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Subject: Comments on Sites Reservoir Project Revised Draft EIR/Supplemental Draft EIS
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Attachments: Sites DEIR 2.docx

Attached are my comments on the Sites Reservoir Project Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement.

Jerry Boles

The Draft EIR is an improvement from the 2017 version in that it at least acknowledges some water quality issues, but continues to ignore other water quality issues, makes inaccurate and misleading statements, and offers conflicting and contradicting strategies to attempt to lessen significant and substantial adverse impacts.

The data in the WDL for the Sacramento River and Cottonwood Creek demonstrate that high concentrations of metals can be expected during the high flow months of winter (December through March) when diversions would be occurring to the proposed Sites Reservoir. Higher concentrations of metals are likely during the higher flows that can occur during these months. Such higher flows were not targeted by the limited sampling effort presented in the WDL. The high concentrations of metals in the source water will adversely impact water quality in the proposed reservoir for most, if not all, the proposed beneficial uses of the stored water.

Some metals from both the Sacramento River and Cottonwood Creek, whose concentrations did not exceed criteria in the limited sampling effort, had concentrations that nearly exceed the criteria and standards. These and other metals whose concentrations did not exceed the criteria may have higher concentrations during the higher flow periods that the proposed project would be diverting. Again, these higher flow periods were not targeted during the limited sampling effort.

Even some of the minimum concentrations of metals found in the source waters exceed criteria and standards, which means that the source waters never meet these goals and standards – the criteria are always exceeded and the water is never suitable for the beneficial use or uses the criteria or standards were designed to protect. Water quality in the proposed reservoir for these parameters will exceed the criteria and standards all the time.

Since water quality in the proposed reservoir will reflect that of the source waters, the reservoir will have concentrations of numerous metals, including aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc, that exceed a number of criteria and standards developed to protect beneficial uses. In addition, other metals that may not exceed criteria and standards in the source waters may adversely affect reservoir water quality due to synergistic effects. The State Water Resources Control Board (SWRCB 2011) states that "when multiple constituents have been found together in groundwater or surface waters, their combined toxicity should be evaluated" and that "theoretical risks from chemicals found together in a water body shall be considered additive for all chemicals having similar toxicologic effects or having carcinogenic effects." Thus, the adverse effects from the metals delivered to the proposed reservoir from the source waters may have an even greater adverse impact and pose an unacceptable level of risk. Beneficial uses potentially impacted by metals in the proposed reservoir include agricultural water supply (direct toxicity or uptake by crops making the crops unsuitable for use), wildlife (such as fish-eating birds), fisheries, recreation (including sport fishing and water contact activities such as swimming), and drinking water supplies for communities that divert water from the Sacramento River.

Releases from the proposed reservoir would occur during the summer when metals concentrations in the Sacramento River are much lower due to the majority of flow being from Shasta Reservoir, with much better water quality, though still carrying a metals load. High metals concentrations in the proposed reservoir releases could adversely affect water quality in the Sacramento River during the summer months by increasing metals loads beyond acceptable limits and adversely impact beneficial uses.

Though high concentrations of metals that exceed water quality criteria exist in source waters to the proposed project, they cannot be regulated by governmental entities since they are natural occurrences. However, once contained artificially in a reservoir, they are subject to jurisdictional control by regulatory agencies. Any releases of water from the proposed reservoir will likely be subject to review by water quality regulatory agencies to ensure that such releases do not adversely affect downstream resources due to the heavy metals loads in the releases. The SWRCB has an antidegradation policy that prohibits discharges that would degrade water quality to a level below water quality objectives because no capacity would exist for degradation that will be caused by the next downstream or downgradient uses – the ability to beneficially use the water would have been impaired, even though water quality objectives would not yet have been exceeded (SWRCB 2011). The contribution of additional metal loads from releases from the proposed Sites Reservoir during the summer could cause concentrations of metals in the Sacramento River to exceed criteria and standards or at least be subject to the antidegradation policy due to an incremental increase in metals in the Sacramento River from the proposed project. Thus, the proposed project may face prohibition of releases if stored water does not meet water quality criteria or standards or if releases can cause criteria or standards to be exceeded by downstream inputs (i.e., antidegradation poicy).

During dry years, the adverse impacts associated with the project can be expected to be even greater. Flows in the Sacramento River from upstream reservoirs on the Sacramento River (i.e., Shasta Reservoir, Whiskeytown Reservoir) will be minimized during the winter months in an effort to restore water storage levels in those reservoirs. Likewise, during wet or even normal runoff years, releases from the upstream reservoirs during the winter will be curtailed during high runoff periods to prevent downstream flooding. In any of these scenarios, tributary influences, such as Cottonwood Creek, on water quality in the Sacramento River will be much greater. The proposed project would still attempt to capture as much runoff from the Sacramento River as possible, but the water diverted to the proposed project will have even greater concentrations of metals due to the majority of flow being from tributary streams (e.g., Cottonwood Creek) during dry and possibly even wet or normal runoff years.

Similarly, during the summer in dry years, releases from upstream reservoirs (i.e., Shasta Reservoir, Whiskeytown Reservoir) will be minimized. Releases to the Sacramento River from the proposed project (whether directly to the Sacramento River or indirectly through the CBD or GCID) will have a greater impact on water quality in the Sacramento River due to less dilution being available due to curtailed flows in the river from upstream reservoirs (i.e., Shasta and Whiskeytown reservoirs).

The limited data that are available are sufficient to show that water quality in the proposed reservoir will have concentrations of a large number of metals that exceed many water quality criteria and standards, including those established for the protection of agricultural water supply, wildlife and fisheries, and drinking water. Metals bioaccumulation in the reservoir food web could produce adverse impacts to fish-eating birds and other animals, as well as humans, and adversely affect any potential recreational benefit from the project. Releases from the proposed reservoir could adversely affect downstream resources, including agricultural water supply, wildlife and fisheries, and drinking water supplies for communities that divert water from the Sacramento River.

The Basin Plan lists other chemicals that adversely affect water quality in the Sacramento River, including chlorpyrifos and diazinon. The California State Water Resources Control Board lists a number of other "constituents of concern" in the study area, including chlordane, DDT, mercury, PCBs, and dieldrin. In addition, sewer outfalls from the cities of Redding and Red Bluff contribute other contaminants, such as pharmaceuticals, to the Sacramento River. Other than diazinon and a brief discussion of chlorpyrifos, DDT, and dieldrin, no information is provided in the EIR about effects to the proposed project from these chemical contaminants.

Chapter 6. Surface Water Quality

p. 6-2 and 6-3: Table 6-1b summarizes operation impacts for surface water quality resources. Impact WQ-2 (Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality during operation) is identified as CEQA significant and unavoidable (SU) and NEPA substantial adverse effect (SA) for all alternatives. Yet, somehow this is deemed as not conflicting with or obstructing implementation of a water quality control plan (Impact WQ-5). Since, as identified as Impact WQ-2, the project will violate water quality standards of the Central Valley Water Quality Control Plan (Basin Plan), this is obviously a significant impact and substantial adverse effect which conflicts with the Basin Plan.

p. 6-19: "Mean mercury concentrations in Shasta Lake and in the Sacramento River at Red Bluff and Hamilton City are substantially lower than the CTR criterion for mercury in freshwater (50 nanograms per liter [ng/L])." The Sites Reservoir project will not be diverting "mean" concentrations of mercury (or any other constituent), but rather the higher concentrations of constituents generally associated with the higher flows from which the project will be diverting. In the Sacramento River at Hamilton City, Table 6-5 shows that total mercury concentrations have been measured as high as 54 ng/L, which are higher than the CTR criterion of 50 ng/L, and raise concern for significant and substantial adverse effects when waters with these types of concentrations are diverted into the reservoir.

Table 6-5 also shows that total mercury concentrations have been measured as high as 14.4 ng/L in the Sacramento River at Red Bluff but only 0.52 ng/L in Lake Oroville. Yet these relatively low concentrations of total mercury from the water in Lake Oroville have been sufficient to cause fish from this reservoir to exceed the numeric criterion and objectives for all trophic levels of fish, including both sport and prey fish, for the protection of human health and wildlife as contained in the Sacramento–San Joaquin River Delta Estuary TMDL for Methylmercury and Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions. Fish tissue concentrations as high as 0.7 mg/kg have been found in fish from Lake Oroville (DWR 2007). Since mercury concentrations of up to only 0.52 ng/L in Lake Oroville have been sufficient to cause numeric criterion and objectives to be exceeded in this reservoir, concentrations of mercury as high as 14.4 ng/L in water diverted to the proposed reservoir from the Sacramento River at Red Bluff will undoubtedly cause highly significant impacts and substantial adverse effects in the proposed reservoir and in downstream releases.

The DEIR on page 6-17 states that "in newly constructed reservoirs, the initial inundation of soils and vegetation can cause higher net methylmercury production in early years after filling, when organic carbon is relatively abundant, relative to long-term average production. This initial spike in mercury methylation can increase the concentrations of water column methylmercury to double or triple the long-term average concentrations for up to 10 years." It also states that "the literature suggests that fish tissue concentrations of methylmercury may peak 3–8 years after filling, with concentrations slowly declining to a lower steady-state after 10–35 years." The data from Lake Oroville (which is over 50 years old) shows that even if the expected initially high mercury concentrations in the reservoir decline over time, the concentrations of mercury present in water that would be diverted to the reservoir from the Sacramento River at Red Bluff and especially at Hamilton City are sufficiently high to cause fish tissue methylmercury concentrations to exceed criterion for the protection of human health and wildlife, not just for 10 to 35 years, but for the life of the reservoir project.

The DEIR states on page 6-22 states that "the effects of mixtures of metals on organisms in the Sacramento River are poorly understood." Nonetheless, the SWRCB states that when multiple constituents are found together, the combined toxicity of the multiple constituents should be evaluated. "In the absence of scientifically valid data to the contrary, Section 2550.4(g) of Chapter 15. Article 5 regulations referenced in the SWRCB's Site Investigation and Cleanup Policy requires that theoretical risks from chemicals found together in a water body shall be considered additive for all chemicals having similar toxicological effects or having carcinogenic effects. This requirement is also found in the California hazardous waste management regulations (Title 22 of CCR, Secion 66264.94(f) and in the USEPA Risk Assessment Guidance for Superfund (RAGS)." This DEIR did not consider the combined effects of metals and is therefore deficient.

The DEIR states on page 6-22 that metal concentration measurements are shown in Appendix 6E but that "this is not an exhaustive presentation of all measurements, but instead is provided to show patterns of metal concentrations at the Sites Reservoir intake locations (near Red Bluff and Hamilton City), in the CBD, and upstream of one of the potential release locations (upstream of the CBD)." The DEIR should not selectively filter the available data in order to support its contentions, but should show all data even though the data may prove contentions incorrect.

