COMMENT LETTER

California Department of Transportation (CALTRANS)

From: Amy Barnes [mailto:amy_barnes@dot.ca.gov]
Sent: Monday, January 12, 2009 10:17 AM
To: Joe McGahan
Subject: Grassland Bypass Project, SCH 2007121110

Joseph,

Caltrans has no comments regarding the Grassland Bypass Project EIS/EIR, SCH 2007121110.

Thank you,

Amy Barnes
Transportation Planner
559.488.4199

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RESPONSE CALTRANS

California Department of Transportation
Amy Barnes, Transportation Planner January 12, 2009

No response is required.

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COMMENT LETTER

California Department of Water Resources (DWR)

State of California Department of Water Resources
Date: March 23, 2009

To: Ms. Judi Tapia

Bureau of Reclamation

South-Central California Area Office

From: Jose I. Faria
Department of Water Resources
Subject: Draft EIS/EIR Report for the Continuation of the Grasslands ByPass Project, 2010-2019

Thank you for the opportunity to review the Grassland Bypass Project (GBP), 2010-2019 Draft Environmental Impact Statement and Environmental Impact Report (EIS/EIR). Our understanding is that the Proposed Action would retain all of the features of the 2001 GBP features and will also include the following new features:

- Negotiation with Reclamation (and other stakeholders) for a proposed 2010 Use Agreement for the Drain, to include an updated compliance monitoring plan, revised selenium and salinity load limits, an enhanced incentive performance fee, a new WDR from the Regional Board, and mitigation for continued discharge to Mud Slough.
- In-Valley treatment/drainage reuse at the San Joaquin River Water Quality Improvement Project (SJRIP) facility.
- Other drainage management actions to meet water quality objectives/load limits.
- Utilizing and installing drainage recycling systems to mix subsurface drainwater with irrigation supplies under strict limits.
- Continuing current land retirement policies listed in the 1998 *Long-Term Drainage Management Plan for the GDA* (GAF and Authority 1998) and subsequent Westside Plan. Key among these is that land retirement should be voluntary.
- Implementing a compliance monitoring program with biological, water quality, and sediment components. Results of the monitoring program would be reviewed by an oversight committee as necessary and may be expanded in the proposed 2010 Use Agreement.
- Continuing the operation of a regional drainage management entity to perform management, monitoring, and funding of necessary control functions.
- A single WDR for the GDA.
- An active land management program to utilize subsurface drainage on salt-tolerant crops.
- Low-interest loans for irrigation system improvements, such as gated pipe, sprinkler, and drip irrigation systems.
- An economic incentive program including tiered water pricing and tradable loads.
- A no-tailwater policy that would prevent silt from being discharged into the Drain and promote the secondary benefits of irrigation water management.
- Implementing drainwater displacement projects such as using subsurface drainage for dust control on roadways.

- Meeting with landowners as necessary to implement projects and policies cited above.

Historically, the Department of Water Resources has technically and financially supported Grassland Area farmers in pursuing resolution of drainage management issues. Most recently, DWR facilitated the award of a 25 million dollar Proposition 50 grant to the San Luis and Delta-Mendota Water Authority to implement components of the Westside Regional Drainage Plan.

The Department of Water Resources recognizes that implementation of the 2001 GBP has been conducted in close cooperation with a variety of State and federal regulatory authorities including; the State of California Central Valley Regional Water Quality Control Board, the California Department of Fish and Game, the United States Fish and Wildlife Service and the United States National Marine Fisheries Service. We support the 2010-2019 GBP and its coordinated regulatory oversight. Following are our specific comments.

Page ES-8 (Table ES-1): Concerning "Salinity in SJR Downstream of Merced River" it seems like the "Proposed Action Compared to No Action" and "Alternative Action Compared to No Action" effects would actually be negative impacts since salinity increases at Vernalis and additional dilution flows would be necessary to meet WQOs. DWR-1

Page 2-10: Are the "proposed" selenium and salt load reductions mentioned in section 2.2.1.2.1 the values that will actually be adopted if the Proposed Action is implemented, or are these loads still under consideration, but may change?

Page 2-14: In the first and second bullets, water supply developed from local wells would first have to be evaluated for water quality and sustainability; parameters which may be questionable in this area.

