NORTH COAST RIVERS ALLIANCE

August 11, 2011

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Re: Opposition to the Proposal to Curtail Monitoring at the Grassland Bypass Project

Dear Grassland Bypass Project Data Collection & Review Team and Oversight Committee:

The undersigned groups oppose reductions in the monitoring program for the Grassland Bypass Project and, furthermore, recommend a comprehensive reassessment of the need for enhanced monitoring and scientific evaluation. We can see no technical justification or rationale for this reduction in monitoring for a project that has exceeded water-quality objectives and standards for more than fifteen years. We urge the Oversight Committee to reject this unjustified reduction in monitoring and require a reassessment of monitoring and study needs in view of the historical experience with the Grasslands Bypass Project and the long-ignored scientific recommendations of the United States Geologic Survey (USGS) and others to take a systematic, mass-balance approach to understanding the impacts of selenium and other contaminants from the Project. The discharge of selenium and other contaminants in excess of Federal and State water-quality standards threaten populations of Salmon, Steelhead, and Sacramento Splittail, as well as the waterfowl and wildlife resources of the State and Federal National Wildlife Refuges in the area. At the proposed concentrations, mortality of Chinook salmon, steelhead, Sacramento Splittail, waterfowl, and other wildlife are predicted in or adjacent to Mud Slough, the San Joaquin River, and the Delta Estuary. (See Figure 6)

We appreciate the opportunity to comment upon the United States Bureau of Reclamation (USBR) and San Luis Delta Mendota Water Authority (SLDMWA) draft monitoring proposal pending before the Data Technical Committee. The draft proposal would curtail the monitoring program for the discharge of selenium, salt, boron and other contaminants being drained into Mud Slough and the San Joaquin River, using the Federal San Luis Drain as the wastewater collection and discharge conduit. The monitoring proposal would reduce the frequency of monitoring for critical contaminants and supporting parameters at various sites, with no technical justification or analysis of increased bias and uncertainty in tracking water-quality compliance and Project effectiveness. These reductions will mask the pollution spikes in the watershed, river and estuary and provide insufficient data needed to model impacts to the

San Joaquin River and the Delta Estuary. These deficiencies have been previously outlined by the scientific community, but continue to be ignored.

In a declaration before the United States District Court for the Eastern District of California filed by Mr. Glaser, Mid-Pacific Region Director, USBR, on April 1, 2011[1], Mr. Glaser and USBR reported, "On February 16, 2010, the Regional Board staff announced that it would no longer conduct water quality monitoring at twelve sites for the GBP, because of funding and staffing shortage. In addition, staff for the California Department of Fish and Game expressed doubts that they could continue biological monitoring for the project due to staff losses. Reclamation is working with other agencies to revise the Project's monitoring program, and will assign staff and seek funding to assure that the water quality and biological monitoring requirements are met."[2]

Operating under State of California Waste Discharge Requirements (WDRs), USBR and SLDMWA (Dischargers) have transported selenium and other contaminants from the San Luis Drain to the San Joaquin River starting in 1995 as a "temporary" two year project that was next extended to 2000, and then again extended to 2009, and recently extended again to 2019.(See Figure 1) USBR data document that, from 1996 to 2008, the dischargers have dumped 85,954 lbs of selenium, 25,251,000 lbs of Boron and 9,772,610 tons of salt to Mud Slough, the San Joaquin River, and the Delta Estuary.[3]

Even before 1995, these Dischargers drained selenium and other contaminants from the San Luis Drain, via Mud Slough to the San Joaquin River actually began under two Clean Water Act National Pollutant Elimination System (NPDES) permits.[4] (See Figure 1) Under those permits the selenium pollution controls and monitoring frequencies were much stronger. The compliance monitoring took place at the point of discharge not some 30 miles downstream. And concentrations at the point of discharge were much lower for Mud Slough (north) along with concentrations measured in the San Joaquin River monitoring sites. First, in November of 1987, USBR was allowed to drain the Kesterson ponds via Mud Slough into the San Joaquin River. A second NPDES permit to discharge selenium contaminated groundwater was issued to the Dischargers, USBR and SLDMWA, in March of 1996, where toxic drainage and ground water discharged also had similar monitoring and water quality compliance requirements.[5]

Under the previous and present permits Dischargers use sumps and pumps to move groundwater collected from subsurface drainage systems, which collect contaminated groundwater from as deep as 100 feet drawing from contaminated water from basically horizontal groundwater wells some 50- 100 feet in depth[6] to collect pollution from over 97,000 acres and discharge toxic contaminants that exceed federal and state water quality standards, violate the Sacramento-San Joaquin Valley Basin plan, degrade beneficial uses, and create a nuisance and burden for downstream users to clean up, thus passing these environmental hazards and treatment costs to downstream users.

What is the rationale for curtailing monitoring?

Repeated requests to develop a comprehensive and effective monitoring program for the Grasslands Bypass Project have not been acted upon.[7] There has been a consistent failure to develop

monitoring to determine the fate and transport of selenium and other contaminants in the food chain where it's magnified effects result in a narrow window of exposure before mortality. Despite the lack of monitoring, selenium concentrations in avocet and stilt eggs at the Grasslands Drainers' reuse area have been found to exceed those found at Kesterson National Wildlife Refuge![8] Further the project has failed to track the selenium loading from the Grassland Drainage Area into the San Joaquin River, the Sacramento-San Joaquin Delta and the North Bay (e.g. Suisun Bay), as required in the 2001 Record of Decision for the GBP.[9] Biological monitoring and impacts especially to coldwater fish have not been monitored.[10] For example a Lemly index was not determined for San Joaquin River sites due to lack of sufficient sample of invertebrates and because bird eggs, one component of the index, are not sampled there. Selenium is being exported to southern California's water supplies through the California Aqueduct threatening drinking water quality and likely is accumulating in fish and reservoirs in Southern California as a result.[11]

Also the GBP has failed to monitor and consider the long term impacts of discharging selenium through wetland and slough areas adjacent to federal and state wildlife refuges, the San Joaquin River and Delta Estuary.[12] This history of inadequate monitoring and insufficient scientific assessment will be made far worse if the proposed reductions in monitoring are allowed. We find absolutely no evidence that the proposed reductions are based on documented scientific analysis.