The DEIR states on page 6-23 that "for most metals there is little difference in concentration between upstream and downstream locations on the Sacramento River." This is not true at all. Data in WDL show substantial differences between upstream and downstream locations. For example, comparing the data for the Sacramento River at Keswick to that at Red Bluff show total aluminum as 492 ug/L vs. 3,630 ug/L, total copper as 4 ug/L vs. 14.7 ug/L, total iron as 294 ug/L vs. 4,160 ug/L, and total lead as 1.56 ug/L vs. 3.14 ug/L, all substantial differences. The differences in concentrations for these and other constituents is attributed to tributary stream inflows, with the most significant in terms of both flow and contribution of these constituents being Cottonwood Creek.

The DEIR states on page 6-31 that “contaminated sediments could move into Sites Reservoir as suspended sediments during high flows, but the main supplies of contaminated sediments and their potential effects would remain in the Sacramento River channel because the amount of sediment contained in the diversions to Sites Reservoir would be small compared to what is contained in the Sacramento River channel.” The concentration of contaminated or suspended sediments would be exactly the same in the water diverted to Sites Reservoir and that in the Sacramento River at the point and time of diversion – there is no difference in sediment load. The only difference is that the Sacramento River will carry a substantially greater load of sediment due to the substantially greater flow in the Sacramento River than the amount of water diverted to the proposed reservoir.

The DEIR states on page 6-31 that “wind, rain, and wave action commonly erode bare soil adjacent to reservoirs and could cause erosion along the edge of Sites Reservoir when it is not full. These phenomena may temporarily increase turbidity along the reservoir’s edge prior to settling of the sediment, but this increase would not markedly affect beneficial uses of the reservoir (i.e., recreation, water supply, fisheries and wildlife).” Erosion of soils in the exposed inundation zone will re-suspend soils laden with metals and other contaminants, which may then contribute to impacts in the reservoir or downstream releases.

Page 6-33 states that “when Sites Reservoir would release water to the Sacramento River, it would constitute 6%–7% of the Sacramento River flow on average and 12%–13% when discharges are relatively high compared to river flow,” and therefore “water quality in Sites Reservoir would have limited effect on the water quality in the Sacramento River.” However, page 6-32 states that evapoconcentration could increase constituent concentrations in Sites Reservoir by up to 48%. Therefore, water released from Sites Reservoir to the Sacramento River could contribute higher concentrations of constituents such as metals. The DEIR does not evaluate the effects from these higher concentrations on water quality and beneficial uses of the Sacramento River. Also, during “operational exchanges” when additional water is released from Sites Reservoir and water is held back in Shasta or Oroville reservoirs, the percent of water from Sites Reservoir constituting the total flow in the Sacramento River will be increased, potentially adversely affecting water quality in the river and impacting downstream water users.

Page 6-37 discusses Harmful Algal Blooms in relation to “whether cyanobacteria and cyanotoxins may be released from the reservoir with dead pool withdrawals” and “the elevation of the low-level intake from which dead pool withdrawals would be released.” “Dead pool” usually refers to water in a reservoir that cannot be drained by gravity through a dam's outlet works. How is the project planning on withdrawing water from the dead pool?

Page 6-42 states that the “metals analysis relies on best available data provided by DWR’s WDL” and that “these data were collected intermittently over multiple years, with measurements representing a wide range of flow conditions.” This is not true. The statement of “best available data” is an attempt to portray the WDL data as robust, which it is not. While the data were collected “intermittently over multiple years,” the data are better described as “spotty.” Sample collection for this sparse data did not target a “wide range of flow conditions,” but rather were based on a fixed schedule regardless of flow conditions. The metals data from DWR’s Water Data Library (WDL) “provide a general understanding of how metal and pesticide concentrations may vary with flow and location, allow the identification of trends, and support the impact analysis and conclusion." Water quality data in the WDL for diversion locations of the project are extremely limited. From the Sacramento River below the Red Bluff Diversion Dam, only 26 samples were collected by DWR between the years of 2000 and 2020 (Table 1) during the project's primary months of diversion to storage (January through March, p. 6-32). In eight of the 20 years of data collection from this monitoring station, only one sample was collected during the primary months of diversion to storage; only two years saw four samples collected (both were drought years); in the remaining years only two to three samples were collected during the months of January through March. This pattern of data collection is even more sparse for the Sacramento River at Hamilton City (Table 2). Only 20 samples were collected from the Hamilton City monitoring site during the project's primary months of diversion to storage. Only one sample was collected from this site in 10 of the 20 years of data collection; three samples were collected in two of the monitoring years, and four samples were collected in one year (which was a drought year). This scant yearly data collection does not "provide a general understanding of how metal and pesticide concentrations may vary with flow and location, allow the identification of trends, and support the impact analysis and conclusion." Collection of these 26 samples was not timed to address variations in concentrations due to variations of flow, but were grab samples collected on a more or less set schedule without the intent to provide sufficient data for impact analysis for any type of storage project. Concentrations of many of the metals analyzed from these samples were found to be higher when flows were higher during sample collection. However, variation in concentrations due to flow was not considered during sample collection, and even higher concentrations of metals may be found with flows higher than those during the limited sample collection.

The project proposes to collect additional samples for metals at a frequency sufficient to better understand the relationship with variations in flow, but this is only after the project has been constructed. These post-project data would "refine the understanding of metals as more data would likely improve the accuracy of equations used in this analysis for estimating metal concentrations," which is commendable but too late to better understand the adverse effects prior to construction of the project. The project proponents have been pursuing this project for over 20 years. They were also made aware of water quality issues related to this project from comments on the 2017 DEIR, providing ample time for additional data collection to further elucidate the issues prior to preparation of the current DEIR, but no data were collected by the project proponents. Failing this, now they propose to collect this needed data but only after the project is completed to determine the severity of the problems. This is backwards. CEQA requires impact analysis prior to approval and construction of a project, not afterwards. This project should not be constructed and then data collected to see if it will work or to determine the adverse impacts, but rather data should be collected and evaluated prior to approval of this project to determine adverse impacts and potential mitigation.

Based on the limited available data, the project focuses on only four metals (aluminum, copper, iron, and lead) considered to be of greatest concern due to seasonal changes in concentration and concentrations above standards (p. 6-42). The only "standards" considered are a "California MCL," "California Secondary MCL," and Freshwater Chronic Standard for Aquatic Life Protection. There are a large number of other numeric water quality thresholds applicable to this project, including California and Federal Drinking Water Standards (MCLs), California Public

Health Goals (PHGs), California State Notification and Response Levels for Drinking Water, Suggested No-Adverse-Response Levels (SNARLs), Cancer Risk Estimates, Health-based criteria from USEPA Integrated Risk Information System (IRIS), Proposition 65 Safe Harbor Levels, California Toxics Rule Criteria to Protect Human Health and Aquatic Life, USEPA Recommended Criteria to Protect Human Health and Aquatic Life, Agricultural Use Protective Limits, and Taste and Odor Based Criteria. These assessment thresholds have been summarized by the SWRCB and are presented below in Tables 3 and 4. These are the thresholds to which the proposed project should be compared, but apparently not utilized in the DEIR analyses.

In addition to the four metals considered in the DEIR, arsenic, cadmium, manganese, nickel, and zinc concentrations in water from the Sacramento River below the Red Bluff Diversion Dam as well as at Hamilton City exceed various criteria (Tables 3 and 4). The tables also show potential metal concentrations in Sites Reservoir due to evapoconcentration, as discussed on page 6-32 of the DEIR.

Cottonwood Creek is the main tributary contributor to winter flows in the Sacramento River at Red Bluff and is primarily responsible for elevated metals concentrations in the river. As an example of the influence of Cottonwood Creek on metals concentrations in the Sacramento River at Red Bluff, on March 1, 2006 when the total aluminum concentration in Cottonwood Creek was measured as 3,739 ug/L, the concentration in the Sacramento River was 2,240 ug/L (Table 5). But, similar to previous monitoring in the Sacramento River, monitoring of Cottonwood creek did not target higher flows and even higher concentrations of metals are likely to be found with the higher flows. Nor did monitoring in Cottonwood Creek always coincide with sample collection in the Sacramento River. For example, on May 5, 2005, a total aluminum concentration of 14,345 ug/L was analyzed from Cottonwood Creek, but no corresponding sample was collected from the Sacramento River. Estimating the total aluminum concentration using the concentration reported from Cottonwood Creek multiplied by the ratio of concentrations in the Sacramento River and Cottonwood Creek ((Cottonwood Cr) x (Sacramento River/Cottonwood Creek)) from March 1, 2006 yields an estimated concentration in the Sacramento River of 8,594 ug/L for May 5, 2005. This total aluminum concentration is much higher than the few measured analyses from the Sacramento River, and serves to reiterate the likelihood that even higher concentrations of metals would undoubtedly be found with more frequent monitoring and targeting of higher flows, which are the flows that would be diverted to the proposed reservoir. This same relationship applies to other metals and demonstrates that the analysis in the DEIR was not "conservative" but used the little available data to underestimate metal concentrations likely to occur. Since the project proponents have failed to collect any water quality data in the 20 years they have been promoting this project, using data projections such as that discussed above is the most appropriate measure to arrive at a reasonable evaluation.

The concentration of metals in Sites Reservoir was then calculated using the projected maximum Sacramento River concentration and applying the 48 percent evapoconcentration factor described in the DEIR. Using the "conservative" approach of the DEIR, the projected metals concentrations in the Sacramento River at Hamilton City during the May through September release period was next calculated using the maximum metal concentrations in the Sacramento River at Hamilton City (from WDL). The projected metals concentrations in the river at Hamilton City were calculated using 13 percent of the Sites Reservoir concentration after evapoconentration (Table 5) and 87 percent of the Sacramento River at Hamilton City concentration (WDL). The Sacramento River at Hamilton City site was used with the assumption that water quality in the river at Hamilton City would be similar to downstream water quality near Dunnigan, the river release site for Alternative 2. The projected metals concentrations in the Sacramento River at Hamilton City, even with dilution of Sites Reservoir releases with Sacramento River water, exceed various water quality objectives or promulgated criteria (Table 6).

Similar results can be expected for discharges from Sites Reservoir to the Colusa Basin Drain. Table 6 shows that concentrations of metals in the CBD, when mixed with 13 percent of water from Sites Reservoir and assuming average metal concentrations in the CBD (p. 6E-10), exceed water quality objectives or promulgated criteria for aluminum, arsenic, copper, iron, lead, manganese, and nickel. Introduction of water from Sites Reservoir to the CBD results in even higher concentrations in the CBD of most metals, including aluminum, cadmium, chromium, copper, iron, lead, manganese, nickel, selenium, and zinc.

The "evaluation of concentration assuming no settling of suspended sediment" starting on page 6-44 used data from the "November–May period of higher flows and concentrations to better focus on the range of flows that may occur when Sacramento River water would be diverted to Sites Reservoir." This is inconsistent with other statements in the DEIR that state that the project's primary months of diversion to storage would be January through March (page 6-32).