Page 2-18: Please identify the treatment system mentioned in the third paragraph? Is it a pilot system?

Page 2-21: At the top of the page, mention is made of the fact that agricultural drainage would not enter the specified waterways except during high storm events. Are there any provisions or additional mitigations necessary in the event such discharges occur? DWR-2

The fourth paragraph states, "the Regional Board and State Water Resources Control Board (State Board) will need to approve a Basin Plan Amendment to defer the compliance deadlines for the water quality objectives in Mud Slough and the San Joaquin River between Mud Slough and the confluence with the Merced River," and further states the amendment must be finalized by October 1, 2010. Do the Boards plan to pursue such an amendment?

In the fifth paragraph, is any of the Phase l land slated for acquisition and planting of salt-tolerant crops considered habitat or wildlife foraging areas?

Page 4-55: We recommend that the GDA farmers investigate the feasibility of desalting their sump drainwater (the water that is applied to the SJRIP reuse area) upfront. Because the cost of RO desalination is directly proportional to the amount of salt present in the water, our experience indicates that the product water from a low recovery (40 to 50 percent) RO system could be desalted at a much DWR-3

lower cost than the desalting the drainwater coming directly from the SJRIP. In addition, the concentrate produced by the RO system could be used to grow salt tolerant crops and halophytes in the SJRIP area. This could provide for a self-sustaining system, since the RO concentrate output volume could be matched to the SJRIP salt tolerant crops irrigation needs resulting in zero or very low drainwater output. With an upfront drainwater recovery rate of 40 to 50 percent, there would be a net reduction in the amount of land needed to grow salt tolerant crops and the volume of recovered water could be added to the GDA's water supply portfolio. DWR-3

Page 5-9: The second paragraph states, "water quality impacts of permanently and reverse flooded wetlands have not been evaluated." Will this evaluation be done at a later time?

Page 5-13: The last two paragraphs seem to be contradictory. One says "Rain, salt dilution by applied water, and salt removal by drainage systems offset the salinity increases due to evapoconcentration. Therefore, soil salinity will approach a constant value; and the final salinity represents a new chemical equilibrium under simulated steady-state soil moisture conditions," while the other states, "For the 2010–2019 project period, the analysis indicates that soil salinity would increase as a result of current drainwater recycling". Our understanding is that rain and irrigation water are used to leach salts from the plant root zones, therefore maintaining an equilibrium in soils with subsurface drainage systems. Salts not picked up by the tile drains migrate downward in the soil profile and accumulate below the tile drains. DWR-4

Page 5-16: In the third paragraph, and elsewhere in the document, the statement is made, "the SJRIP reuse facility's operational objective is not agricultural production but water consumption." How will these salt-tolerant crops ultimately be used? Are there any potential issues related to use or disposal of these crops?

Page 5-19: The fifth bullet in section 5.2.5.2 reads "Simulated unsaturated-zone soil salinity almost doubles relative to existing conditions, but is considered a less-than-significant adverse impact because the soil remains productive." Similar statements are made elsewhere in the document but after such an increase in salinity, it isn't clear how productive the soil will be. Likewise, the sixth bullet mentions a significant increase in boron concentrations but maintains that agricultural productivity would continue. Would the land be as productive even with a significant boron increase?

Page 6-2: The Area 2 description mentions the "source zone." To what does this refer?

Page 6-13: While the biological resources discussion identifies various insectivorous species such as bats and birds, it doesn't indicate what the likelihood is of these species consuming insects containing elevated selenium levels and what the corresponding risks might be.

Page 6-20: The fourth paragraph identifies the fact that agricultural runoff entering the San Joaquin River may ultimately impact populations of Central Valley fall-run Chinook salmon. Is NMFS developing a Biological Opinion to address this issue? DWR-5

Page 6-23: Do the fairy shrimp species identified in the project area contain elevated selenium levels?

Page 6-43: The first paragraph states "drainage reuse has the potential to result in highly seleniferous subsurface drainwater ponding in fields at the reuse facility, which can create a hazard to birds.

