>3</sub> = Calcium carbonate  
CMC = Criterion Maximum Concentration (1-hour acute exposure) for aquatic toxicity as defined by EPA (2000)  
CCC = Criterion Continuous Concentration (4-day chronic exposure) for aquatic toxicity as defined by EPA (2000)  
CTR = California Toxics Rule  
MCL = Maximum Contaminant Level  
µmhos = micro-mhos  
µg/L = micrograms per liter  
mg/L = milligrams per liter  
MPN = Most Probable Number  
NTU = Nephelometric turbidity units  
SM = Standard Method  
su = standard unit  
-- = not available or not applicable

**Table 7.2B-4. Sample-specific hardness dependent freshwater aquatic life criteria.**

Hardness (mg/L)	Hardness Dependent Aquatic Life Criteria <sup>1,2</sup>						
	Criteria Continuous Concentration (CCC) (dissolved)						
	Cadmium (µg/L)	Chromium (µg/L)	Copper (µg/L)	Lead (µg/L)	Nickel (µg/L)	Silver (µg/L)	Zinc (µg/L)
21	0.72	49.5	2.36	0.44	13.8	0.24	31.5
34	1.02	73.5	3.56	0.76	20.8	0.54	47.4
36	1.07	77.1	3.74	0.81	21.9	0.60	49.7
37	1.09	78.8	3.83	0.84	22.4	0.62	50.9
38	1.11	80.5	3.92	0.87	22.9	0.65	52.0
40	1.15	84.0	4.09	0.92	23.9	0.71	54.4
48	1.32	97.5	4.78	1.12	27.9	0.98	63.4
64	1.64	123	6.12	1.54	35.6	1.60	80.9
72	1.78	136	6.76	1.76	39.3	1.96	89.4
75	1.84	140	7.00	1.84	40.7	2.10	92.5
79	1.91	146	7.32	1.95	42.6	2.30	96.8
90	2.10	163	8.19	2.24	47.5	2.88	108

Note: All concentrations are in µg/L or parts-per-billion.

<sup>1</sup> Significant figures presented herein are an artifact of the Excel spreadsheet used for calculations

<sup>2</sup> California Toxics Rule (dissolved fraction) calculations excerpted from Marshack (2008):

Cadmium (Cd) CCC<sub>Cd</sub> =  $[e^{[0.7852[\ln(\text{Hardness})]-2.715]}][1.11672-[\ln(\text{Hardness})*0.041838]]$   
Chromium (Cr) CCC<sub>Cr</sub> =  $[e^{[0.819[\ln(\text{Hardness})]+1.561]}][0.86]$   
Copper (Cu) CCC<sub>Cu</sub> =  $[e^{[0.8545[\ln(\text{Hardness})]+1.702]}][0.96]$   
Lead (Pb) CCC<sub>Pb</sub> =  $[e^{[1.273[\ln(\text{Hardness})]-4.705]}][1.46203-[\ln(\text{Hardness})*0.145712]]$   
Nickel (Ni) CCC<sub>Ni</sub> =  $[e^{[0.846[\ln(\text{Hardness})]+0.0584]}][0.997]$   
Silver (Ag) CCC<sub>Ag</sub> =  $[e^{[1.72[\ln(\text{Hardness})]-6.52]}][0.85]$   
Zinc (Zn) CCC<sub>Zn</sub> =  $[e^{[0.8473[\ln(\text{Hardness})]+0.884]}][0.986]$

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Table 7.2B-5. Reservoir and stream reach sample results.