The DEIR states the settling of sediment entering the reservoir would substantially reduce the concentration of metals (page 6-45). Though settling of sediment (and organic matter) entering the reservoir would reduce total metal concentrations, the DEIR does not take into account resuspension of settled sediments by winds or inundation zone erosion when the reservoir level is reduced. In addition, dissolution of metals from the bottom sediments under the anoxic conditions expected to occur in the reservoir can substantially increase metals concentrations in the hypolimnion, which will become distributed throughout the water column following fall turnover. "Settling in the reservoir of 95% or more of the sediment that enters the reservoir" would create a significant source for metals in the reservoir from resuspension or dissolution during certain times of the year.

Table 1. Water Quality Data from the Sacramento River below Red Bluff during the Primary Diversion Period of January through March (D=dissolved, T=total)

Sample Date	D-Aluminum ug/L	T-Aluminum ug/L	D-Arsenic ug/L	T-Arsenic ug/L	D-Cadmium ug/L	T-Cadmium ug/L	D-Chromium ug/L	T-Chromium ug/L	D-Copper ug/L	T-Copper ug/L	D-Iron ug/L	T-Iron ug/L
1/10/05	212	322	1.11	1.18	<0.011	<0.007	1.1	1.14	1.93	2.5	143	358
2/2/05	50.1	134	0.893	0.976	<0.011	<0.066	1.35	2.42	1.67	2.04	39.8	185
3/9/05	11	97.3	1.29	1.33	<0.033	<0.011	1.21	1.23	1.39	1.84	8.1	150
1/4/06	1081	2851	1.3	1.65	0.018	0.081	2.48	7.68	6.99	9.42	811	3925
1/24/06	273	347	0.94	1.05	0.018	0.036	1.26	1.32	1.74	2.23	166	394
2/21/06	131	154	0.702	0.789	0.013	0.016	0.97	0.98	1.08	1.21	76	162
3/1/06	1459	2240	0.857	1.06	0.017	0.055	2.75	6.1	2.59	6.09	878	2854
1/10/07	41.7	91.4	1.42	1.5	<0.1	<0.1	0.55	0.59	0.92	1.01	34.9	54.3
2/26/07	212	322	0.929	0.987	<0.1	<0.1	1.2	1.61	2.55	2.8	293	376
3/21/07	9.58	51	1.41	1.46	<0.1	<0.1	0.44	0.59	1.47	1.74	21.5	85.5
1/22/08	6.82	284	1.5	1.71	<0.1	<0.1	0.53	1.15	1.45	2.04	9.5	259
2/26/08	14.2	846	0.799	0.932	<0.1	<0.1	0.33	2.49	1.97	3.88	24.6	790
3/25/08	2.25	35	1.31	1.37	<0.1	<0.1	0.42	0.55	1.7	2.09	7.8	62
2/23/09	55.6	3630	0.519	1.33	<0.1	<0.1	0.4	6.67	2.54	9.81	88.5	3740
1/25/10	127	3375	0.567	1.51	<0.1	<0.1	0.51	10.3	3.55	14.7	132	4160
2/1/10	25.5	426	0.635	0.727	<0.1	<0.1	0.3	1.07	2.14	3.34	24.1	442
3/1/10	14.0	485	0.596	0.768	<0.1	<0.1	0.33	1.6	1.55	3.03	27	574
3/23/10	1.86	13.2	1	1.06	<0.1	<0.1	0.41	0.45	1.48	2.01	8.8	33.4
1/19/11	6.75	175	0.913	1.03	<0.1	<0.1	0.57	1.22	1.54	2.42	18.6	214
1/31/11	6.26	61.4	1.17	1.18	<0.1	<0.1	0.44	0.61	1.57	1.75	9.8	69.2
2/5/13	6.69	152	1.07	1.31	<0.1	<0.1	0.33	0.56	1.23	1.66	11.4	157
2/3/14	8.61	19.3	1.92	1.93	<0.1	<0.1	0.44	0.49	0.79	0.93	31.3	46
2/3/15	4.64	169	1.29	1.62	<0.1	<0.1	0.3	0.72	1.55	3.26	10	207
2/8/16	18.7	78.8	1.23	1.33	<0.1	<0.1	0.51	0.62	1.33	1.81	23.6	104
2/6/17	130	761	0.857	1.11	<0.1	<0.1	0.46	2.11	1.64	4.67	126	729
2/13/18	4.59	23.2	1.55	1.61	<0.1	<0.1	0.58	0.71	0.96	1.22	13.2	51.2
2/18/20			1	1								
Count	26	26	27	27	4	4	26	26	26	26	26	26
Minimum	1.86	13.2	0.52	0.73	ND	ND	0.30	0.45	0.79	0.93	7.8	33.4
Average	151	659	1.07	1.24	0.02	0.05	0.78	2.11	1.90	3.44	117	776
Maximum	1459	3630	1.92	1.93	0.018	0.081	2.75	10.3	6.99	14.7	878	4160

Table 1. Continued

Sample Date	D-Lead ug/L	T-Lead ug/L	D-Manganese ug/L	T-Manganese ug/L	T-Mercury ng/L	D-Nickel ug/L	T-Nickel ug/L	D-Selenium ug/L	T-Selenium ug/L	D-Silver ug/L	T-Silver ug/L	D-Zinc ug/L	T-Zinc ug/L
1/10/05	0.045	0.144	1.38	10.5	ND	1.02	1.6	0.29	0.3	<0.003	0.003	1.67	3.91
2/2/05	0.021	0.075	1.11	7.66	ND	0.9	1.32	ND	ND	<0.001	0.003	1.64	3.15
3/9/05	0.012	0.072	0.64	6.24	ND	0.77	1.2	ND	0.22	<0.001	ND	0.41	2.48
1/4/06	0.575	1.51	10.7	113	ND	2.94	12.2	ND	0.35	<0.001	0.015	7.63	18.8
1/24/06	0.048	0.147	7.25	15.6	ND	1.46	2.11	ND	0.19	<0.005	ND	2.49	3.76
2/21/06	ND	0.049	2.37	5.71	ND	1.53	1.62	ND	0.15	<0.009	ND	1.45	1.89
3/1/06	0.274	1.1	13.5	78.9	ND	2.84	8.57	ND	0.16	<0.009	ND	4.49	13.2
1/10/07	ND	ND	1.37	3.13	0.59	0.97	1.02	ND	ND	<0.03	ND	0.71	2.82
2/26/07	0.149	0.234	6.41	10.2	2.6	1.14	1.49	0.2	0.28	<0.03	ND	3.09	5.68
3/21/07	ND	0.04	1.27	4.8	ND	0.84	0.97	ND	0.2	<0.03	ND	0.38	3.58
1/22/08	ND	0.13	0.73	12.9	ND	0.91	1.08	ND	ND	<0.03	ND	1.33	4.99
2/26/08	ND	0.388	0.68	23.4	ND	1.58	3	ND	0.21	<0.03	ND	0.97	6.85
3/25/08	ND	ND	0.36	6.12	ND	0.71	0.95	ND	0.25	<0.03	ND	0.44	3.11
2/23/09	ND	2.25	1.33	133	ND	1.44	9.9	ND	ND	<0.03	ND	1.28	26
1/25/10	0.069	3.14	1.91	144	ND	13.2	15.7	0.26	0.88	<0.03	0.099	0.76	0.88
2/1/10	ND	0.245	0.74	17.2	ND	1.9	2.01	ND	ND	<0.03	ND	2.09	8.08
3/1/10	ND	0.338	0.88	23.1	ND	0.96	2.44	0.2	0.21	<0.03	ND	0.99	6.09
3/23/10	ND	ND	0.52	3.24	ND	0.6	0.67	0.51	0.61	<0.03	ND	0.19	1.99
1/19/11	ND	0.172	0.86	12.2	ND	1.17	1.38	0.22	0.24	<0.03	ND	1.62	4.38
1/31/11	ND	ND	0.58	5.32	ND	0.81	0.98	ND	ND	<0.03	ND	2.32	4.08
2/5/13	ND	0.055	0.32	4.75	1.2	0.52	0.8	ND	ND	<0.03	ND	1.19	2.84
2/3/14	ND	ND	2.66	4.57	0.7	0.43	0.5	ND	ND	<0.03	ND	0.65	1.09
2/3/15	ND	0.166	0.19	4.75	3.4	0.93	1.3	ND	ND	<0.03	ND	0.88	4.43
2/8/16	ND	0.065	0.32	6.73	1.5	0.82	1.19	0.25	0.28	<0.03	ND	0.94	2.53
2/6/17	ND	0.575	2.78	31.1	ND	1.41	3.09	ND	0.26	<0.03	ND	0.78	7.37
2/13/18	ND	ND	0.34	3.16	ND	1.32	1.7	ND	ND	<0.03	ND	0.29	0.56
2/18/20													
Count	8	20	26	26	6	26	26	7	16	0	4	26	26
Minimum	ND	ND	0.19	3.13	ND	0.43	0.50	ND	ND	ND	ND	0.19	0.56
Average	0.149	0.54	2.35	27	1.7	1.7	3.0	0	0	ND	0	1.56	6
Maximum	0.575	3.14	13.5	144	3.4	13.2	15.7	0.5	0.88	ND	0.099	7.63	26

Table 2. Water Quality Data from the Sacramento River at Hamilton City during the Primary Diversion Period of January through March (D=dissolved, T=total)