Models Accurately Document an Ongoing Failure to Meet Water Quality Standards in the San Joaquin River and Mud Slough (North) and Continue to Impair the Bay-Delta.

Since 1994, models used to establish the amount of selenium loads to be discharged to the San Joaquin River and Delta Estuary have accurately documented that these loads of pollution do not meet Federal and State standards for minimal protection of water quality.[13] [See Figures 3-5] Moreover, since 2000 the load models used have even been modified to permit greater discharges of pollution without triggering a violation. These modifications include relaxing criteria for violation rates, choosing a monthly mean instead of a 4 day average, and changing the water years.[14] Environmental Defense Fund estimates the change from the four-day flow averaging period to a one month averaging period resulted in a 21 percent to 44 percent increase in allowable loads.[15] "If implemented as an interim compliance, this change in the averaging period would be expected to cause numerous violations of the water quality standards. Similarly, relaxing the once-in-three year excursion rate to a once-in five-month per year rate resulted in a significantly higher allowable load."[16] These predicted violations have proven accurate.[17] Using similar calculation assumptions, USBR figures for 2009-2019 predict violations also for the continued loads of pollution allowed.[18] The dischargers use these generous load targets and the ability to meet them as a sign of success. The fact remains, however, that they fail to meet safe concentrations in the Mud Slough (north) wetland channels through State and Federal Wildlife Refuges and concentrations remain extremely high in Mud Slough (north) and in the San Joaquin River above the compliance point measured some 30 miles away. Along with the violations of the federal and state water quality standards, concentrations of selenium in fish and wildlife also remain high. Scientists predict a high mortality for coldwater fish such as salmon and green sturgeon from these concentrations.[19]

The San Joaquin River downstream of the Merced River has been delisted as water quality impaired because of dilution water from the Merced River, weak standards and inadequate monitoring mentioned above. The selenium contamination, however, continues to drain into the Bay-Delta with predictable results. The Clean Water Act Section 303(d) list of water quality limited stream segments lists 41,736 acres in the Delta, 5,657 acres in the Carquinez Straights, 70,992 acres in San Francisco Bay Central, 9,024 acres in San Francisco Bay south and 68,349 acres in San Pablo Bay as impaired by selenium.[20] The west side discharges are a major source of those water quality impairments.[21] Health advisories are in effect for scaup, scoter and benthic feeding ducks in many of those areas.

A study by the U.S. Fish and Wildlife Service[22] for USEPA identified that several bird species protected under the Migratory Bird Treaty Act (MBTA) are considered "species most at risk" from selenium contamination in the San Francisco Bay. Greater scaup, lesser scaup, black scoter, white-winged scoter, surf scoter and bald eagle are listed as "species most at risk" from selenium contamination and all are covered by the Migratory Bird Treaty Act (MBTA). By allowing continued discharges of selenium in excess of Basin Plan objectives from the Grasslands Bypass Project, there is downstream contamination and selenium bioaccumulation in the Bay-Delta, and increasing likelihood of MBTA and ESA violations by the United States.

Government Scientists Have Criticized the Existing Monitoring Program and Proposed Reductions Further Erode Protection of Public Resources

EPA has urged the development of a comprehensive monitoring program if the project is extended.[23] USFWS comments have identified numerous monitoring deficiencies with regard the fate and transport of selenium and the long term effects on especially on coldwater fish, wildlife and endangered species.[24]

In 1996 USGS scientists provided the Oversight Committee with a comprehensive critique of the proposed monitoring plan, developed in cooperation with USBR. [25] Many of USGS comments still apply. They include recommendations for assessing the fate and transport of selenium in the project area; evaluation of selenium in sediment and its transport; evaluation of suspended particulate forms of selenium from the discharges; and for better biological and water quality monitoring. One of the main findings of the USGS review is that a monitoring program and study is needed to evaluate the mass balance of SE that includes the dissolved and suspended particulate forms of selenium. This continuing lack of comprehensive monitoring for the management of selenium contamination is also echoed in a recent scientific article, by Luoma & Presser 2009:[26]

"Uncertainties in protective criteria for Se derive from a failure to systematically link biogeochemistry to trophic transfer and toxicity (Figure 1). In nature, adverse effects from Se are determined by a sequence of processes (12). Dilution and redistribution in a water body determine the concentrations that result from mass inputs. Speciation affects transformation from dissolved forms to living organisms (e.g., algae, microbes) and nonliving particulate material at the base of the food webs. The concentration at the base of the food web determines how much of the contaminant is taken up by

animals at the lower trophic levels. Transfer through food webs determines exposure of higher trophic level animals such as fish and birds. The degree of internal exposure in these organisms determines whether toxicity is manifested in individuals. Se is first and foremost a reproductive toxicant (both a gonadotoxicantanda teratogen): the degree of reproductive damage determines whether populations are adversely affected. Adverse effects on reproduction usually occur at lower levels of exposure than acute mortality, but such effects can extirpate a population just as effectively as mortality in adults."