However, careful management of irrigation water and tailwater (also described in Section 6.2.2.1.4) may be sufficient to avoid or minimize the potential for ponding." The wording of second sentence identifies the fact that even with careful water management, ponding, and selenium exposure to wildlife may still occur. Implementation of an effective monitoring program and means of eliminating standing water, should it occur, would help reduce the risk. DWR-5

Pages 7-6 (second paragraph) and 7-9 (first paragraph): Both of these paragraphs address fishing opportunities at Mud Slough and the fact that although fishing isn't sanctioned at this location, it still occurs. Information on page 7-9 indicates that fish and wildlife resources at Mud Slough potentially contain elevated and harmful levels of selenium. In addition to posting "no fishing" signs, are other means being employed to curtail the possible human health risk? DWR-6

Page 8-16: Concerning the fourth paragraph, giving the extremely high hardness and high bio-fouling potential of the drainwater from the SJRIP area; it seems very unlikely that the cost of desalting these waters with conventional reverse osmosis technology would be $1,500 per acre-foot (including concentrate disposal). Our comment for page 4-55 describes a possible way for reducing these costs. There is a need for developing newer technologies to improve and lower the costs of desalination of subsurface drainwater and disposal of concentrated salts. DWR is working with University of California at Los Angeles to develop these technologies and to bring them to the field to determine its feasibility. DWR-7

RESPONSE DWR

California Department of Water Resources
Jose I. Faria March 23, 2009

DWR-1
The comment on the summary table is over whether the impact should be negative not neutral. The answer is contained in Section 4.2.2.4.6 because the No Action baseline assumption is that there is no discharge. However, even though water quality is poorer with the Proposed Action compared to the zero discharge baseline, predicted TDS concentrations were still below the water quality objective. And the objective is the criterion for determining whether the effect is negative, neutral, or positive for the NEPA determination.

DWR-2
Concerning page 2-14, the selenium loads shown in this section are the ones to be adopted and that are included in the proposed Use Agreement. See Appendix A.

Concerning page 2-10, the exact source of well water has not been determined; and it will be checked for quality.

For the comment on page 2-18, the discussion is of a general nature and would be the full scale system. The specific system has not been selected. See discussion in the public hearing transcript on a possible pilot treatment plant.

For the comment on page 2-21, there is a storm water plan in place for these discharges (see pages ES-6, 1-3 and page 2-9).

Concerning page 2-21, fourth paragraph: The Regional Board is pursuing the Basin Plan Amendment and held a public hearing on November 12, 2008.

Concerning page 2-21, fifth paragraph: To date, 6,200 acres have been purchased. A 151-acre parcel comprising alkali scrub, alkali meadow, and freshwater marsh habitats will not be utilized for the In-Valley Treatment Drainage Reuse Project (see discussion on page 2-2 of EIS/EIR).

DWR-3
Comment noted and considered. The final treatment process has not been selected, but it will be implemented at a sufficient scale to handle the remaining drainage not handled by all other measures. See discussion on pages 2-14 and 2-18 and response to comment USEPA-1.

DWR-4
Concerning the comment on page 5-9, evaluation of the wetlands is not planned as part of this Project and is something the agencies responsible for management of the wetlands may do for expansion of their facilities or for future water acquisitions not covered under other CEQA and NEPA analyses.

On page 5-13, the comment asks if the paragraphs are contradictory. The first paragraph describes the general process, and the second describes a future steady state condition. They are not contradictory. Section 5.2.3.2.2 goes on to describe the steady state condition that will be reached.

Concerning page 5-16, the salt-tolerant crops will be analyzed and sold to appropriate markets. The statement is meant to say that crop production is a secondary objective of the reuse areas with drainwater consumption as the primary objective.

The commenter questions soil productivity statements on page 5-19. As the analysis states, the soils will still remain productive even with the projected increases in salinity and boron.

DWR-5

Response to the comment associated with Page 6-2: The "source zone" is described in Area 1 and refers to the drainage area, or the 97,400-acre source zone known as the Grassland Drainage Area.

The description of Area 2 will be clarified as follows:

- **Area 2 (Area 2):** 93 miles of wetlands channels, Salt Slough, and the San Joaquin River from the confluence of Salt Slough downstream to Mud Slough. This area is located within the GWD and state/federal wildlife management areas, and under current conditions does not receive water directly from the source zone (Area 1).