Sample Date	D-Aluminum µg/L	T-Aluminum µg/L	D-Arsenic µg/L	T-Arsenic µg/L	D-Cadmium µg/L	T-Cadmium µg/L	D-Chromium µg/L	T-Chromium µg/L	D-Copper µg/L	T-Copper µg/L	D-Iron µg/L	T-Iron µg/L
1/10/05	352	413	1.48	1.55	<0.011	<0.007	1.06	1.44	1.98	2.45	225	443
2/2/05	77.5	163	1.42	1.51	<0.011	<0.066	1.67	1.88	1.53	1.73	71.5	223
3/10/05	11	75.7	2.03	2.08	<0.033	<0.011	1.29	1.39	1.09	1.37	<3.34	118
1/4/06	866	3462	1.61	2.35	0.014	0.092	2.61	9.74	2.47	11.2	569	4787
1/24/06	359	709	1.41	1.49	0.011	0.042	1.51	2.4	1.62	2.92	214	923
2/21/06	222	733	1.3	1.47	0.014	0.029	1.18	2.34	1.12	2.55	139	913
3/1/06	2887	4955	1.36	1.85	0.021	0.087	4.99	11.2	4.26	11.5	1773	6116
1/9/07	61.6	138	2.08	2.23	<0.1	<0.1	0.66	0.69	0.9	1.04	46.3	79.1
2/26/07	478	657	1.31	1.42	<0.1	<0.1	1.81	1.91	2.99	3.9	591	916
3/20/07	16.1	91.6	2.17	2.36	<0.1	<0.1	0.41	0.71	1.22	1.55	26.6	154
2/20/08	5.62	85.8	2.04	2.27	<0.1	<0.1	0.49	0.78	1.09	1.26	7.4	105
2/24/09	51.1	3110	1.62	4.07	<0.1	<0.1	0.47	7.07	2.03	8.21	68.6	3210
2/2/10	12	340	1.37	1.43	<0.1	<0.1	0.36	1.05	1.76	3.65	17.1	383
2/1/11	5.73	53.6	1.9	1.96	<0.1	<0.1	0.43	0.55	1.29	1.41	12	59.6
1/31/12	178	276	2.04	2.2	<0.1	<0.1	0.52	0.6	1	1.33	94.1	162
2/6/13	3.6	127	1.98	2	<0.1	<0.1	0.32	0.75	1.1	1.32	8.2	124
2/4/14	0.19	6.03	2.7	2.88	<0.1	<0.1	0.52	1.31	0.72	0.85	6.2	26.2
2/10/15	21.2	1960	1	2.14	<0.1	<0.1	0.33	5.3	1.96	8	63.2	2100
2/3/16	39.7	352	1.26	1.49	<0.1	<0.1	0.44	1.73	1.15	2.14	42.8	349
2/6/17	136	1020	1.16	1.67	<0.1	<0.1	0.52	3.85	1.79	5.78	138	1100
Count	20	20	20	20	20	20	20	20	20	20	20	20
Minimum	0.19	6.03	1.00	1.42	0.011	0.029	0.32	0.55	0.72	0.85	6.2	26.2
Average	289	936	1.66	2.02	0.02	0.06	1.08	2.83	1.65	3.71	216	1115
Maximum	2887	4955	2.7	4.07	0.021	0.092	4.99	11.2	4.26	11.5	1773	6116

Table 2. Continued

Sample Date	D-Lead µg/L	T-Lead µg/L	D-Manganese µg/L	T-Manganese µg/L	T-Mercury ng/L	D-Nickel µg/L	T-Nickel µg/L	D-Selenium µg/L	T-Selenium µg/L	D-Silver µg/L	T-Silver µg/L	D-Zinc µg/L	T-Zinc µg/L
1/10/05	0.064	0.168	2.22	12.4	N/A	1.39	1.98	0.3	0.34	<0.003	<0.002	1.54	3.1
2/2/05	0.029	0.084	2.54	10.6	N/A	1.02	1.53	<0.222	0.27	0.002	0.003	0.95	1.96
3/10/05	0.008	0.049	0.98	6.37	N/A	0.87	1.24	<0.245	<0.19	<0.001	<0.036	0.36	1.06
1/4/06	0.191	1.89	9.75	134	N/A	2.67	15.4	<0.149	0.22	<0.001	0.021	2.24	20.8
1/24/06	0.062	0.306	9.24	32.4	N/A	1.68	3.32	<0.186	0.19	<0.005	<0.005	1.55	4.71
2/21/06	0.046	0.299	5.83	27.5	N/A	1.53	3.32	<0.149	0.3	<0.009	<0.009	1	3.94
3/1/06	0.648	2.04	23.2	146	N/A	4.69	15.7	<0.149	0.29	<0.009	<0.009	5.79	21.7
1/9/07	<0.04	<0.04	2.22	5.24	0.68	1.01	1.08	<0.2	<0.2	<0.03	<0.03	0.64	2.57
2/26/07	0.262	0.581	10.3	28.8	2.8	2.22	2.99	<0.2	0.23	<0.03	<0.03	3.68	8.39
3/20/07	<0.04	0.056	2.01	8.22	1.6	0.85	1.22	<0.2	<0.2	<0.03	<0.03	0.31	2.82
2/20/08	<0.04	0.041	0.7	8.15	N/A	0.88	0.95	<0.2	0.22	<0.03	<0.03	0.71	3.31
2/24/09	<0.04	1.47	1.28	101	N/A	2.59	11	0.2	0.25	<0.03	<0.03	0.52	14.3
2/2/10	<0.04	0.188	1.01	17.1	N/A	1.78	2.08	<0.2	<0.2	<0.03	<0.03	1.39	5.43
2/1/11	<0.04	<0.04	0.67	6.4	N/A	0.71	0.9	<0.2	<0.2	<0.03	<0.03	0.76	2.68
1/31/12	<0.04	<0.04	1.87	9.58	N/A	0.68	1.11	<0.2	<0.2	<0.03	<0.03	1.17	2.32
2/6/13	<0.04	<0.04	0.35	5.45	1.3	0.44	0.65	<0.2	<0.2	<0.03	<0.03	0.93	1.45
2/4/14	<0.04	<0.04	0.35	2.17	0.8	0.54	0.69	<0.2	0.21	<0.03	<0.03	0.21	0.97
2/10/15	<0.04	1.52	0.96	59.6	29.1	1.36	6.88	0.26	0.31	<0.03	0.037	0.38	13.9
2/3/16	<0.04	0.204	0.62	17.7	3.5	1.26	2.47	0.21	0.28	<0.03	<0.03	0.75	2.98
2/6/17	<0.04	0.945	3.35	43	N/A	1.08	5.36	0.36	0.37	<0.03	<0.03	0.86	9.16
Count	20	20	20	20	20	20	20	20	20	20	20	20	20
Minimum	0.008	0.041	0.35	2.17	0.68	0.44	0.65	0.2	0.19	0.002	0.003	0.21	0.97
Average	0.16	0.66	3.97	34.08	5.68	1.46	3.99	0.27	0.27	0.00	0.02	1.29	6.38
Maximum	0.648	2.04	23.2	146	29.1	4.69	15.7	0.36	0.37	0.002	0.037	5.79	21.7

Table 3. Water Quality Objectives, Numeric Thresholds, and Exceedances for the Sacramento River below Red Bluff

		Numeric Thresholds Recommended to Implement Objective or Criterion			WDL Data				Evapoconcentrated			
					Dissolved		Total		Dissolved		Total	
Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold ug/L	G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Max	Min	Max	Min	Max	Min	Max	Min
					ug/L		ug/L		ug/L		ug/L	
Aluminum					1459	1.86	3630	13.2	2159	2.75	5372.4	19.5
	Chemical Constituents	California Primary MCL	1,000	G & IS	x		x		x		x	
		California Secondary MCL	200	G & IS	x		x		x		x	
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS							x	
	Tastes and Odors	California Secondary MCL	200	G & IS	x		x		x		x	
	Toxicity - humans	California Public Health Goal for Drinking Water	600	G & IS	x		x		x		x	
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, total (f)	87	IS	x		x		x		x	
		USEPA National Recomm. WQ Criteria, 1-hour avg, total (f)	750	IS	x		x		x		x	
Arsenic					1.92	0.52	1.93	0.73	2.84	0.77	2.8564	1.08
	Chemical Constituents	California Primary MCL	10	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	100	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	0.004	G & IS	x	x	x	x	x	x	x	x
		USEPA National Recomm. WQ Criteria, water & fish consump.	0.018	IS	x	x	x	x	x	x	x	x
		USEPA National Recomm. WQ Criteria, fish consumption	0.14	E & O	x	x	x	x	x	x	x	x
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.023	G & IS	x	x	x	x	x	x	x	x
		USEPA Health Advisory for drinking water	0.02	G & IS	x	x	x	x	x	x	x	x
		California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity	0.05	G & IS	x	x	x	x	x	x	x	x
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	150	IS								
		California Toxics Rule (USEPA), 1-hour average (dissolved)	340	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	36	E								
		California Toxics Rule (USEPA), 1-hour average (dissolved)	69	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	8	O								
		Aquatic Life Protection Objective, daily maximum	32	O								
		Aquatic Life Protection Objective, instantaneous maximum	80	O								
Cadmium					0.02	ND	0.081	ND	0.03	ND	0.11988	ND
	Chemical Constituents	California Primary MCL	5	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	10	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	0.04	G & IS			x				x	
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.023	G & IS			x		x		x	
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (l)	1.1	IS								
		California Toxics Rule (USEPA), 1-hour average, dissolved (l)	1.6	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	9.3	E & O								
		California Toxics Rule (USEPA), 1-hour average, dissolved	42	E & O								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	1	O								
		Aquatic Life Protection Objective, daily maximum	4	O								
		Aquatic Life Protection Objective, instantaneous maximum	10	O								
Chromium (III)					2.75	0.3	10.3	0.45	4.07	0.44	15.244	0.67
	Chemical Constituents	California Primary MCL (total chromium)	50	G & IS								
	Toxicity - humans	USEPA IRIS Reference Dose (c)	10,500	G & IS								
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.07	G & IS	x	x	x	x	x	x	x	x
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, dissolved (l)	84	IS								
		National Toxics Rule (USEPA), 1-hour average, dissolved (l)	260	IS								
	CA Ocean Plan - humans	Human Health Protection Objective, fish consumption	190,000	O								
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, acute tox info / 10	1,030	E & O								

Table 3. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion		G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	WDL Data				Evapoconcentrated			
		Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold ug/L		Dissolved		Total		Dissolved		Total	
					Max	Min	Max	Min	Max	Min	Max	Min
					ug/L		ug/L		ug/L		ug/L	
Copper					6.99	0.79	14.7	0.93	10.3	1.17	21.756	1.38
	Chemical Constituents	California Primary MCL	1,300	G & IS								
		California Secondary MCL	1,000	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS								
	Tastes and Odors	California Secondary MCL & USEPA Nat. Rec. WQ Criteria	1,000	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	300	G								
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	1300	IS								
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (I)	4.1	IS	x		x		x		x	
		California Toxics Rule (USEPA), 1-hour average, dissolved (I)	5.7	IS	x		x		x		x	
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	3.1	E	x		x		x		x	
		California Toxics Rule (USEPA), 1-hour average, dissolved	4.8	E	x		x		x		x	
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	3	O	x		x		x		x	
		Aquatic Life Protection Objective, daily maximum	12	O			x				x	
		Aquatic Life Protection Objective, instantaneous maximum	30	O								
Iron					878	7.8	4160	33.4	1299	11.5	6156.8	49.4
	Chemical Constituents	California Secondary MCL	300	G & IS	x		x		x		x	
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS							x	
	Tastes and Odors	California Secondary MCL	300	G & IS	x		x		x		x	
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day average	1,000	IS			x		x		x	
Lead					0.58	ND	3.14	ND	0.85	ND	4.6472	ND
	Chemical Constituents	California Primary MCL	15	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	0.2	G & IS	x		x		x		x	
		California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity	0.25	G & IS	x		x		x		x	
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (I)	0.92	IS			x				x	
		California Toxics Rule (USEPA), 1-hour average, dissolved (I)	24	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8.1	E								
		California Toxics Rule (USEPA), 1-hour average, dissolved	210	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	2	O			x				x	
		Aquatic Life Protection Objective, daily maximum	8	O								
		Aquatic Life Protection Objective, instantaneous maximum	20	O								
Manganese					13.5	0.19	144	3.13	20	0.28	213.12	4.63
	Chemical Constituents	California Secondary MCL	50	G & IS			x				x	
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS							x	
	Tastes and Odors	California Secondary MCL	50	G & IS			x				x	
	Toxicity - humans	California DPH Notification Level for drinking water	500	G & IS								
		USEPA National Recomm. WQ Criteria, fish consumption	100	IS & E & O			x				x	
Mercury							0.0034	ND			0.00503	ND
	Chemical Constituents	California Primary MCL	2	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	1.2	G								
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	0.05	IS								
		California Toxics Rule (USEPA) for other waters	0.051	IS & E								
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	0.77	IS								
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	1.4	IS								
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	0.94	E & O								
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	1.8	E & O								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	0.04	O								
		Aquatic Life Protection Objective, daily maximum	0.16	O								
		Aquatic Life Protection Objective, instantaneous max	0.4	O								