Analyte	Standard Criteria or Benchmark <sup>1</sup>	River Name		North Yuba River		Middle Yuba River		Oregon Creek		Oregon Creek		North Yuba River		North Yuba River		North Yuba River		Yuba River		South Yuba River		Yuba River		Yuba River		Yuba River		Yuba River		Yuba River		Yuba River			
		Sample Location	New Bullards Bar Inflow	Above Our House Dam Diversion	Below Our House Dam Diversion	Above Log Cabin Diversion Dam	Below Log Cabin Diversion Dam	New Bullards Bar Reservoir <sup>2</sup>	New Bullards Bar Reservoir <sup>2</sup>	Below New Bullards Bar Dam	Below Colgate Tunnel	Englebright Inflow	Englebright Reservoir <sup>2</sup>	Englebright Reservoir <sup>2</sup>	Below Smartville gage	Below Deer Creek	Below Daquerre Diversion Dam	At Walnut Avenue	Marysville																
		Lat./Long.	0655730, 4354999	0672624, 4364531	0672379, 4364362	0667280, 4367442	0667039, 4367286	0660148, 4362475	0660148, 4362476	--	0655730, 4354999	--	0649344, 4344972	0649344, 4344973	06449012, 4344349	0643788, 4342522	0634234, 4341040	0627459, 4337347	0621943, 4332656																
		Sample ID	103410-2-1	103410-2-2	103410-2-3	103410-2-4	103410-2-5	103410-1-1A	103410-1-1B	103410-2-6	103410-2-7	103410-2-8	103410-1-2A	103410-1-2B	103410-2-9	103410-2-10	103410-2-11	103410-2-12	103410-2-13																
		Sample Depth	Surface	Surface	Surface	Surface	Surface	Surface	Bottom	Surface	Surface	Surface	Surface	Bottom	Surface	Surface	Surface	Surface	Surface																
		Date	09/15/2009	09/15/2009	09/15/2009	09/15/2009	09/15/2009	09/17/2009	09/17/2009	09/14/2009	09/14/2009	09/14/2009	09/17/2009	09/17/2009	09/14/2009	09/16/2009	09/16/2009	09/16/2009	09/16/2009																
		Sample Type	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original																
		Units	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	
<b>IN SITU MEASUREMENTS</b>																																			
Stream Flow <sup>3</sup>	--	cfs	121		25		30		--	2		--			6		763.7		53		--		--		4.4		782		782		782		782		
Secchi	--	ft	--		--		--		--		9		--		--		--		--		12		--		--		--		--		--		--		
Temperature	--	°C	8.79		18.26		17.98		15.87		16.12		23.28		7.43		8.79		8.42		20.85		20.03		9.11		11.38		12.35		14.33		16.63		16.08
Dissolved Oxygen	--	% sat	104.8		--		--		--		--		--		104.8		102.9		--		--		--		83.1		--		86.6		--		--		--
Dissolved Oxygen	7 (minimum)	mg/L	10.22		8.17		7.65		9.67		7.92		7.71		8.02		10.22		10.13		7.25		9.2		6.13		7.49		9.5		7.26		8.72		7.67
Specific Conductance	150	µmohms	0.068		0.15		0.151		0.137		0.192		0.1		0.1		0.068		0.065		0.107		0.1		0.1		0.069		0.075		0.078		0.081		0.083