Comment associated with Page 6-13 is noted and considered as follows:

Due to scarcity of data on bats and certain special status birds that may potentially be affected, it is conservatively assumed that they may be affected by selenium bioaccumulation in the reuse areas under all alternatives (as compared to existing conditions). The sections for all alternatives contain language similar to that for the Proposed Project in Section 6.2.2.2.1:

"Special-status species that forage in reuse areas may experience significant adverse impacts compared to existing conditions, due to increases in Se soil concentrations and potential for increased ponding, resulting in increased Se bioaccumulation as described in Section 6.2.2.2.4. These species include the San Joaquin kit fox, bald eagle, Swainson's hawk, burrowing owl, northern harrier, tricolored blackbird, loggerhead shrike, mountain plover, giant garter snake, and pallid and western red bats. However, these species may be positively affected compared to the No Action Alternative because increases in Se bioaccumulation would be lower."

Concerning the comment on page 6-20, fourth paragraph regarding salmon and NMFS developing a Biological Opinion: fall-run Chinook salmon are not a listed species. The spring-run Chinook salmon introduced to the San Joaquin River as part of the San Joaquin River Restoration will be considered an "experimental population" under the terms of the Settlement Agreement and would not be considered a listed run. Thus a biological opinion would not be required for either of these races. Steelhead are listed and could potentially be impacted by the Project. A biological opinion from NMFS will likely be required for the Project for this species.

Comment associated with Page 6-23 is noted and considered. There is insufficient data to determine whether selenium concentrations in fairy shrimp in the Project Area contain elevated levels of selenium. However, the vernal pools in which fairy shrimp reside are not expected to be affected by the Project, as there is no hydraulic connection between the vernal pools and the GBP discharges or the wetland channels. This has been clarified as follows:

> Section 6.1.2.1.2
>
> Vernal pools are a special form of wetland found within grassland habitats throughout California and occur within the Grassland Wetlands area. Vernal pools are shallow depressions filled with water from winter storms that subsequently dry during spring or early summer. There is no hydraulic connection between the vernal pools and the GBP discharges or the wetland channels. The length of time that the water persists, salinity, and alkalinity generally determine herbaceous plant species composition, which is characterized by annuals (Holland and Keil 1987).
>
> Section 6.1.4.6.1
>
> All vernal pool and seasonal wetlands in Project Areas 2 and 3 are considered to be suitable habitat for the vernal pool branchiopods, and the species are assumed to be present. However, there is no hydraulic connection between the vernal pools and the GBP discharges or the wetland channels.
>
> Sections 6.2.2.1.1, 6.2.2.2.1, and 6.2.2.3.1
>
> The following sentence has been added at the end of each of the subsections for Areas 2 and 3 for all alternatives:
>
> There is no hydraulic connection between the vernal pools and the GBP discharges or the wetland channels, so the vernal pools and the species inhabiting them would not be affected.

Comment associated with page 6-43 is noted and considered. Section 6.2.2.1.4 describes the measures being taken to minimize selenium exposure to wildlife in the reuse areas, and summarizes the recent data indicating that while selenium concentrations in bird eggs appear to be declining, risks have not been eliminated. The planned mitigation and monitoring is described in Section 15.

DWR-6

Concerning pages 7-6 and 7-9, fishing opportunities in Mud Slough, there are no other means being employed to discourage fishing in Mud Slough beyond posting signs. CDFG analysis of carp caught in the slough at Highway 140 indicates concentrations of selenium below the proposed 2.5 mg/kg (wet weight) advisory tissue level proposed by the California Office of Environmental Health Hazard Assessment. (OEHHA, June 2008. Development of Fish Advisory Goals and Advisory Tissue levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene. Sacramento.)

DWR-7

Concerning the high cost of drainwater treatment, the GBD are interested in any technologies that could resolve the problem water at a lower cost and will consult with DWR further on work with UCLA. Thank you for bringing this to our attention. The final treatment process has not been selected. (See discussion on pages 2-14 and 2-18.)