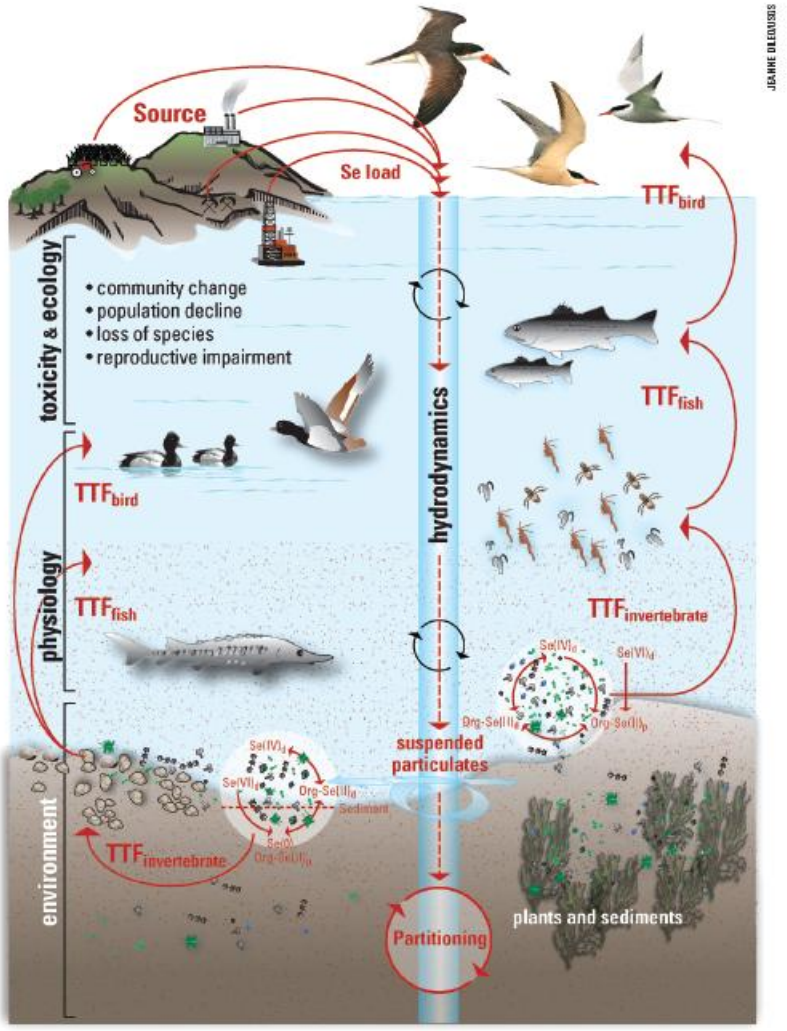

FIGURE 1. Conceptual model of Se fate and effects emphasizing the roles of speciation, biogeochemical transformation, and trophic transfer factors in modeling two aquatic food webs: a water column food web and a benthic food web. TTF = trophic transfer factor. Subscript d means dissolved, subscript p means particulate.

As of 2007 an estimated 222,025 cubic yards of sediment has accumulated in the San Luis Drain.[27] This is nearly a four-fold increase over the original 55,788 cubic yards of sediment that were recommended for removal at the beginning of the project, but never carried out.[28] Also contained in the USGS report on the Review of the Grassland Bypass Channel Project Monitoring Program is the

following assessment of the entire monitoring program: "The original Monitoring Plan is not adequate because it does not account for all appropriate sources and sinks of selenium, salt, and boron within the GBCP area and because the sampling design does not adequately address temporal, width, and depth variability in chemical concentrations and loads."[29] These contaminated sediments and suspended particulates in the water pose a toxic danger in the Drain, as well as, in Mud Slough and the San Joaquin River, that continue to grow and the proposed reductions in monitoring do not remedy these problems and shortcomings.

Conclusion: Continued Monitoring and a More Rigorous Approach are Necessary to Protect the Public Interest and Water Quality.

Rather than reduce monitoring, as proposed, we urge a substantial increase in the current 2001 monitoring plan to ensure compliance with state and federal law, while at the same time immediately initiating a comprehensive, peer-reviewed reevaluation of the monitoring program and the amounts of selenium being discharged under the current Total Maximum Daily Load (TMDL) and WDRs implementing the TMDLs. As noted in the November 3, 1995 agency letter, "There is no commitment, at this time, to approve long-term use of the Drain." [30] Further in 2001 the Regional Board staff reported, "If monitoring demonstrates that the water quality objectives are not being met then additional load reductions or amendments to the TMDL will be required."[31] As noted previously and documented in figures 3-5, discharges exceed federal and state water quality standards. The Waste Discharge Requirements and compliance monitoring need to be strengthened not relaxed.

Based on current science, the continued extension of discharges from the Grasslands Bypass Project make it more important than ever to ensure that a long-term monitoring and scientific assessment finally address the impacts of the Project and the realistic chances of future reductions in contamination. Please add us to any notifications regarding changes in the monitoring program or waste discharge requirements.