pH	6.5-8.5	stnd units	8.31		7.51		7.31		8.07		7.81		8.37		7.21		8.31		7.72		7.91		8.33		7.36		7.75		7.76		7.7		8.05		8.01
Turbidity	--	NTU	3.1		1.3		0.5		3.3		14.5		0.4		0		3.1		2.2		0		147.2		4		6.3		0.3		1.2		1.5		15.4
<b>BASIC WATER QUALITY</b>																																			
Carbon, Dissolved Organic	--	mg/L	0.61		0.67		1.2		0.98		0.69		1.1		1.1		1.1		1.3		1		1.1		1.4		1.4		1.1		1.1		1.1		1.1
Carbon, Total Organic	--	mg/L	0.73		0.82		1.4		1.2		0.76		1.1		1.2		1.1		1.2		1.1		1.3		1.4		1.4		1.2		1.2		1.1		1.2
Solids, Total Dissolved	500	mg/L	70		66		54		92		66		50		36		51		51		58		40		46		53		62		68		64		68
Solids, Total Suspended	--	mg/L	1.5		1.2		1 U		4.5		1 U		1 U		1 U		1 U		1 U		1 U		1 U		1.5		14		1 U		1 U		1 U		15
<b>INORGANIC IONS</b>																																			
Alkalinity, Total (as CaCO <sub>3</sub> )	20 (minimum)	mg/L	72		72		72		86		80		36		34		34		31		44		36		34		54		1 U		37		37		38
Calcium	--	mg/L	20.4		20.9		11.3		21		22.1		9.71		9.16		9.35		8.69		12.1		9.18		8.29		9.02		9.32		9.52		9.76		9.19
Chloride	250	mg/L	0.68 J		0.7 J		0.88 J		1.7		0.76 J		0.63 J		0.5 J		0.53 J		0.49 J		2.6		0.63 J		0.8 J		0.63 J		0.74 J		0.82 J		0.93 J		0.88 J
Hardness, Total	--	mg/L	72		75		64		90		79		38		34		36		34		48		36		21		37		36		37		38		40
Magnesium	--	mg/L	5.09		5.29		9.24		8.63		5		2.77		2.62		2.78		2.59		3.84		2.73		2.78		2.71		2.87		3.06		3.41		3.3
Potassium	--	mg/L	0.6		0.606		0.766		1.34		0.361 J		0.607		0.519		0.519		0.512		0.529		0.493 J		0.6		0.427 J		0.434 J		0.519		0.546		0.511
Sodium <sup>4</sup>	20	mg/L	3.53		3.4		3.17		5.31		3.16		2.37		2.04		1.94		1.9		4.3		2.17		2.25		2.02		2.34		2.39		2.51		2.42
Sulfate	250	mg/L	9.5		9.7		7.8		15		7.5		3.7		3.3		5.6		5.3		9.6		5.8		3.8		5.5		170		3.9		4.4		4.6
Sulfide, Total	--	mg/L	0.05 U		0.05 U		0.05 U		0.05 U		0.05 U		--		0.05 U		--		--		--		0.05 U		0.05 U		--		0.05 U		0.05 U		0.05 U		0.05 U
<b>NUTRIENTS</b>																																			
Ammonia (as N) <sup>5</sup>	temp/pH dep.	mg/L	0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U
Nitrate (as N)	45	mg/L	0.1 U		0.02 J		0.1 U		0.028 J		0.1 U		0.1 U		0.027 J		0.036 J		0.1 U		0.1 U		0.1 U		0.069 J		0.021 J		0.1 U		0.028 J		0.1 U		0.1 U
Nitrite (as N)	1	mg/L	0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U
o-Phosphate (as P)	--	mg/L	0.028 J		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.083 J		0.1 U		0.1 U		0.1 U
Phosphorus, Total	--	mg/L	0.39		0.38		0.48		0.72		0.36		0.16		0.21		0.37		0.37		0.19		0.22		0.2		0.26		0.42		0.21		0.33		0.32
Total Kjeldahl Nitrogen	--	mg/L	0.56		0.7		0.84		0.7		0.56		0.7		0.56		0.5 U		0.5 U		0.56		0.56		0.56		0.56		0.5 U		0.5 U		0.56		0.56