COMMENT LETTER

California Regional Water Quality Control Board (CVRWQCB)

California Regional Water Quality Control Board
Central Valley Region
Karl E. Longley, ScD, P.E., Chair

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23 March 2009

Joseph C. McGahan, Drainage Coordinator
San Luis & Delta-Mendota Water Authority
PO Box 2157
Los Banos, CA 93635

DRAFT ENVIRONMENTAL DOCUMENT (EIR/EIS) FOR THE GRASSLAND BYPASS PROJECT, 2010- 2019

Thank you for the opportunity to comment on the December 2008 draft Environmental Impact Statement and Environmental Impact Report for the Use Agreement (UA) between the Bureau of Reclamation and the San Luis Delta-Mendota Water Authority for use of the San Luis Drain from 2010 through 2019. The Board will rely on the final document for the environmental analysis required under the California Environmental Quality Act (CEQA) and under the Board's Basin Planning CEQA substitute process. It is therefore critically important that alternatives to the proposed action are given a full and fair assessment.

In several places (pp ES-8, 4-7, 4-56, 4-70, 4-71, 4-74 and 17-9) the document indicates that there is no boron objective for Mud Slough and the San Joaquin River between Sack Dam and the mouth of the Merced River. This is not true. The objective exists (In Salt Slough, Mud Slough (north), and the San Joaquin River from Sack Dam to the mouth of the Merced River: 5.8 mg/L maximum; 2.0 mg/L monthly mean from 15 March through 15 September) but was inadvertently omitted from the fourth edition of the Basin Plan. This error will likely be rectified by the time the Board considers the proposed basin plan amendment. CVRWQCB-1

Section 2.1.1.2 discusses the Board's regulatory process, stating: *For discharge not under the control of any entity, there would be no legal entity for the WDRs"* [waste discharge requirements]. Uncontrolled does not necessarily mean uncontrollable, or that a responsible party could not be identified. CVRWQCB-2

Page 2-7 states that without a drainage outlet "there would likely be less analysis of new methods [of active land management] and a reliance on methods that are detrimental to crop production." Please explain why you think this would occur. CVRWQCB-3

Section 2.1.3 indicates that the Board would not need to issue orders for activities in the drainage area under the No Action alternative since there would be no discharge out of the area; and that the existing drainage management entity would not continue to coordinate and manage discharges or implement monitoring and reporting. The discussion should include the fact that irrigated land not regulated under WDRs in this region is regulated under a conditional waiver of WDRs, and that the area's irrigated land coalition would likely take on the CVRWQCB-4

coordination, monitoring and reporting functions now provided by the drainage management entity. CVRWQCB-4

There is an error on page 2-21. Basin plan amendments must undergo review and approval by the State Water Resources Control Board and Office of Administrative Law. Waste Discharge requirements that stem from a basin plan amendment cannot be issued before the amendment has been through these approvals, but the WDR itself is not subject to State Board or Office of Administrative Law approval. Basin plan amendments must also be approved by US EPA before they are considered final, but the Board does not need to wait for this step to be completed to issue WDRs that are not NPDES permits. CVRWQCB-5

The No Project alternative seems mischaracterized. Why would the "ongoing program for drainage management" cease if the Use Agreement were not extended? If the extension is not granted, wouldn't it simply mean the dischargers must employ more aggressive source control measures while the Project continues to develop to the point where all drainage can be managed to avoid violating water quality objectives? CVRWQCB-6

On a similar note, the report states: "once the effects of lack of an outlet lead the reuse area to become inoperative, there would be no incentive to continue the organized regional [drainage] effort." If the time extension is not granted, encumbered grant funds already allocated to continue implementation of Phase II would still be forthcoming. There is no evidence supporting the idea that drainage management capacity could not catch up to drainage production eventually or that the area would return to pre-Project conditions if the Use Agreement is not extended and the proposed basin plan amendment is not approved. The Project has succeeded in reducing drainage production and displacing drainage flows to a notable extent. The draft wrongly downplays these accomplishments in the No Action Alternative, leaving the impression that "no action" is the same as "past action produced no lasting benefit". CVRWQCB-7

I understand that the third alternative is not under serious consideration, as there is no environmental benefit to setting high load limits when lower limits are achievable. But the description of the alternative should mention how the Grassland Area Farmers would reach zero discharge in 2019: whether they would ramp down at some unspecified rate or continue discharging at 2010 levels until 2019. CVRWQCB-8

There are several instances where the document indicates that without a drainage outlet, contaminated groundwater seepage will threaten the wetlands. Please clarify whether the impact of seepage on the wetlands will be significant if the drainage outlet is blocked in 2010 rather than 2019. CVRWQCB-9