Table 3. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion: Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold ug/L	G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	WDL Data: Dissolved Max (ug/L)	WDL Data: Dissolved Min (ug/L)	WDL Data: Total Max (ug/L)	WDL Data: Total Min (ug/L)	Evapoconcentrated: Dissolved Max (ug/L)	Evapoconcentrated: Dissolved Min (ug/L)	Evapoconcentrated: Total Max (ug/L)	Evapoconcentrated: Total Min (ug/L)
Nickel					13.2	0.43	15.7	0.5	19.5	0.64	23.2	0.74
	Chemical Constituents	California Primary MCL	100	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	12	G	x		x		x		x	
		USEPA National Recomm. WQ Criteria, fish consumption	4,600	IS & E & O								
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	610	IS								
		California Toxics Rule (USEPA) for other waters	4,600	IS & E								
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (l)	24	IS								
		California Toxics Rule (USEPA), 1-hour average, dissolved (l)	220	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8	E	x		x		x		x	
		California Toxics Rule (USEPA), 1-hour average, dissolved	74	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	5	O	x		x		x		x	
		Aquatic Life Protection Objective, daily maximum	20	O							x	
		Aquatic Life Protection Objective, instantaneous maximum	50	O								
Selenium					0.51	ND	0.88	ND	0.75	ND	1.30	
	Chemical Constituents	California Primary MCL	50	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	20	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	30	G & IS								
		USEPA National Recomm. WQ Criteria, water & fish consump.	170	IS								
		USEPA National Recomm. WQ Criteria, fish consumption	4,200	E & O								
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, total	5	IS								
		National Toxics Rule (USEPA), 1-hour average, total	20	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	71	E								
		California Toxics Rule (USEPA), 1-hour average, dissolved	290	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	15	O								
		Aquatic Life Protection Objective, daily maximum	60	O								
		Aquatic Life Protection Objective, instantaneous maximum	150	O								
Zinc					7.63	0.19	26	0.56	11.3	0.28	38.5	0.83
	Chemical Constituents	California Secondary MCL	5,000	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	2,000	G & IS								
	Tastes and Odors	California Secondary MCL	5,000	G & IS								
	Toxicity - humans	USEPA IRIS Reference Dose (c)	2,100	G & IS								
		USEPA National Recomm. WQ Criteria, water & fish consump.	7,400	IS								
		USEPA National Recomm. WQ Criteria, fish consumption	26,000	E & O								
	CTR - fw aquatic life	California Toxics Rule (USEPA), 1-hour average, dissolved (l)	54	IS								
		California Toxics Rule (USEPA), 4-day average, dissolved (l)	54	IS								
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	81	E & O								
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	90	E & O								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective for Lead, 6-month median	20	O			x				x	
		Aquatic Life Protection Objective for Lead, daily maximum	80	O								
		Aquatic Life Protection Objective for Lead, instantaneous max	200	O								

Table 4. Water Quality Objectives, Numeric Thresholds, and Exceedances for the Sacramento River at Hamilton City

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion: Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold ug/L		WDL Data Dissolved Max (ug/L)	WDL Data Dissolved Min (ug/L)	WDL Data Total Max (ug/L)	WDL Data Total Min (ug/L)	Evapoconcentrated Dissolved Max (ug/L)	Evapoconcentrated Dissolved Min (ug/L)	Evapoconcentrated Total Max (ug/L)	Evapoconcentrated Total Min (ug/L)
Aluminum					2887	0.19	4955	6.03	4273	0.28	7333	8.92
	Chemical Constituents	California Primary MCL	1,000	G & IS	x		x		x		x	
		California Secondary MCL	200	G & IS	x		x		x		x	
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS							x	
	Tastes and Odors	California Secondary MCL	200	G & IS	x		x		x		x	
	Toxicity - humans	California Public Health Goal for Drinking Water	600	G & IS	x		x		x		x	
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, total (f)	87	IS	x		x		x		x	
		USEPA National Recomm. WQ Criteria, 1-hour avg, total (f)	750	IS	x		x		x		x	
Arsenic					2.7	1.00	4.07	1.42	4.0	1.48	6.02	2.10
	Chemical Constituents	California Primary MCL	10	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	100	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	0.004	G & IS	x	x	x	x	x	x	x	x
		USEPA National Recomm. WQ Criteria, water & fish consump.	0.018	IS	x	x	x	x	x	x	x	x
		USEPA National Recomm. WQ Criteria, fish consumption	0.14	E & O	x	x	x	x	x	x	x	x
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.023	G & IS	x	x	x	x	x	x	x	x
		California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity	0.05	G & IS	x	x	x	x	x	x	x	x
		USEPA IRIS Reference Dose Drinking Water Health Advisories	2.1	G & IS	x		x		x		x	x
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	150	IS								
		California Toxics Rule (USEPA), 1-hour average (dissolved)	340	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	36	E								
		California Toxics Rule (USEPA), 1-hour average (dissolved)	69	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	8	O								
		Aquatic Life Protection Objective, daily maximum	32	O								
		Aquatic Life Protection Objective, instantaneous maximum	80	O								
Cadmium					0.021	ND	0.092	ND	0.031	ND	0.136	ND
	Chemical Constituents	California Primary MCL	5	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	10	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	0.04	G & IS			x				x	
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.0023	G & IS	x		x		x		x	
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (l)	1.1	IS								
		California Toxics Rule (USEPA), 1-hour average, dissolved (l)	1.6	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	9.3	E & O								
		California Toxics Rule (USEPA), 1-hour average, dissolved	42	E & O								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	1	O								
		Aquatic Life Protection Objective, daily maximum	4	O								
		Aquatic Life Protection Objective, instantaneous maximum	10	O								

Table 4. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion: Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold ug/L		WDL Data Dissolved Max (ug/L)	WDL Data Dissolved Min (ug/L)	WDL Data Total Max (ug/L)	WDL Data Total Min (ug/L)	Evapoconcentrated Dissolved Max (ug/L)	Evapoconcentrated Dissolved Min (ug/L)	Evapoconcentrated Total Max (ug/L)	Evapoconcentrated Total Min (ug/L)
Chromium (III)					4.99	0.32	11.2	0.55	7.39	0.47	16.6	0.814
	Chemical Constituents	California Primary MCL (total chromium)	50	G & IS								
	Toxicity - humans	USEPA IRIS Reference Dose (c)	10,500	G & IS								
		Cal EPA/OEHHA - California Public Health Goal	0.02	G & IS	x	x	x	x	x	x	x	x
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.07	G & IS	x	x	x	x	x	x	x	x
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, dissolved (l)	84	IS								
		National Toxics Rule (USEPA), 1-hour average, dissolved (l)	260	IS								
	CA Ocean Plan - humans	Human Health Protection Objective, fish consumption	190,000	O								
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, acute tox info / 10	1,030	E & O								
Copper					4.26	0.72	11.5	0.85	6.30	1.07	17.0	1.258
	Chemical Constituents	California Primary MCL	1,300	G & IS								
		California Secondary MCL	1,000	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS								
	Tastes and Odors	California Secondary MCL & USEPA Nat. Rec. WQ Criteria	1,000	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	300	G								
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	1300	IS								
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (l)	4.1	IS	x		x		x		x	
		California Toxics Rule (USEPA), 1-hour average, dissolved (l)	5.7	IS			x		x		x	
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	3.1	E	x		x		x		x	
		California Toxics Rule (USEPA), 1-hour average, dissolved	4.8	E			x		x		x	
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	3	O	x		x		x		x	
		Aquatic Life Protection Objective, daily maximum	12	O							x	
		Aquatic Life Protection Objective, instantaneous maximum	30	O								
Iron					1773	6.2	6116	26.2	2624	9.18	9052	38.8
	Chemical Constituents	California Secondary MCL	300	G & IS	x		x		x		x	
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS			x				x	
	Tastes and Odors	California Secondary MCL	300	G & IS	x		x		x		x	
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day average	1,000	IS	x		x		x		x	
Lead					0.648	0.008	2.04	0.041	0.959	ND	3.02	ND
	Chemical Constituents	California Primary MCL	15	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	0.2	G & IS	x		x		x		x	
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.2	G & IS	x		x		x		x	
		California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity	0.25	G & IS	x		x		x		x	
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (l)	0.92	IS			x		x		x	
		California Toxics Rule (USEPA), 1-hour average, dissolved (l)	24	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8.1	E								
		California Toxics Rule (USEPA), 1-hour average, dissolved	210	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	2	O			x				x	
		Aquatic Life Protection Objective, daily maximum	8	O								
		Aquatic Life Protection Objective, instantaneous maximum	20	O								

Table 4. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion: Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold ug/L		WDL Data				Evapoconcentrated			
					Dissolved		Total		Dissolved		Total	
					Max	Min	Max	Min	Max	Min	Max	Min
					ug/L		ug/L		ug/L		ug/L	
Manganese					23.2	0.35	146	2.17	34.3	0.52	216	3.21
	Chemical Constituents	California Secondary MCL	50	G & IS			x				x	
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS							x	
	Tastes and Odors	California Secondary MCL	50	G & IS			x				x	
	Toxicity - humans	California DPH Notification Level for drinking water	500	G & IS								
		USEPA National Recomm. WQ Criteria, fish consumption	100	S & E & O			x				x	
Mercury							0.029	######			0.0431	0.00101
	Chemical Constituents	California Primary MCL	2	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	1.2	G								
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	0.05	IS								
		California Toxics Rule (USEPA) for other waters	0.051	IS & E								
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	0.77	IS								
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	1.4	IS								
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	0.94	E & O								
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	1.8	E & O								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	0.04	O								
		Aquatic Life Protection Objective, daily maximum	0.16	O								
		Aquatic Life Protection Objective, instantaneous max	0.4	O								
Nickel					4.69	0.44	15.7	0.65	6.94	0.65	23.2	0.96
	Chemical Constituents	California Primary MCL	100	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	12	G			x				x	
		USEPA National Recomm. WQ Criteria, fish consumption	4,600	S & E & O								
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	610	IS								
		California Toxics Rule (USEPA) for other waters	4,600	IS & E								
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (l)	24	IS								
		California Toxics Rule (USEPA), 1-hour average, dissolved (l)	220	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8	E			x				x	
		California Toxics Rule (USEPA), 1-hour average, dissolved	74	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	5	O			x		x		x	
		Aquatic Life Protection Objective, daily maximum	20	O							x	
		Aquatic Life Protection Objective, instantaneous maximum	50	O								
Selenium					0.36	0.20	0.37	0.19	0.53	ND	0.55	ND
	Chemical Constituents	California Primary MCL	50	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	20	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	30	G & IS								
		USEPA National Recomm. WQ Criteria, water & fish consump.	170	IS								
		USEPA National Recomm. WQ Criteria, fish consumption	4,200	E & O								
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, total	5	IS								
		National Toxics Rule (USEPA), 1-hour average, total	20	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	71	E								
		California Toxics Rule (USEPA), 1-hour average, dissolved	290	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	15	O								
		Aquatic Life Protection Objective, daily maximum	60	O								
		Aquatic Life Protection Objective, instantaneous maximum	150	O								