Analyte	Standard Criteria or Benchmark <sup>1</sup>	River Name		North Yuba River		Middle Yuba River		Middle Yuba River		Oregon Creek		Oregon Creek		North Yuba River		North Yuba River		North Yuba River		Yuba River		South Yuba River		Yuba River												
		Sample Location	New Bullards Bar Inflow	Above Our House Dam Diversion	Below Our House Dam Diversion	Above Log Cabin Diversion Dam	Below Log Cabin Diversion Dam	New Bullards Bar Reservoir <sup>2</sup>	New Bullards Bar Reservoir <sup>2</sup>	Below New Bullards Bar Dam	Below Colgate Tunnel	Englebright Inflow	Englebright Reservoir <sup>2</sup>	Englebright Reservoir <sup>2</sup>	Englebright Reservoir <sup>2</sup>	Below Smartville gage	Below Deer Creek	Below Daquerre Diversion Dam	At Walnut Avenue	Marysville																
		Lat./Long.	0655730, 4354999	0672624, 4364531	0672379, 4364362	0667280, 4367442	0667039, 4367286	0660148, 4362475	0660148, 4362476	--	0655730, 4354999	--	0649344, 4344972	0649344, 4344973	06449012, 4344349	0643788, 4342522	0634234, 4341040	0627459, 4337347	0621943, 4332656																	
		Sample ID	103410-2-1	103410-2-2	103410-2-3	103410-2-4	103410-2-5	103410-1-1A	103410-1-1B	103410-2-6	103410-2-7	103410-2-8	103410-1-2A	103410-1-2B	103410-2-9	103410-2-10	103410-2-11	103410-2-12	103410-2-13																	
		Sample Depth	Surface	Surface	Surface	Surface	Surface	Surface	Bottom	Surface	Surface	Surface	Surface	Bottom	Surface	Surface	Surface	Surface	Surface																	
		Date	09/15/2009	09/15/2009	09/15/2009	09/15/2009	09/15/2009	09/17/2009	09/17/2009	09/14/2009	09/14/2009	09/14/2009	09/17/2009	09/17/2009	09/14/2009	09/16/2009	09/16/2009	09/16/2009	09/16/2009																	
		Sample Type	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original	Original																	
		Units	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes	Result	Notes		
<b>TOTAL METALS CONCENTRATIONS</b>																																				
Aluminum <sup>6</sup>	87	µg/L	8.4		5.9		4.7		9.1		5.4		74.0		28.8		20.0		36.3		7.6		29.4		20.2		20.9		21.4		13.1		15.6		<b>180</b>	
Arsenic <sup>7</sup>	10	µg/L	4.91		5.42		1.08		4.07		1.01		0.39		0.36		0.48		0.51		0.59	Q	0.52		0.46		0.64		0.64		0.51		0.54		0.61	
Cadmium	5	µg/L	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U
Chromium	50	µg/L	0.31		0.27		0.34		0.15		0.36		0.18	Q	0.28		0.24		0.23		0.18		0.24		0.22		0.24		0.22		0.22		0.16		0.50	
Copper	1000	µg/L	0.40	Q	0.41	Q	0.41	Q	0.34	Q	0.29	Q	0.31	Q	0.41	Q	0.42	Q	0.43		0.76	Q	0.47	Q	0.59		0.49	Q	0.43	Q	0.43		0.44		0.96	
Iron	300	µg/L	60.2		130		37.6		<b>1770</b>		56.4		15.5		14.5		43.9		43.0		44.5		21.3		19.6		64.0		43.9		14.0		33.2		243	
Lead	15	µg/L	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.141	
Mercury	50	ng/L	0.61		0.59		0.71		0.58		0.56		0.50	U	0.82		0.50	U	0.60		0.82		0.89		0.50	U	0.72		1.08		1.04		1.00		3.10	
Methyl Mercury	--	ng/L	0.092		0.096	Q	0.073		0.277		0.077	Q	0.050	U	0.050	Q, U	0.067	Q	0.050	U	0.069		0.050	Q, U	0.050	Q, U	0.062		0.050	Q, U	0.052		0.052		0.109	
Nickel	100	µg/L	0.95		1.06	Q	3.08		2.33		0.64	Q	0.10	Q, U	0.84		0.50		0.97		0.51	Q	0.55		0.84	Q	0.93	Q	0.64	Q	0.48	Q	0.44	Q	1.05	
Selenium	50	µg/L	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U
Silver	100	µg/L	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U
Zinc	5000	µg/L	0.30		0.49		0.34		0.35	Q	0.26	Q	0.20	U	0.25	Q	0.32	Q	0.23	Q	0.20	Q, U	0.72		0.45		0.24	Q	0.25	Q	0.48	Q	0.25		0.84	
<b>DISSOLVED METALS CONCENTRATIONS</b>																																				
Aluminum	--	µg/L	4.4		4.0	U	4.0	U	4.0	U	4.0	U	12.2		9.9		4.0	U	4.7		4.0	U	4.7		4.7		4.0	U	4.0	U	4.0	U	4.0	U	4.0	U
Arsenic	150	µg/L	4.91		5.12		1.08		2.05		1.00		0.37		0.36		0.43		0.50		0.64	Q	0.52		0.39		0.58		0.58		0.50		0.50		0.52	
Cadmium <sup>8</sup>	Table 7.2B-4	µg/L	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U
Chromium <sup>8</sup>	Table 7.2B-4	µg/L	0.24		0.21		0.32		0.10	U	0.33		0.17	Q	0.24		0.23		0.19		0.15		0.21		0.22		0.23		0.20		0.20		0.16		0.14	
Copper <sup>8</sup>	Table 7.2B-4	µg/L	0.51	Q	0.49	Q	0.43	Q	0.37	Q	0.40	Q	0.40	Q	0.42	Q	0.43	Q	0.39		0.85	Q	0.48	Q	0.82		0.60	Q	0.46	Q	0.68		0.43		0.41	
Iron	--	µg/L	49.9		83.0		31.8		143		53.6		10.0	U	10.0	U	26.6		25.3		35.5		10.0	U	10.0	U	37.1		10.0	U	10.0	U	10.0	U	12.8	
Lead <sup>8</sup>	Table 7.2B-4	µg/L	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040	U
Methyl Mercury	--	ng/L	0.54	U	0.100	Q	0.050	U	0.211		0.077	Q	0.050	U	0.050	Q, U	0.077	Q	0.050	U	0.050	U	0.050	Q, U	0.050	Q, U	0.050	U	0.050	Q, U	0.053		0.050	U	0.067	
Nickel <sup>8</sup>	Table 7.2B-4	µg/L	0.88		1.14	Q	2.91		2.12		0.74	Q	0.17	Q	0.78		0.43		0.93		0.60	Q	0.52		0.90	Q	0.99	Q	0.68	Q	0.67	Q	0.47	Q	0.46	
Silver <sup>8</sup>	Table 7.2B-4	µg/L	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020	U
Zinc <sup>8</sup>	Table 7.2B-4	µg/L	0.20	U	0.39		0.20		0.61	Q	0.34	Q	0.20	U	0.48	Q	0.53	Q	0.40	Q	0.31	Q	0.20	U	1.36		0.45	Q	0.32	Q	0.52	Q	2.19		0.20	U