Sincerely,

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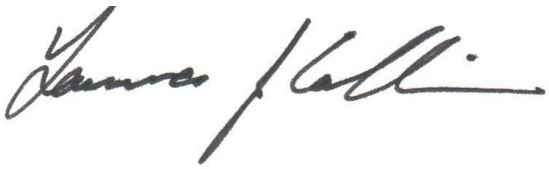

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Julie Vance and John Shelton, California Department of Fish and Game
Kim Forrest, Wildlife Refuge Manager
San Luis National Wildlife Refuge Complex U. S. Fish and Wildlife Service
Interested Parties

Permit History for Selenium Discharges From Grasslands Basin Watershed to Mud Slough and San Joaquin River:
A Case History in the Failure to Enforce Water Quality Standards

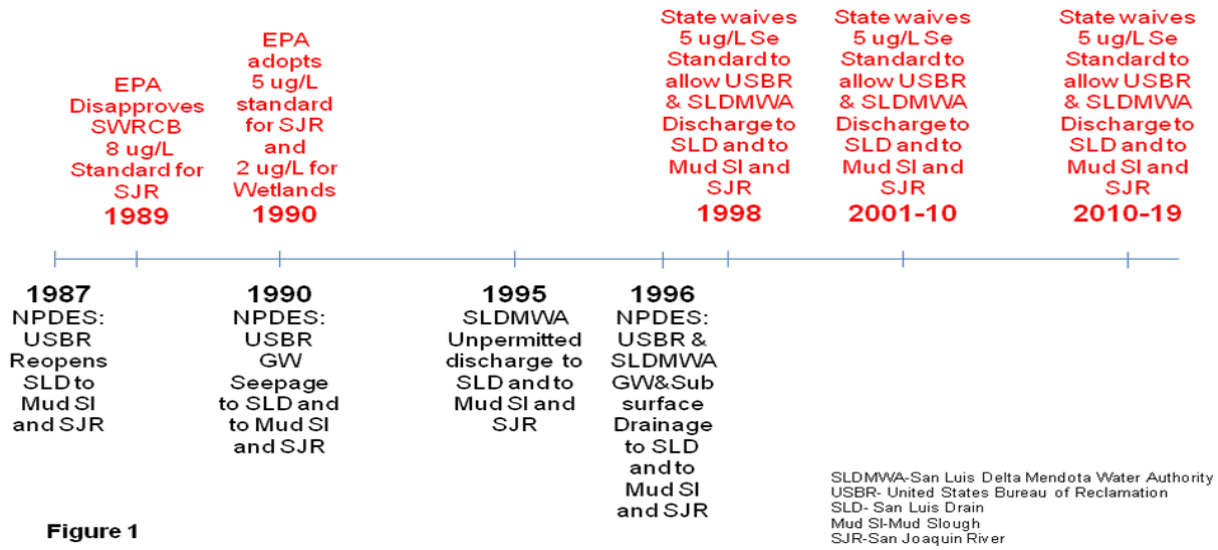


Figure 1

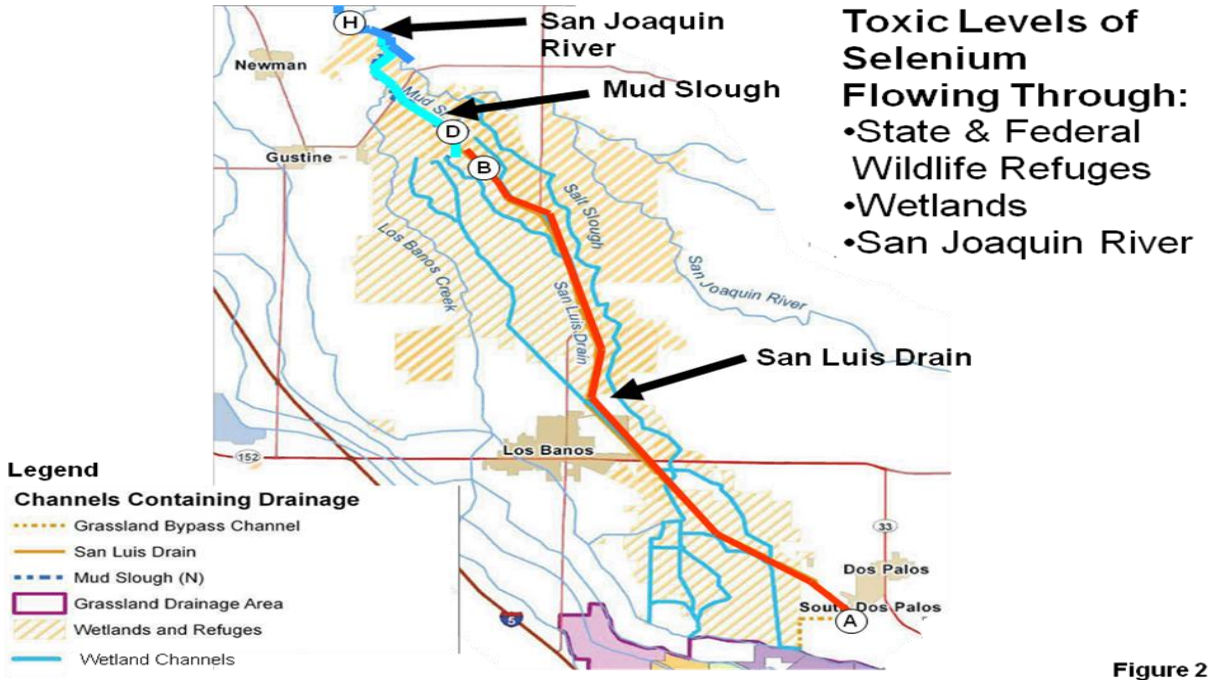


Figure 2

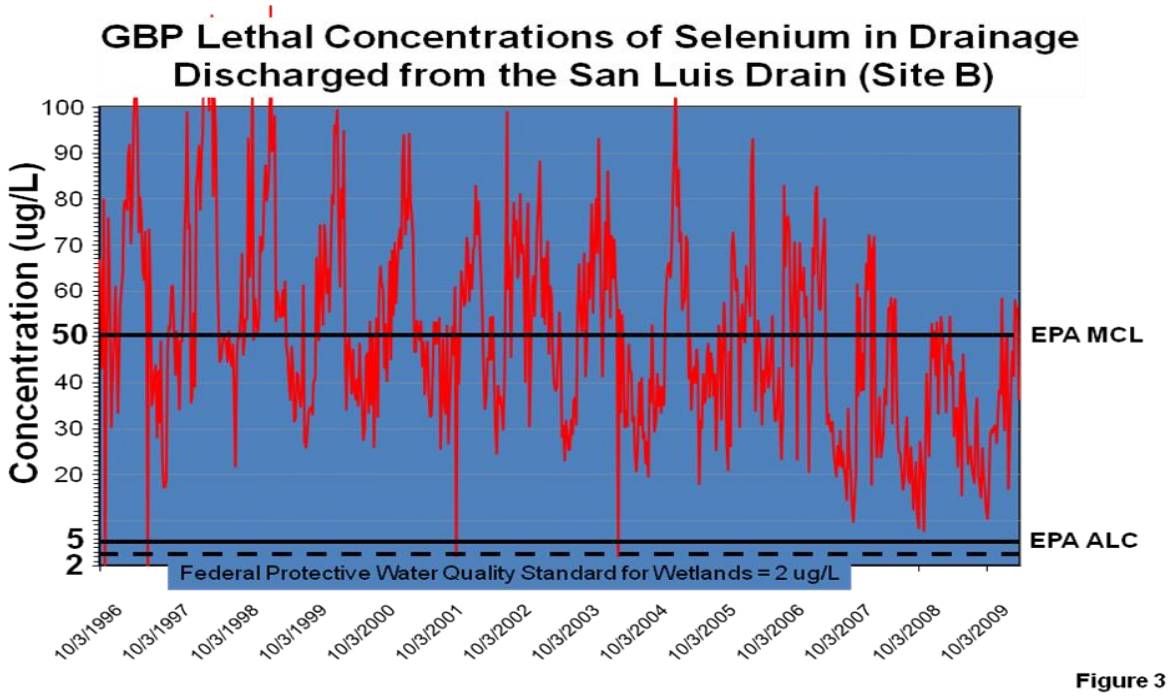


Figure 3

Data from USBR-Eacock MCL=Maximum Contaminant Level for Drinking Water ALC=Aquatic Life Criterion

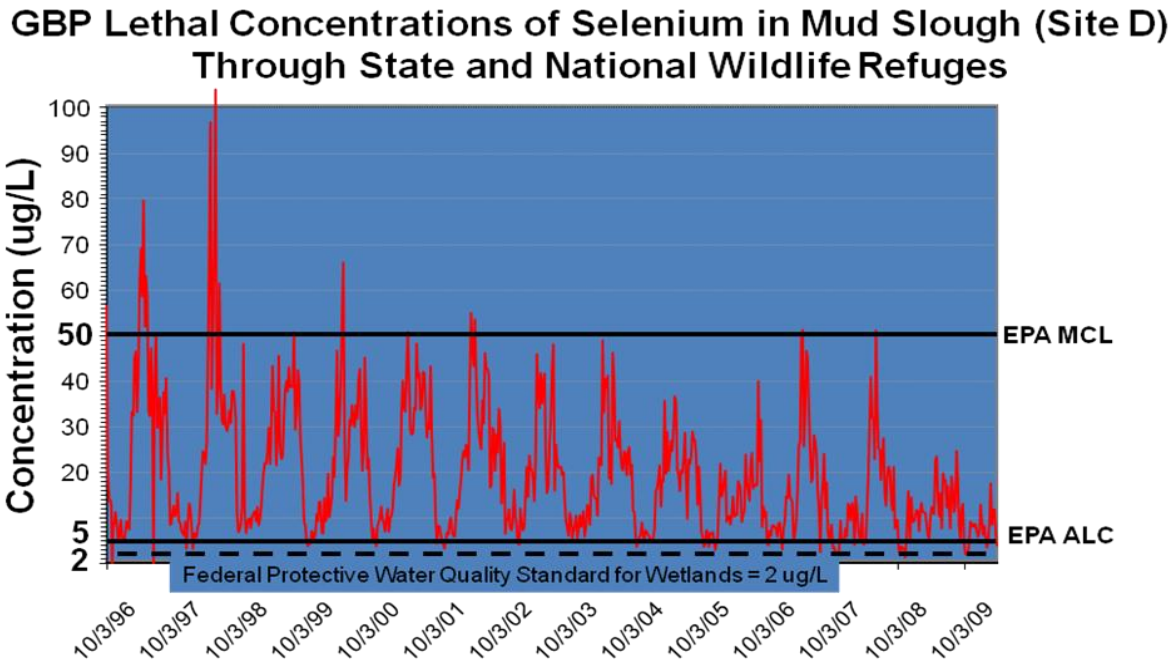


Figure 4

Data from USBR=Eacock MCL=Maximum Contaminant Level for Drinking Water ALC=Aquatic Life Criterion