Table 4. Continued

		Numeric Thresholds Recommended to Implement Objective or Criterion										
					WDL Data				Evapoconcentrated			
					Dissolved		Total		Dissolved		Total	
					Max	Min	Max	Min	Max	Min	Max	Min
Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold ug/L		ug/L		ug/L		ug/L		ug/L	
Zinc					5.79	0.21	21.7	0.97	8.5692	0.31	32.1	1.44
	Chemical Constituents	California Secondary MCL	5,000	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	2,000	G & IS								
	Tastes and Odors	California Secondary MCL	5,000	G & IS								
	Toxicity - humans	USEPA IRIS Reference Dose (c)	2,100	G & IS								
		USEPA National Recomm. WQ Criteria, water & fish consump.	7,400	IS								
		USEPA National Recomm. WQ Criteria, fish consumption	26,000	E & O								
	CTR - fw aquatic life	California Toxics Rule (USEPA), 1-hour average, dissolved (l)	54	IS								
		California Toxics Rule (USEPA), 4-day average, dissolved (l)	54	IS								
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	81	E & O								
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	90	E & O								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective for Lead, 6-month median	20	O			x				x	
		Aquatic Life Protection Objective for Lead, daily maximum	80	O								
		Aquatic Life Protection Objective for Lead, instantaneous max	200	O								

Table 5 Projected Metals Concentrations

	Sample Date	D-Aluminum ug/L	T-Aluminum ug/L	D-Arsenic ug/L	T-Arsenic ug/L	D-Cadmium ug/L	T-Cadmium ug/L	D-Chromium ug/L	T-Chromium ug/L
Cottonwood Creek	3/1/06	2533	3739	0.889	1.16	0.009	0.023	8.2	15.7
Sacramento R below Red Bluff	3/1/06	1459	2240	0.857	1.06	0.017	0.055	2.75	6.1
Multiplication Factor (SacR/CottonwoodCr)		0.6	0.6	1.0	0.9	1.9	2.4	0.3	0.4
Maximum Cotonwood Creek Concentration		2533	14345	0.889	3.04	0.009	0.085	8.2	36.5
Projected Maximum Sacramento River Concentration		1459	8594	0.857	2.78	0.017	0.203	2.75	14.2
Sites Reservoir Concentration after Evapoconcentration (48 percent)		2159	12719	1.27	4.11	0.025	0.30	4.07	21.0
Sacramento River at Hamilton City (May throughSeptember, WDL)		1075	6686	2.36	3.17	0.007	0.076	2.69	18.9
Effects of Sites Reservoir Releases on Water Qualityin the Sacramento River at Hamilton City		1216	7470	2.22	3.29	0.009	0.105	2.87	19.17

	Sample Date	D-Copper ug/L	T-Copper ug/L	D-Iron ug/L	T-Iron ug/L	D-Lead ug/L	T-Lead ug/L	D-Manganese ug/L	T-Manganese ug/L
Cottonwood Creek	3/1/06	3.22	7.63	1760	5793	0.491	1.53	30.8	138
Sacramento R below Red Bluff	3/1/06	2.59	6.09	878	2854	0.274	1.1	13.5	78.9
Multiplication Factor (SacR/CottonwoodCr)		0.8	0.8	0.5	0.5	0.6	0.7	0.4	0.6
Maximum Cotonwood Creek Concentration		4.43	39.2	1760	23594	0.491	7.26	30.8	563
Projected Maximum Sacramento River Concentration		3.56	31.29	878	11624	0.274	5.2	13.5	322
Sites Reservoir Concentration after Evapoconcentration (48 percent)		5.27	46.3	1299	17203	0.41	7.7	20.0	476
Sacramento River at Hamilton City (May throughSeptember, WDL)		3.11	18.7	726	10052	0.202	3.24	7.33	272
Effects of Sites Reservoir Releases on Water Qualityin the Sacramento River at Hamilton City		3.39	22.29	801	10982	0.228	3.82	8.97	299

	Sample Date	D-Nickel ug/L	T-Nickel ug/L	D-Selenium ug/L	T-Selenium ug/L	D-Silver ug/L	T-Silver ug/L	D-Zinc ug/L	T-Zinc ug/L
Cottonwood Creek	3/1/06	7.35	20.9	0	0.15	ND	ND	3.64	13.6
Sacramento R below Red Bluff	3/1/06	2.84	8.57	0	0.16	ND	ND	4.49	13.2
Multiplication Factor (SacR/CottonwoodCr)		0.4	0.4	1.0	1.1	-	-	1.2	1.0
Maximum Cotonwood Creek Concentration		7.35	57.9	0.74	0.81	0.039	0.101	3.64	72
Projected Maximum Sacramento River Concentration		2.84	23.7	0.74	0.86	-	-	4.49	70
Sites Reservoir Concentration after Evapoconcentration (48 percent)		4.20	35.1	1.10	1.28	-	-	6.65	103
Sacramento River at Hamilton City (May throughSeptember, WDL)		2.75	10.7	0.34	0.35	0.018	2.11	2.46	35

Table 6. Projected metals concentrations in the Sacramento River at Hamilton City and CBD with dilution of Sites Reservoir water in the respective water bodies

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion: Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold	Units	G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Sacramento River at Hamilton City: Dissolved	Sacramento River at Hamilton City: Total	Colusa Basin Drain: Dissolved	Colusa Basin Drain: Total
Aluminum						1216	7470	338	2542
	Chemical Constituents	California Primary MCL	1,000	ug/L	G & IS	x	x		x
		California Secondary MCL	200	ug/L	G & IS	x	x		x
		Water Quality for Agriculture (Ayers & Westcot)	5,000	ug/L	G & IS		x		
	Tastes and Odors	California Secondary MCL	200	ug/L	G & IS	x	x		x
	Toxicity - humans	California Public Health Goal for Drinking Water	600	ug/L	G & IS	x	x		x
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, total (f)	87	ug/L	IS	x	x		x
		USEPA National Recomm. WQ Criteria, 1-hour avg, total (f)	750	ug/L	IS	x	x		x
Arsenic						2.22	3.29	3.85	4.67
	Chemical Constituents	California Primary MCL	10	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	100	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	0.004	ug/L	G & IS	x	x	x	x
		USEPA National Recomm. WQ Criteria, water & fish consump.	0.018	ug/L	IS	x	x	x	x
		USEPA National Recomm. WQ Criteria, fish consumption	0.14	ug/L	E & O	x	x	x	x
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	150	ug/L	IS				
		California Toxics Rule (USEPA), 1-hour average (dissolved)	340	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	36	ug/L	E				
		California Toxics Rule (USEPA), 1-hour average (dissolved)	69	ug/L	E				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	8	ug/L	O				
		Aquatic Life Protection Objective, daily maximum	32	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	80	ug/L	O				
Cadmium						0.009	0.105	0.054	0.089
	Chemical Constituents	California Primary MCL	5	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	10	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	0.04	ug/L	G & IS		x		
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (l)	1.1	ug/L	IS				
		California Toxics Rule (USEPA), 1-hour average, dissolved (l)	1.6	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	9.3	ug/L	E & O				
		California Toxics Rule (USEPA), 1-hour average, dissolved	42	ug/L	E & O				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	1	ug/L	O				
		Aquatic Life Protection Objective, daily maximum	4	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	10	ug/L	O				
Chromium (III)						2.87	19.17	1.14	5.95
	Chemical Constituents	California Primary MCL (total chromium)	50	ug/L	G & IS				
	Toxicity - humans	USEPA IRIS Reference Dose (c)	10,500	ug/L	G & IS				
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, dissolved (l)	84	ug/L	IS				
		National Toxics Rule (USEPA), 1-hour average, dissolved (l)	260	ug/L	IS				
	CA Ocean Plan - humans	Human Health Protection Objective, fish consumption	190,000	ug/L	O				
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, acute tox info / 10	1,030	ug/L	E & O				
Copper						3.39	22.29	3.24	11
	Chemical Constituents	California Primary MCL	1,300	ug/L	G & IS				
		California Secondary MCL	1,000	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	200	ug/L	G & IS				
	Tastes and Odors	California Secondary MCL & USEPA Nat. Rec. WQ Criteria	1,000	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	300	ug/L	G				
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	1300	ug/L	IS				
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (l)	4.1	ug/L	IS		x		x
		California Toxics Rule (USEPA), 1-hour average, dissolved (l)	5.7	ug/L	IS		x		x
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	3.1	ug/L	E	x	x		x
		California Toxics Rule (USEPA), 1-hour average, dissolved	4.8	ug/L	E		x		x
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	3	ug/L	O	x	x	x	x
		Aquatic Life Protection Objective, daily maximum	12	ug/L	O		x		
		Aquatic Life Protection Objective, instantaneous maximum	30	ug/L	O				
Iron						801	10982	260	3580
	Chemical Constituents	California Secondary MCL	300	ug/L	G & IS	x	x		x
		Water Quality for Agriculture (Ayers & Westcot)	5,000	ug/L	G & IS		x		
	Tastes and Odors	California Secondary MCL	300	ug/L	G & IS	x	x		x
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day average	1,000	ug/L	IS		x		x