**Table 7.2B-6. Bacteria and Total Petroleum Hydrocarbon (TPH) sample results.**

Sample Date <sup>1</sup>	Sample Location and Number					
	Emerald Cove Marina		Dark Day Boat Ramp		Reference Site <sup>2</sup>	
	103410-3-1	Duplicate	103410-3-2	Duplicate	103410-3-3	
<b>FECAL COLIFORM RESULTS (MPN PER 100 ML)</b>						
< 10% of samples > 400 MPN per 100 mL; < 200 MPN per 100 mL (geometric mean) (CVRWQCB 1998)						
Round 1	9/6/09	<2	--	2	2	--
Round 2	9/17/09	<2	<2	<2	--	<2
Round 3	9/23/09	<2	--	<2	<2	--
Round 4	9/28/09	4	7	<2	--	--
Round 5	10/2/09	<2	--	<2	<2	--
Geometric Mean		<2	--	<2	--	--
<b>TOTAL COLIFORM RESULTS (MPN PER 100 ML)</b>						
< 10,000 MPN per 100 mL; < 240 MPN per 100 mL (geometric mean) (EPA 2003)						
Round 1	9/6/09	816	--	1733	517	--
Round 2	9/17/09	136	136	78	--	46
Round 3	9/23/09	2419	--	491	457	--
Round 4	9/28/09	1733	1300	866	--	--
Round 5	10/2/09	1553	--	<2419	690	--
Geometric Mean		<b>937</b>	--	<b>674</b>	--	--
<b>E. COLI RESULTS (MPN PER 100 ML)</b>						
<235 MPN per 100 mL in any single sample; < 126 MPN per 100 mL (geometric mean) (EPA 2003)						
Round 1	9/6/09	1	--	absent	--	--
Round 2	9/17/09	absent	absent	absent	--	absent
Round 3	9/23/09	absent	--	absent	absent	--
Round 4	9/28/09	1	absent	absent	--	--
Round 5	10/2/09	absent	--	absent	absent	--
Geometric Mean		absent	--	absent	--	--
<b>TOTAL PETROLEUM HYDROCARBONS (MG/L)</b>						
“...waters shall not contain oils, greases, waxes or other materials in concentrations that cause nuisance, result in visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.” (CVRWQCB 1998)						
Labor Day Weekend	9/6/09	<50		48 J		--
		Sheen observed on September 17.		No sheen observed during field visits.		--

<sup>1</sup> Round 1 samples were collected during the holiday weekend, Labor Day 2009.