Definitions of alternatives eliminated from further analysis were omitted from the 2008 report. Please provide them. CVRWQCB-10

Elimination of the Conservation and Source Control alternative from further analysis is not justified. In 2001, conservation and source control measures alone would likely not have been sufficient to achieve the selenium reductions evidenced during the current term of the project, but the situation has changed. The report indicates that drainage production today exceeds Project capacity by only 3,400 AF/yr, on average. The Project's desired end point is appropriate long-term management of all drainage produced while sustaining water quality, wildlife habitat and long-term agricultural production. Conservation and source control will CVRWQCB-11

continue to be necessary to achieve these ends in a timely manner, so an alternative where these tactics are fully exploited is worth investigating. Given: 1) the decreasing amount of drainage that remains to be addressed in future years; 2) the funding already allocated to continued development of the San Joaquin River Water Quality Improvement Project (SJRIP) and pilot treatment facility; and 3) the current and probable future constraints on water supplies which will make temporary or permanent fallowing more attractive to some water users, there appears to be every reason to consider an alternative that relies heavily on a mix of temporary and permanent on-farm and regional conservation and source control measures to reduce drainage production to fully manageable levels sooner. CVRWQCB-11

The Integrated Farm Drainage Management (IFDM) alternative must be analyzed more fully. The report states: "If Phase III is not fully implemented because treatment is not feasible, then the reuse area would operate as long as possible and more drainage would be recirculated on-farm with resulting impacts on production." If regional treatment is infeasible, it is likely that there will be a greater need for on-farm drainage management measures. Dismissing IFDM as too expensive and impractical does a disservice to the farmers that may eventually need to resort to the technology to continue farming the area over the long-term. The Health and Safety Code allows IFDM to be implemented on a regional basis under certain circumstances, and the SJRIP concept is nearly identical to the reuse phase of IFDM-type systems used in the Tulare Lake Basin. If treatment proves infeasible, is there any reason the Grassland Area Farmers would not pursue a regional reuse alternative that eliminates the exposure pathway between wildlife and contaminants by some means other than treatment? CVRWQCB-12

Section 5.1.3 states that in 1999, more than 76,000 tons of imported salt was applied in the Grasslands Drainage Area (GDA). The Bureau reports that in 2008, 381,730 tons of salt were imported into the Grasslands subarea via the Delta Mendota Canal.[1] The subarea is larger than the GDA alone, but it is clear that the GDA's main water supply routinely imports a lot of salt. The model shows the Proposed Alternative resulting in a less-than-significant increase in soil salinity, and a significant beneficial impact (reduced salt concentration) in GDA groundwater. The model also shows soil salinity in the SJRIP leveling off over time as more tile lines are installed, with groundwater salinity also decreasing. The treatment system which is anticipated to come online in 2015 does not appear to be included in the model so salt reductions can't be a result of salt harvesting. With salt continuing to enter the drainage area, salt must be moving deeper into the aquifer. This is supported by the finding in 5.2.4 that regional increases in soil and groundwater salinity will increase on an ongoing basis and that this is a significant regional problem. Please make it clear that the modeled results are not intended to present the entire picture and provide an explanation as to why the long-term regional increase is considered acceptable. CVRWQCB-13

Section 8 (socioeconomic resources) states that recycling drain water on farm would result in "increased salinity levels and associated crop yield and revenue declines throughout the GDA." The section does not mention that the SJRIP has demonstrated that high value, salt tolerant crops like asparagus and pistachios can be grown with drainage or blended drainage and freshwater. If there are market, labor or other constraints that would discourage farmers from shifting to high value salt tolerant crops to maintain revenue as soil salinity levels rise, these should be disclosed. CVRWQCB-14

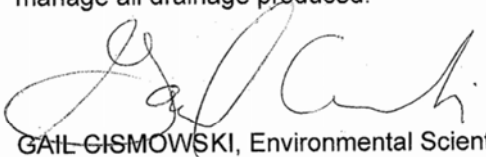
[1] Chris Eacock, personal communication 28 January 2009