Table 6. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion: Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold ug/L	Units	G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Sacramento River at Hamilton City: Dissolved	Sacramento River at Hamilton City: Total	Colusa Basin Drain: Dissolved	Colusa Basin Drain: Total
Lead						0.228	3.82	0.106	1.68
	Chemical Constituents	California Primary MCL	15	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	5,000	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	0.2	ug/L	G & IS	x	x		x
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (I)	0.92	ug/L	IS	x	x		x
		California Toxics Rule (USEPA), 1-hour average, dissolved (I)	24	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8.1	ug/L	E				
		California Toxics Rule (USEPA), 1-hour average, dissolved	210	ug/L	E				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	2	ug/L	O		x		
		Aquatic Life Protection Objective, daily maximum	8	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	20	ug/L	O				
Manganese						8.97	299	14.9	208
	Chemical Constituents	California Secondary MCL	50	ug/L	G & IS		x		x
		Water Quality for Agriculture (Ayers & Westcot)	200	ug/L	G & IS		x		x
	Tastes and Odors	California Secondary MCL	50	ug/L	G & IS		x		x
	Toxicity - humans	California DPH Notification Level for drinking water	500	ug/L	G & IS				
		USEPA National Recomm. WQ Criteria, fish consumption	100	ug/L	IS & E & O		x		x
Nickel						2.94	13.88	3.33	11.2
	Chemical Constituents	California Primary MCL	100	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	200	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	12	ug/L	G		x		
		USEPA National Recomm. WQ Criteria, fish consumption	4,600	ug/L	IS & E & O				
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	610	ug/L	IS				
		California Toxics Rule (USEPA) for other waters	4,600	ug/L	IS & E				
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (I)	24	ug/L	IS				
		California Toxics Rule (USEPA), 1-hour average, dissolved (I)	220	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8	ug/L	E		x		x
		California Toxics Rule (USEPA), 1-hour average, dissolved	74	ug/L	E				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	5	ug/L	O		x		x
		Aquatic Life Protection Objective, daily maximum	20	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	50	ug/L	O				
Selenium						0.438	0.47	0.516	0.627
	Chemical Constituents	California Primary MCL	50	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	20	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	30	ug/L	G & IS				
		USEPA National Recomm. WQ Criteria, water & fish consump.	170	ug/L	IS				
		USEPA National Recomm. WQ Criteria, fish consumption	4,200	ug/L	E & O				
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, total	5	ug/L	IS				
		National Toxics Rule (USEPA), 1-hour average, total	20	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	71	ug/L	E				
		California Toxics Rule (USEPA), 1-hour average, dissolved	290	ug/L	E				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	15	ug/L	O				
		Aquatic Life Protection Objective, daily maximum	60	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	150	ug/L	O				
Zinc						3	43.9	1.56	19.1
	Chemical Constituents	California Secondary MCL	5,000	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	2,000	ug/L	G & IS				
	Tastes and Odors	California Secondary MCL	5,000	ug/L	G & IS				
	Toxicity - humans	USEPA IRIS Reference Dose (c)	2,100	ug/L	G & IS				
		USEPA National Recomm. WQ Criteria, water & fish consump.	7,400	ug/L	IS				
		USEPA National Recomm. WQ Criteria, fish consumption	26,000	ug/L	E & O				
	CTR - fw aquatic life	California Toxics Rule (USEPA), 1-hour average, dissolved (I)	54	ug/L	IS				
		California Toxics Rule (USEPA), 4-day average, dissolved (I)	54	ug/L	IS				
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	81	ug/L	E & O				
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	90	ug/L	E & O				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective for Lead, 6-month median	20	ug/L	O		x		
		Aquatic Life Protection Objective for Lead, daily maximum	80	ug/L	O				
		Aquatic Life Protection Objective for Lead, instantaneous max	200	ug/L	O				

A “Reservoir Management Plan” is identified on page 6-47. The RMP Page 2D-37) states that “past studies of metal concentrations in the Sacramento River have not focused on high flows that will be the source water for Sites Reservoir. Metal concentrations at the diversion(s) will be measured within 24 hours of the start of diversions at RBPP and every 2 weeks during continuous diversions.” “After 2 years of measuring metal concentrations in the diversions, the frequency of measurements will decrease to monthly.” Rather than focusing on a strict protocol or set schedule of monitoring at 2-week intervals, monitoring should target a range of flow conditions to better understand the relationship between flow and metals concentrations. Event based monitoring may require data collection biweekly, weekly, or even on a daily basis as flow conditions vary. Additional consideration for monitoring would include analyzing differences in water quality based on whether flows are primarily composed of water from Shasta Lake or tributary inflows dominate the flow in the Sacramento River at the diversion points, and dry, normal, and wet year effects on water quality. Two years of data collection likely will not be sufficient to provide the required information.

The description of the SWRCB’s Antidegradation Policy on page 6-47 is misleading in stating that the policy allows for some degradation in consideration for increased beneficial uses, the supposed beneficial use being increased water supply from the proposed reservoir. The Antidegradation Policy prohibits discharges that would degrade water quality even though the degradation would not exceed water quality objectives because no capacity would exist for degradation that will be caused by the next downstream or downgradient uses – the ability to beneficially use the water would have been impaired, even though water quality objectives would not yet have been exceeded (SWRCB 2011). The contribution of additional metal loads from releases from the proposed Sites Reservoir during the summer would cause concentrations of metals in the Sacramento River (through direct releases or releases through the CBD or GCID) to exceed criteria and standards or at least be subject to the Antidegradation Policy due to an incremental increase in metals in the Sacramento River from the proposed project. Thus, the proposed project may face prohibition of releases if stored water does not meet water quality criteria or standards or if releases can cause criteria or standards to be exceeded by downstream inputs (i.e., Antidegradation Policy).

On page 6-54, page 6-57, and elsewhere, statements concerning expected mercury levels in fish, nutrients, and dissolved organic carbon in the reservoir explain that “this would be an effect on the Project itself occurring within the Sites Reservoir, rather than an effect from the Project on the surrounding environment.” This seems to imply that the project would not be responsible for these issues in the reservoir since it is the location where the reservoir is placed that is responsible. It is the construction of the reservoir that creates the problem. The creation of the reservoir creates a problem for the surrounding environment (i.e., birds that will prey on fish contaminated with high levels of mercury in the reservoir).

The discussion on page 6-57 also explains that “any increases in reservoir nutrient concentrations may benefit fish.” However, management of the mercury problem in the reservoir includes not introducing fish into the reservoir for at least 10 years (Mitigation Measure WQ-1.1). So, there are not any fish that would benefit from the increased nutrient concentrations in the reservoir. Even if there were fish in the reservoir, increased nutrient concentrations would lead to increased HABs (an impact) and anoxia in the hypolimnion as the organic materials (HABs) produced in the epilimnion sink and decompose in the hypolimnion, eliminating the hypolimnion as habitat for fish (another impact). As well, the anoxic hypolimnion will result in the dissolution of metals from the sediments back into the water column, yet another adverse impact from the increases in reservoir nutrient concentrations.

This section on page 6-54 of the report also acknowledges that long-term methylmercury concentrations in fish in the proposed reservoir can reasonably be expected to be about 0.85 mg/kg ww, which greatly exceeds the 0.2 mg/kg ww of the California sport fish objective.

Because Harmful Algal Blooms (HABs) are expected to be relatively high in surface water of the reservoir (page 6-55), "releases could be made from lower in the water column (e.g., through the low-level intake) to reduce the potential for higher concentrations of cyanobacteria and cyanotoxins to be released downstream." This is proposed as a strategy on page 6-57 to avoid effects from initial filling of Sites Reservoir on downstream conditions. However, a statement on page 6-16 indicates that water would be released from the surface rather than lower in the water column to avoid releasing water with high concentrations of mercury: "Due to this stratification, reservoir releases from the warmer, upper layer of water (i.e., the epilimnion) during the summer are less likely to have elevated methylmercury concentrations compared to releases from the deeper hypolimnion." Water quality is affected whether water is released from the surface (HABs) or bottom (mercury). Neither release scenario, then, is effective at mitigating impacts; releases from the bottom to avoid HABs results in high levels of mercury being released, while releases from the surface to avoid mercury results in high levels of HABs being released. One mitigation strategy conflicts with the other. Withdrawing water between the epilimnion and hypolimnion (i.e., the metalimnion) may avoid releasing water with high HABs (epilimnion) or mercury (hypolimnion), but this narrow band of water would quickly be depleted, leaving no option but to release water with either high concentrations of HABs or mercury.

One of the methylmercury management strategies is to not stock Sites Reservoir with fish for the first 10 years following its initial filling (page 6-59). How will the project prevent someone from taking it upon themselves to stock fish of their choosing, as has happened at many other reservoirs (e.g., Northern pike in the Upper Feather River reservoirs). What will the project do to prevent someone from stocking fish and to mitigate this stocking when it does occur?

Another methylmercury management strategy is to introduce an oxidant, such as nitrate, to the reservoir bottom waters (near the sediment-water interface) to reduce anoxia (page 6-59). "If this method is employed, reservoir releases will be made from a higher tier (i.e., higher elevation) in the I/O tower to avoid discharging bottom waters." Introduction of nitrates will serve as a nutrient source to stimulate increased algal ((HABs) growth following reservoir turnover. Releases from above the hypolimnion will be affected by HABs.

From page 6-70: "Thermal stratification in the summer would likely result in a reduction of oxygen toward the bottom of the reservoir in the hypolimnion. However, reservoir fish would likely not be affected by this reduction because they would not be in the hypolimnion." According to this DEIR, some of the fish species that would be introduced into the reservoir (after 10 years) include cold-water species. These fish require the cold water of the hypolimnion for survival. Reduction of oxygen in the hypolimnion will adversely affect these species.

The DEIR on page 6-81states that "concentrations of metals released from Sites Reservoir could be higher than their concentrations in the Sacramento River at the point of discharge, potentially degrading river water quality." "The release of Sites Reservoir water to the CBD under Alternatives 1, 2, and 3 would likely reduce metals concentrations in the CBD because metal concentrations in the CBD are generally higher than metals concentrations in the Sacramento River regardless of time of year." As discussed earlier, release of water to the CBD from Sites reservoir results in elevated concentrations of most metals in the CBD. However, even if release of water from Sites Reservoir to the CBD did not cause metal concentrations in the CBD to be increased, the total volume of poor quality metal laden water being released to the Sacramento River at the CBD outfall is increased with the introduction of water from Sites Reservoir, thereby causing greater adverse impacts on water quality in the Sacramento River than if just CBD water was released. The additional metals load in CBD due to the addition of water from Sites Reservoir may, when combined with other downstream discharges, result in the need for additional water treatment by downstream users, particularly municipal or industrial users.

The DEIR states on page 6-81 that "high concentrations of total metals in the Sacramento River water diverted to storage may be reduced substantially by settling of suspended sediment. This would cause concentrations to drop and approach the dissolved, filtered measurements." The DEIR does not take in account the dissolution of metals from the settled sediments under the anoxic conditions expected in the reservoir. Dissolution of metals from the settled sediments will add to those already present in the dissolved form. In addition, the DEIR states that evapoconcentration could increase metals concentrations in the reservoir by up to 48 percent.