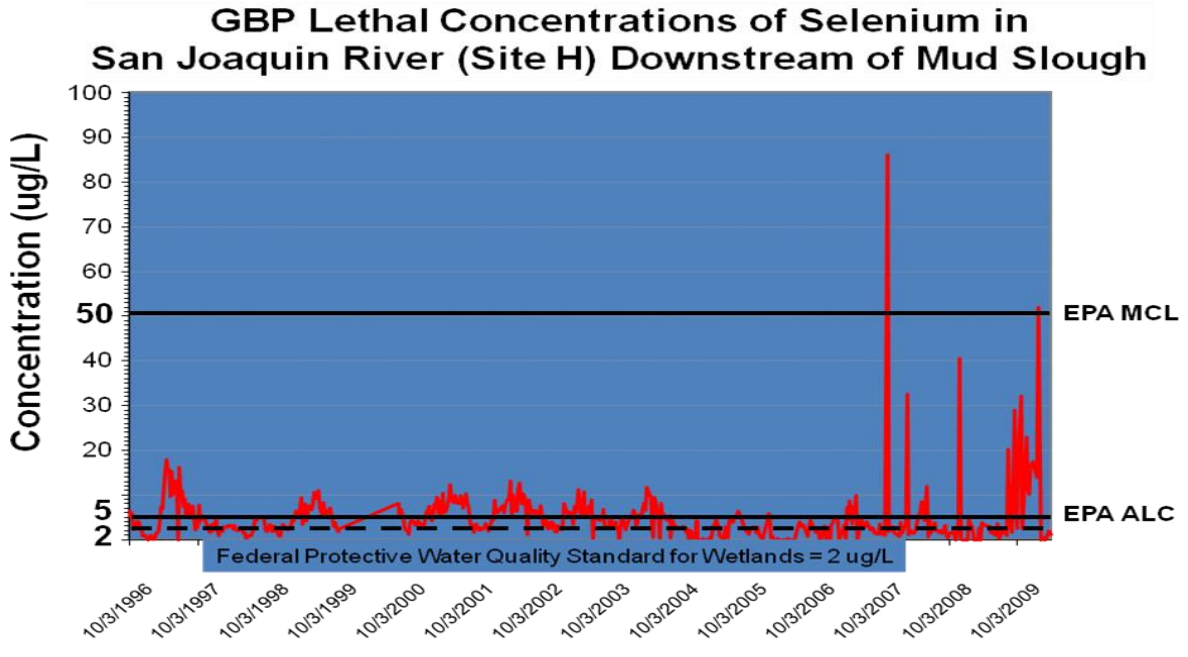
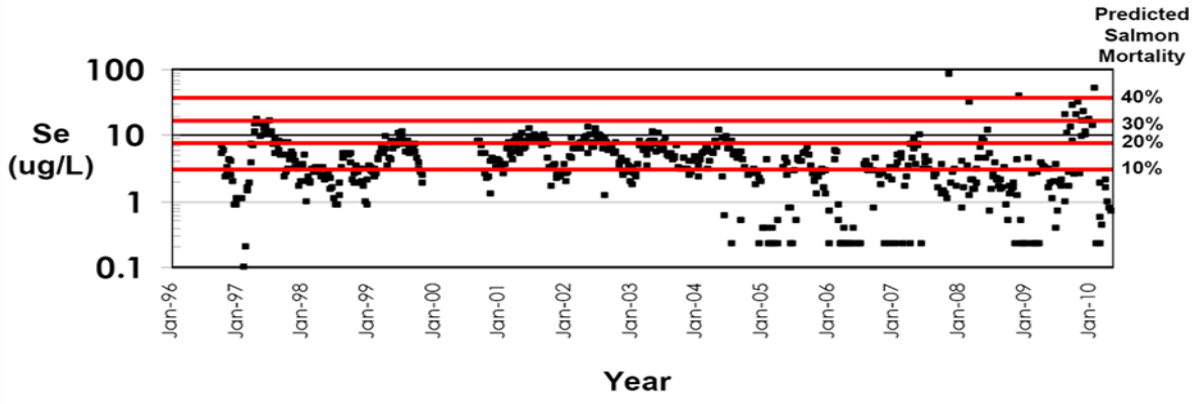


Figure 5

Data from USBR Eacock MCL=Maximum Contaminant Level for Drinking Water ALC=Aquatic Life Criterion

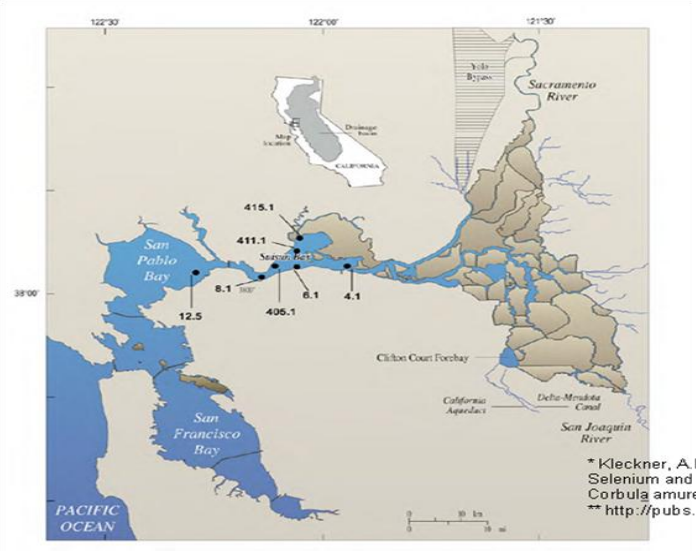
Selenium Levels in the San Joaquin River are not Safe for Salmon



Selenium concentrations measured in the San Joaquin River at Hills Ferry (data from USBR [Eacock]and USFWS [Maurer & Beckon])

Figure 6

Selenium Impacts in Bay-Delta



Unsafe levels of Selenium concentrations found in Suisun Bay and Northern San Francisco Bay 2 to 22 ppb.*

Selenium loads per day from Westside irrigators contribute approximately 10 to 30 times daily selenium load compared to the Sacramento and Oil refineries combined.**

* Kleckner, A.E., Stewart, A.R., Elrick, K., and Luoma, S.N., 2010, Selenium and stable isotopes of carbon and nitrogen in the benthic clam Corbula amurensis from Northern San Francisco Bay, California: May 1995b

** http://pubs.usgs.gov/pp/p1646/

Figure 7

ENDNOTES

[1] Federal Defendants' Status Report of April 1, 2011. Case 1:88-cv-00634-OWW-DLB Document 864 Filed 04/01/11 page 6 & Glaser Third Declaration pg 6-7

[2] Ibid.