Tables 12-7 and 12-8 provide further justification for investigation of a without-treatment alternative before identifying an environmentally superior alternative. While greenhouse gas thresholds of significance have not yet been established, it is clear that there will be environmental and economic costs associated with treatment that will differ from the environmental and economic costs associated with a project that uses some method other than treatment to eliminate wildlife exposure to selenium and other drainage constituents. CVRWQCB-15

Section 14 discusses short and long term impacts. Please provide approximate time frames that describe how "short-term" and "long-term" are used in this section. 14.1.2 mentions that salt increases but soils remain productive, and that soil boron and selenium increase. Is there a point where boron concentration in drainage area and SJRIP soils is expected to have more impact on productivity than salt? If yes, when? CVRWQCB-16

Section 15.2 states that daily sampling of Site D or E and Site H will be required. In 1999, Site H was removed from the monitoring program because a branch of the Merced River periodically enters the San Joaquin River above the Site H sampling location. Sampling crews have also experienced access problems at Site H. Board staff will discuss options for a more appropriate sampling location to assess compliance with the objective with the Data Collection and Reporting Team. CVRWQCB-17

Questions regarding the comments in this letter should be directed to Gail Cismowski (916-464-4608). The Grassland Bypass Project has been effective at implementing the Basin Plan's selenium control program for subsurface agricultural drainage and staff looks forward to additional water quality improvements as the Grassland Area Farmers develop the project to manage all drainage produced.



GAIL CISMOWSKI, Environmental Scientist
San Joaquin River Ag Unit

cc: Clay Rodgers, Fresno office
David Sholes, Fresno office
Anthony Toto, Fresno office
Kathy Woods, USFWS
Carolyn Yale, USEPA

RESPONSE CVRWQCB

California Regional Water Quality Control Board
Gail Cismowski, Environmental Scientist, San Joaquin River Ag Unit March 23, 2009

CVRWQCB-1
The comment is to update sections of the Document with the boron objective for Mud Slough and the San Joaquin River between Sack Dam and the mouth of the Merced River. The objective exists (Salt Slough, Mud Slough North, and the San Joaquin River from Sack Dam to the mouth of the Merced River) is 5.8 mg/L maximum; 2.0 mg/L monthly mean from March 15 through September 15. It was inadvertently left out of the fourth edition of the Basin Plan. The following pages in the EIS/EIR have been revised as follows:

Page ES-8,

Table ES-1 Summary of Impacts

Resource	No Action Alternative Compared to Existing Condition	Proposed Action Compared to No Action	Proposed Action Compared to Existing Condition	Alternative Action Compared to No Action	Alternative Action Compared to Existing Condition
Boron in Sloughs/SJR Upstream of Merced River	*Less- than-Significant Beneficial Impact* Boron concentrations in Mud Slough and SJR downstream of Mud Slough decrease~~;~~ ~~WQOs do not apply to these reaches~~. WQOs achieved more frequently.	*Negative Effect* Boron concentrations in Mud Slough and SJR downstream of Mud Slough increase~~;~~ ~~however, WQOs do not apply for these reaches~~. WQOs exceeded more frequently.	*Less-than-Significant Beneficial Impact* Boron concentrations decreased in Mud Slough and the SJR downstream of Mud Slough as a result of reduced discharges of drainwater; ~~WQOs do not apply for these reaches.~~ WQOs are exceeded with the same frequency as existing conditions for Mud Slough.	*Negative Effect* Boron concentrations in Mud Slough and SJR downstream of Mud Slough increase~~;~~ ~~however, WQOs do not apply for these reaches~~. WQO are achieved less frequently, similar to the Proposed Action.	*Less-than-Significant Beneficial Impact* Boron concentrations in Mud Slough and SJR downstream of Mud Slough decrease as a result of reduced discharges of drainwater~~; WQOs do not apply for these reaches~~. . WQOs are exceeded with the same frequency as existing conditions for Mud Slough.