The DEIR on page 6-82 states that "to demonstrate a range of results for the Sacramento River, these graphs show two types of results for concentrations in the Sacramento River downstream of the Sites discharge: Concentrations assuming median river concentrations mixed with Sites Reservoir concentrations that assume no settling of suspended sediment. This represents typical river concentrations mixed with Sites concentrations that are probably unrealistically high." Sites Reservoir will not be diverting "median" river concentrations, but rather the higher concentrations occurring with higher flows in the January through March period. Throughout this DEIR, comments are made that analyses are "conservative," meaning that the DEIR considers worst case scenarios in the analyses. The analyses are not "conservative" at all, but are an underestimation of the concentration of metals that will occur in the reservoir since the available data does not identify the higher concentration of metals that will occur with higher flows.

The DEIR on page 6-82 states that "the total aluminum, total copper, and total iron concentrations in Sites Reservoir are likely to frequently exceed aquatic life protection standards if settling did not reduce these concentrations." As noted previously, settling of sediments is not a permanent sink for metals in the reservoir. Dissolution of metals under anoxic conditions will allow metals from the sediments to re-enter the water column, which may then lead to even more exceedances of water quality standards for aquatic life protection.

In discussing effects on aquatic communities in the reservoir due to metals, the DEIR on page 6-82 states “these effects would occur on an aquatic community in a reservoir that is not present under existing conditions so there would be no substantial degradation of water quality relative to existing conditions.” Strange statement. There is no degradation under existing conditions without the reservoir, but there are certainly impacts on the aquatic community when the reservoir is constructed. The SWRCB sets water quality standards and objectives that includes reservoirs.

The DEIR on page 6-83 states “acute synergistic metal effects in the river would be greater than what might occur in Sites Reservoir because metal concentrations in the Sacramento River during high flow events are much higher than concentrations expected in Sites Reservoir.” Diversions to Sites Reservoir would occur during high flow events, so metals concentrations in Sites Reservoir would be similar to those in the Sacramento River during these events. The DEIR goes on to state “as described above, once suspended sediment settles in Sites Reservoir, most metals are expected to occur at levels below water quality standards for aquatic life protection, which would limit the likelihood of synergistic effects.” The DEIR considered only four metals, but nonetheless found that “with these assumptions for partial settling, concentrations for total aluminum may be close to the 620 µg/L water quality standard for aquatic life protection, hovering between about 500 µg/L and 750 µg/L” and “total copper concentrations may occasionally exceed water quality standards for aquatic life protection” (page 6-82). This conclusion conflicts with the earlier and does not support the conclusion that most metals are expected to occur at levels below water quality standards for aquatic life protection.

Graphs are presented on pages 6-84 and 6-85 that depict estimated concentrations of various metals going back as far as the year 1920 to the year 2000. There are no metals data for nearly all the years depicted in the graphs, so how were the estimates determined?

The DEIR on page 6-86 states that “arsenic levels measured in the Sacramento River are below regulatory standards.” Arsenic levels in the Sacramento River near Red Bluff as well as at Hamilton City exceed several goals and objectives, including the California Public Health Goal for Drinking Water, USEPA National Recommended WQ Criteria for water and fish consumption, and USEPA National Recommended WQ Criteria for fish consumption. Though not regulatory, these goals are criteria to which arsenic concentrations should be compared to evaluate impacts.

The DEIR states on page 6-88 that “in drought years, releases from the reservoir’s normal operating dead pool would be made through the low-level intake” and on page 6-89 that “if cyanobacteria and cyanotoxins are confirmed near the I/O tower at a level at or exceeding the “Caution” action trigger level, releases could be made from lower in the water column (e.g., through the low-level intake) to reduce the potential for higher concentrations of cyanobacteria and cyanotoxins to be released downstream. This hypolimnial release would result in water with high concentrations of methylmercury being released downstream.

In determining CEQA significance on page 6-92, the DEIR reiterates that “releasing water from lower in the reservoir if cyanobacteria and cyanotoxins are confirmed near the I/O tower at a level at or exceeding the “Caution” action trigger level, would further reduce any potential for adverse water quality effects," which ignores the conflicting issue of high methylmercury concentrations in the lower water. The DEIR on page 6-93 also states that "in the Sacramento River, discharges to the river from Sites Reservoir would occur after reductions in total metal concentrations due to settling of suspended sediment. These discharges would not cause substantial increases in concentration or exceedances or exacerbation of exceedances of water quality standards for metals in the Sacramento River." This ignores the importance of redistribution of metals from the reservoir sediments due to dissolution. Any increases in concentrations or exceedances of water quality standards for metals is a concern for downstream water users, even if not "substantial."

Mitigation for impacts to Stone Corral Creek include "release occasional pulses of high flow. Flow pulses could flush away low-quality sediment and water from the bottom of the reservoir adjacent to Sites Dam." This would flush contaminant laden sediments downstream, resulting in downstream impacts including smothering of aquatic habitat with toxics laden sediments. Adding "a vertical extension in the reservoir at the withdrawal point. This extension would pull water from higher in the reservoir, where metal concentrations are expected to be lower" and "pump water from the top of Sites Reservoir for release into Stone Corral Creek." But HABs are higher in this water that would be supplied from the upper water column of the reservoir – trading one impact for another.

Another mitigation for Stone Corral Creek (page 6-95) is to "pump water from the top of Sites Reservoir for release into Stone Corral Creek. Based on the demonstration of the effect of partial settling of suspended sediment on total metal concentrations in Sites Reservoir and the conservative nature of this assessment, metal concentrations in Sites Reservoir are expected to meet water quality standards for the protection of aquatic life during the drier parts of the year in water located above the deepest portions of the reservoir." This conflicts with earlier statements in this DEIR (page 6-82) that states "based on the calculations that demonstrate the effect of partial settling of suspended sediments, settling of suspended sediment may have a substantial effect on total metal concentrations. With these assumptions for partial settling, concentrations for total aluminum may be close to the 620 µg/L water quality standard for aquatic life protection, hovering between about 500 µg/L and 750 µg/L (Figure 6-9). Total copper concentrations may occasionally exceed water quality standards for aquatic life protection." Even higher concentrations could be expected had the effects of dissolution of metals from the sediments been considered in the analysis.

The DEIR on page 6-100 states that "the net effect of the Project would be to enhance beneficial uses of water, and water quality could improve in parts of the study area. For example, during some months the increases in Delta outflow could reduce seawater intrusion and under certain circumstances Alternatives 1, 2, and 3 could allow for seasonal storage changes in Shasta Lake that could help to preserve cold-water supply for fish through exchanges with Sites Project water." Increased releases from Sites Reservoir to preserve water in Lake Shasta will result in a greater percentage of water in the Sacramento River being composed of Sites Reservoir water, which results in less dilution from Shasta releases, and greater metals concentrations in the Sacramento River.

This section goes on to say "the development of Sites Reservoir for Alternative 1, 2, or 3 would create in-reservoir habitat and thus net benefits for Reservoir cold-water and warm-water fish species." Cold water fish species would be impacted by the anoxic conditions expected to occur in the hypolimnetic environment required by such fish. In addition, high methylmercury concentrations in the reservoir will impact all fish species. Mitigation for mercury includes not stocking fish for at least 10 years, so there would be no net benefits to cold-water and warm-water fish species for at least 10 years.

This section also states that "operations would increase water supply reliability for refuges, municipalities, and agriculture, particularly in Dry and Critically Dry Water Years." Though reliability may increase, the quality of water provided by Sites Reservoir may not be suitable for wildlife habitat in refuges and may require additional treatment by municipalities, particularly in dry and critically dry years when less dilution water would be available from existing water projects.

The Sacramento River from Red Bluff to Knights Landing is on the Clean Water Act Section 303(d) Impaired Water Bodies list for PCBs, but there is no discussion in this DEIR about PCBs.

Chapter 5. Surface Water Resources

The DEIR on page 5-28 states that "in-lieu exchanges between Sites Reservoir releases and flow in the Sacramento River would occur when Sites Reservoir releases were used to meet local Storage Partner demands (Sacramento River Settlement Contractors, Reclamation, or, most likely, GCID) that normally would be met through diversions from the Sacramento River." There would be no dilution of water from Sites Reservoir with water from the Sacramento River under such exchanges, and therefore water with higher levels of metals would be supplied to local Storage Partners, particularly GCID, with associated adverse effects. There is no discussion about the adverse effects of such exchanges from metals or other water quality parameters (HABs, cyanotoxins, etc.) to the local water users, including use on wildlife refuges.

The SWRCB is engaged in activities to address the precipitous declines of native aquatic species and the ecosystem they depend upon. These activities include updating the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary to protect the Bay-Delta watershed and its many beneficial uses. The SWRCB is focusing on the Sacramento River and its tributaries, Delta tributaries, Delta outflows, and interior Delta flows. As with the Lower San Joaquin River and Southern Delta update, the SWRCB is concerned about adequate flows in the Sacramento River system to protect instream fish and wildlife, and is proposing Delta inflows of up to 65% of unimpaired flow in the Sacramento River. These updates to the Bay-Delta Plan will reduce the amount of water available for diversion to the proposed Sites Reservoir. There is no discussion about how the reduced flows available for diversion from the Sacramento River due to updates to the Bay-Delta Plan will affect the viability of the proposed Sites Reservoir project.

Chapter 10. Wildlife Resources

In discussing Impact WILD-1k: Golden Eagle and Bald Eagle, the DEIR states on page 10-96 that "the completed reservoir would provide new bald eagle foraging habitat (fish in the reservoir) and result in new nesting sites or wintering habitat because of the proximity to new foraging habitat. These would be beneficial effects." There would be no fish in the reservoir for at least 10 years (Mitigation Measure WQ-1.1), so there would be no new bald eagle foraging habitat and no new nesting sites or wintering habitat because of the proximity to new foraging habitat, therefore no beneficial effects. After 10 (or more) years, any fish stocked into the reservoir would develop a mercury burden which would impact fish eating birds, such as the bald eagle.

CEQA Significance Determination and Mitigation Measures finds that implementation of Alternative 1 or 3 would have the beneficial effects of providing new bald eagle foraging habitat (Sites Reservoir) and new nesting sites or wintering habitat because of the proximity to the new foraging habitat. As explained above, there is no new foraging habitat or nesting or wintering habitat because there will be no fish in the reservoir for at least 10 years. This is also true for the *NEPA Conclusion* on page 10-99. There is no discussion of any mitigation measures to prevent bald eagles, or other fish eating birds, from ingesting fish contaminated with mercury, or how their populations will be mitigated due to the adverse effects from ingestion of mercury laden fish.

In discussing impacts to various species of bats, the DEIR states that "the completed reservoir would provide a new drinking water source and foraging habitat (insects associated with the reservoir) for bats. This would be a beneficial effect of the Project." The DEIR does not address the impacts to bats from ingesting water laden with cyanotoxins from HABs in the reservoir, nor the effects of mercury in the insects that the bats would be eating.

DWR 2007. Mercury Contamination in Fish from Northern California Lakes and Reservoirs. July 2007