[3] http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=4418 pg 26 of 66 FEIR/EIS Final EIS/EIR, Private/individual comments Part 2, Grassland Bypass 2010-2019

[4] Order No. 87-201 NPDES No. CA 0082171 Waste Discharge Requirements for United States Department of the Interior Bureau of Reclamation & Order No 90-027 NPDES NO CA 0082368 WDRs for USBR.

[5] Order No 96-0922 NPDES No. CA 0083917 Waste Discharge Requirements for USBR and San Luis Delta Mendota Water Authority adopted March 22, 1996.

[6] http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=4413 "Tile drainage systems affect groundwater-flow in upper parts of the semi-confined aquifer. Seasonal changes in groundwater levels and drain flow indicate field conditions are affected by upslope irrigation activities. Furthermore, observation well data show that groundwater movement is upward towards the drainage systems from depths as great as 100 feet below land surface (Deverel and Fio, 1991; Fio, 1994)." Pg 236 of the PDF

[7] http://www.epa.gov/region9/nepa/letters/Grassland-Bypass-FEIS.pdf EPA March 30, 2009 Detailed EIS/EIR Comments RE Grassland Bypass Project Continued Use of San Luis Drain: *"Develop a comprehensive monitoring program that includes multiple contaminants and follow-up for detected biological effects…this program should cover biological as well as water quality and sediment components."*

http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=4415 pg 15 -52 of PDF USFWS March 22, 2009 Comments RE Continuation of GBP 2009 to 2019 USFWS recommends… "*An evaluation of the environmental effects of continued acute spikes of selenium to the biota in the vicinity of the Grasslands wetland supply channels…Selenium bioaccumulates rapidly in aquatic organisms and a single pulse of selenium (>10 µg/L) into aquatic ecosystems could have lasting ramifications….Maier et al. found that the invetebrate food web was still contaminated at >4 µg/L 12 months after selenium treatment when the monitoring ended even though water concentrations were <1 µg/L."*

http://pubs.usgs.gov/pp/p1646/pdf/pp1646.pdf pg 26. ... "monitoring was not sufficiently frequent to accurately characterize loads during variable flows."…annual data are not available from individual farm-field sumps to help qualify source-area shallow groundwater conditions and determine long-term variability in selenium concentrations…compliance monitoring sites are 50 and 130 miles downstream from the agricultural discharge. Pg 118-119.

Grassland Bypass Project 1999-2000 Annual Report at page 4, "The Oversight Committee recommended that additional studies be undertaken to establish the sources of selenium." http://openlibrary.org/books/OL23302134M/Grassland_bypass_project

Grassland Bypass Project 2001-2002 Annual Report at page 4, "The Oversight Committee recommended that additional studies be undertaken to establish the sources of selenium." http://openlibrary.org/books/OL23302136M/Grassland_bypass_project

" A Review of the Grassland Bypass Channel Project Monitoring Program" Presser, Sylvester, Dubrovsky and Hoffman, December 1996 http://wwwrcamnl.wr.usgs.gov/Selenium/Library_articles/Presser_etal_GBP_monitoring_plan_1996.pdf http://www.swrcb.ca.gov/rwqcb5/water_issues/grassland_bypass/usfws_att_e.pdf Email From Tomas Mauer, Chief, Investigations and Prevention Branch Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife Service to Shauna McDonald [USBR], 11-18-09: "*Site H is not as problematic a sampling site as it is described for monitoring selenium levels in this stretch of the San Joaquin River. Although the site is inappropriate to use for selenium load calculations, the historic data clearly shows that selenium concentrations here can reach high levels throughout much of the year regardless of Merced River influences. The highest selenium levels occur in the summer when Merced River flows through the side channel would not be influencing site H. Currently, sampling at site H is less frequent, and thus potential spikes of selenium may not be observed. A more detailed analysis of the data at this site may assess how well the current sampling regime would detect the highest selenium levels. Even the current reduced sampling effort shows concentrations over 9 µg/L. This is above the 20 percent mortality level and three times higher than the 10 percent mortality level for salmonids (attached chart includes more recent data for 2007)."*

[8] USFWS 2009 Biological Opinion for the Grasslands Bypass Project page 90. http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=4826 "It is notable that the geometric mean, egg-selenium concentration in recurvirostrid eggs collected at the SJRIP Phase I area in 2008 (50.9 µg/g) exceeded all geometric mean selenium concentrations in recurvirostrid eggs collected at Kesterson Reservoir from 1983 to 1985 (Ohlendorf and Hothem 1994)…"

[9] USBR 2001 Record of Decision page 6. http://www.usbr.gov/mp/grassland/documents/rod_final_09-28-01.pdf

[10] http://www.swrcb.ca.gov/rwqcb5/water_issues/grassland_bypass/usfws_com.pdf "*Selenium concentrations in the food-chain of these impacted waters have often reached levels that could impact or even kill a substantial proportion of young salmon (Beckon et al. 2008) if the salmon, on their downstream migration, are exposed to those selenium-laden food items for long enough for the salmon themselves to bioaccumulate selenium to toxic levels. Based on existing water quality data for selenium in specific reaches of the San Joaquin River, Beckon and Maurer (2008) concluded that there remains a substantial ongoing risk to migrating juvenile Chinook salmon and steelhead in the San Joaquin River as noted in Attachment E. The Service asks that the Regional Board consider the protection of Chinook salmon and steelhead in the San Joaquin River, including the reach between Sack Dam and the Merced River, in this Basin Plan Amendment."[page 6 of pdf]*

[11] http://calitics.com/tag/Selenium Napolitano, Garamendi, et al., November 26, 2010. Personal Communication Rudy Schnagl to Ms Schifferle, 8-8-11 'Flow models document most of the San Joaquin River is diverted to the California Aqueduct, thus contaminants are likely captured and sent south.'