<sup>2</sup> During Round 2, a reference sample was also collected from upstream of the recreation sites and in the center of New Bullards Bar Reservoir.

Notes:

Calculated geometric means provided in **bold** are greater than the Basin Plan Water Quality Objective (CVRWQCB 1998) or benchmark (EPA 2003).

J Results were evaluated to the method detection limit (MDL); detected concentrations > or = to the MDL but < the reporting limit (RL) were qualified with a “J” flag.

< Not detected

-- Not measured at this location and time.

**Table 7.2B-7 2009 Average daily dissolved oxygen downstream of Project facilities, USACE facilities, and non-Project diversions for 18 days.**

Sonde Location	New Bullards Bar Dam Reach		Colgate Powerhouse Reach		Narrows 2 Powerhouse Reach		Daguerre Point Dam Reach	
Start Date	9/5/2009		9/24/2009		9/5/2009		9/10/2009	
End Date	9/22/2009		10/7/2009		9/22/2009		9/29/2009	
Day	DO (mg/L)	Saturation (%)	DO (mg/L)	Saturation (%)	DO (mg/L)	Saturation (%)	DO (mg/L)	Saturation (%)
<b>DISSOLVED OXYGEN (mg/L, % saturation)</b>								
“...the monthly median of the mean daily DO concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. DO concentrations shall not be reduced below the following minimum levels at any time: waters designated WARM 5.0 mg/l; waters designated COLD 7.0 mg/l; waters designated SPWN 7.0 mg/l.” (CVRWQCB 1998)								
1	10.0	91.4	11.3	98.9	10.5	97.3	8.7	86.2
2	10.1	91.4	11.4	98.8	10.5	97.5	8.6	85.1

**Table 7.2B-7 (continued)**

Sonde Location	New Bullards Bar Dam Reach		Colgate Powerhouse Reach		Narrows 2 Powerhouse Reach		Daguerre Point Dam Reach	
Start Date	9/5/2009		9/24/2009		9/5/2009		9/10/2009	
End Date	9/22/2009		10/7/2009		9/22/2009		9/29/2009	
Day	DO (mg/L)	Saturation (%)	DO (mg/L)	Saturation (%)	DO (mg/L)	Saturation (%)	DO (mg/L)	Saturation (%)
3	10.0	91.5	11.4	99.1	10.6	97.8	7.9	78.2
4	10.1	91.0	11.3	98.5	10.5	97.3	9.2	89.1
5	10.1	91.8	11.3	98.2	10.5	97.2	9.2	90.3
6	10.1	91.9	11.6	99.8	10.5	96.9	9.2	89.0
7	10.0	91.8	11.8	101.4	10.5	96.9	9.2	91.9
8	10.0	91.3	10.8	94.2	10.4	96.6	9.1	90.3
9	10.1	91.2	10.8	94.2	10.4	96.6	9.0	89.8
10	10.1	92.0	10.8	93.4	10.4	96.6	9.0	90.1
11	10.1	91.6	10.8	94.5	10.4	96.5	9.1	90.8
12	10.1	91.9	10.9	94.7	10.4	96.4	8.8	87.0
13	10.1	91.8	10.9	95.4	10.4	96.2	8.8	87.3
14	10.1	91.5	11.0	95.1	10.4	96.8	9.1	89.3
15	10.1	91.9	11.3	98.9	10.3	95.9	9.0	89.4
16	10.1	91.6	11.4	98.8	10.3	96.1	8.9	87.0
17	10.1	91.8	11.4	99.1	10.3	96.6	8.7	86.2
18	10.2	91.8	11.3	98.5	10.3	96.4	8.8	86.7
minimum	10.0	91.0	10.8	93.4	10.3	95.9	7.9	78.2
maximum	10.2	92.0	11.8	101.4	10.6	97.8	9.2	91.9