[12] Suisun Bay in the Delta is selenium impaired and agriculture is listed as a source in the 303(d) listing of this water body. Further, EPA is in the process of developing a site specific selenium objective for the Delta, so reduced monitoring of the GBP could further hinder compliance with this future objective.

[13] http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/san_joaquin_se/se_tmdl_rpt.pdf "*There would be effectively no allocation of selenium load in the absence of Merced River dilution flows. The source analysis has shown that subsurface agricultural return flows from the DPA are the primary source of selenium load in the lower SJR Basin." [page 14]* Also see 1994 Regional Board staff report, Total Maximum Monthly Load Model for the San Joaquin River (Karkoski, 1994),

[14] November 3, 1995, Letter to Karl Longley Central Valley Regional Water Quality Control Board from Dan Nelson, SLDMWA, Roger Patterson, USBR; Felicia Marcus, USEPA; Joel Medlin USFWS. *"A commitment to specific monthly and annual selenium load values which assure that within 2 years, the Water Authority will implement actions sufficient o reduce selenium loads to the River by at least 5 percent per year up through the end of the 5th year. …the parties agree that for the purpose of establishing selenium load reductions, the following water quality objectives are now applicable: (a) 5 ppb selenium, measured as a 4-day average, in the San Joaquin River and Mud Slough and (b) 2 ppb selenium, measured as a monthly mean, in Salt Slough and the wetland channels.*

[15] 1994 Environmental Defense Fund, Terry Young and Chelsea Congdon "Plowing New Ground" pg 35.

[16] Ibid.

[17] http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/san_joaquin_se/se_tmdl_rpt.pdf pg 20 of the PDF

"Load allocations in this TMDL [for the SJR] are established for meeting the selenium water quality objective in the SJR downstream of the Merced River confluence. There would be effectively no allocation of selenium load in the absence of Merced River dilution flows. The source analysis has shown that subsurface agricultural return flows from the DPA are the primary source of selenium load in the lower SJR Basin….. Attainment of the selenium water quality objective upstream of the Merced River confluence may require significant changes to the DPA discharge, including the relocation of the discharge point."
http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/sjr_selenium/comments092210/susan_moore.pdf pg 2 of the PDF

[18] http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=4418 pg 26 of 66 FEIR/EIS Final EIS/EIR, Private/individual comments Part 2, Grassland Bypass 2010-2019
http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=3513
Also see Appendix C of the December 17, 2009 Agreement for the Continued Use of the San Luis Drain Agreement No. 10-WC-20-3975. Predicted violations of CWA standards will continue with proposed loads approximately until years 9 and 10. They will be violated for those years unless "highly speculative treatment" is achieved. See http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=4415 pg 4 of 40 of the PDF. EPA comments on the DEIS/EIR for Continued Use of the San Luis Drain for Discharge into Mud Slough and the San Joaquin River.

[19] http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=3513

[20]http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/state_usepa_combined.pdf
[21]http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/sjr_selenium/comments092210/susan_moore.pdf see page 2 of the PDF
[22]http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/TMDLs/northsfbayselenium/Species_at_risk_FINAL.pdf, accessed 4/20/11.
[23] http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=4415 see EPA comments pg 5 of 40 of the PDF.
[24] http://www.waterboards.ca.gov/centralvalley/water_issues/grassland_bypass/ http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/sjr_selenium/comments092210/susan_moore.pdf
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[27] http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=4415 see USFWS comment pg 33 of 40 of the PDF.
[28]http://wwwrcamnl.wr.usgs.gov/Selenium/Library_articles/Presser_etal_GBP_monitoring_plan_1996.pd @ pg 81 of the pdf.
[29]http://wwwrcamnl.wr.usgs.gov/Selenium/Library_articles/Presser_etal_GBP_monitoring_plan_1996.pdf @ pg 15 of the pdf
[30] November 3, 1995 Letter From USBOR, USFWS, US EPA and San Luis Delta Mendota Water Authority to Karl Longley, Chair of the Regional Water Quality Control Board: Re Basin Plan Amendment for the San Joaquin River. *"The Selenium load reductions proposed will not necessarily achieve these water quality objectives by the end of the 5th year, and thus a long-term implementation schedule will be required……It is understood that load reductions of this sort are only a first step and do not fully protect against the environmental impacts which may result from selenium discharges during months when water levels are low in the San Joaquin River*" at pages 3-4.
[31]http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/san_joaquin_se/se_tmdl_rpt.pdf *"Load allocations in this TMDL are established for meeting the selenium water quality objective in the San Joaquin River (SJR) downstream of the Merced River confluence. There would be effectively no allocation of selenium load in the absence of Merced River dilution flows. The source analysis has shown that subsurface agricultural return flows from the Drainage Project Area (DPA) are the primary source of selenium load in the lower SJR Basin….. Attainment of the selenium water quality objective upstream of the Merced River confluence may require significant changes to the DPA discharge, including the relocation of the discharge point."*