Page 4-7

Table 4-1 Water Quality Objectives, Performance Goals, and Compliance Dates for the Lower San Joaquin River

Waterbody	Selenium	Boron	Molybdenum	Electrical Conductivity
Salt Slough and Wetland Water Supply Channels	▪ 2 ppb, monthly mean, October 1, 1996 ▪ 20 ppb, maximum	▪ 2.0 ppm, monthly mean, March 15-September 15[1,2] ▪ 5.8 ppm, maximum, March 15-September 15[1,2]	▪ 0.050 ppm, maximum ▪ 0.019 ppm, monthly mean	
Mud Slough (North) and the San Joaquin River from Sack Dam to the Merced River	▪ 5 ppb, 4-day average, October 1, 2010 ▪ 20 ppb, maximum	▪ 2.0 ppm, monthly mean, March 15-September 15[1] ▪ 5.8 ppm, maximum, March 15-September 15[1]	▪ 0.050 ppm, maximum ▪ 0.019 ppm, monthly mean	

Source: Regional Board, 1998 Basin Plan; Regional Board 1988.

[1] Regional Board 1988.
[2] Water Quality Objective applies to Salt Slough.

Pages 4-26, 4-27, and 4-28

Water quality in Mud Slough (North) downstream of the Drain discharge (Station D) is governed by the discharge drainwater quality and is elevated with respect to salinity, Se, and boron (Regional Board 2008). Downstream Se concentrations ranged between 2.4 µg/L and 54.9 µg/L with a mean of 18 µg/L (Figure 4-8). Although direct comparison to the 5 µg/L 4-day average WQO is not feasible with the weekly data, measured concentrations were rarely less than 5 µg/L during this period. ~~Boron concentrations averaged 3.7 mg/L during Water Years 2002–2007. The average EC was 2,710 µmhos/cm (approximately 1,870 mg/L TDS, when the EC-TDS ratio of 0.69 was used). Highest concentrations are generally found during the spring and summer.~~

Figure 4-9a shows pre-Project and post-Project Se concentrations in Mud Slough (North) downstream of the Drain (Station D). Mean annual Se concentrations have decreased after the start of the Project in October 1996, from a concentration of 30.3 µg/L during Water Year 1997 to a concentration of 13.1 µg/L in Water Year 2006. The mean annual Se concentration increased in Water Year 2007, which was a Critical year, to 16.3 µg/L.

Water quality data for Station I2 are not available.

Downstream of the Drain, boron concentrations ranged between 1.1 mg/L and 7.7 mg/L with an average of 3.7 mg/L during Water Years 2002–2007. Approximately 25 percent of the weekly monitoring data was above 5.8 mg/L boron during the irrigation season. Monthly mean boron concentrations were greater than 2 mg/L during the irrigation season each of these years (Figure 4-9b).

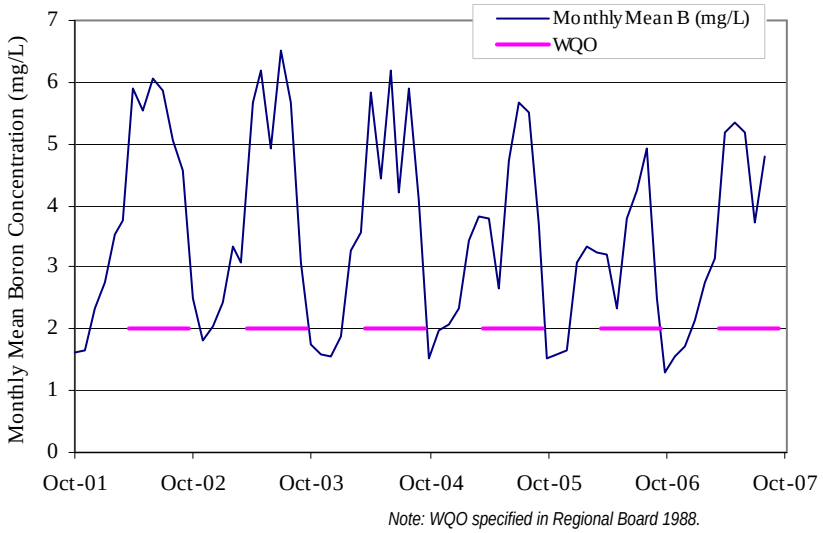


Figure 4-9b Boron Concentration in Mud Slough (North) downstream of drainage discharge (Station D) for Water Years 2002–2007

For Station D, the average EC was 2,710 µmhos/cm (approximately 1,870 mg/L TDS, when the EC-TDS ratio of 0.69 was used). Highest concentrations are generally found during the spring and summer.

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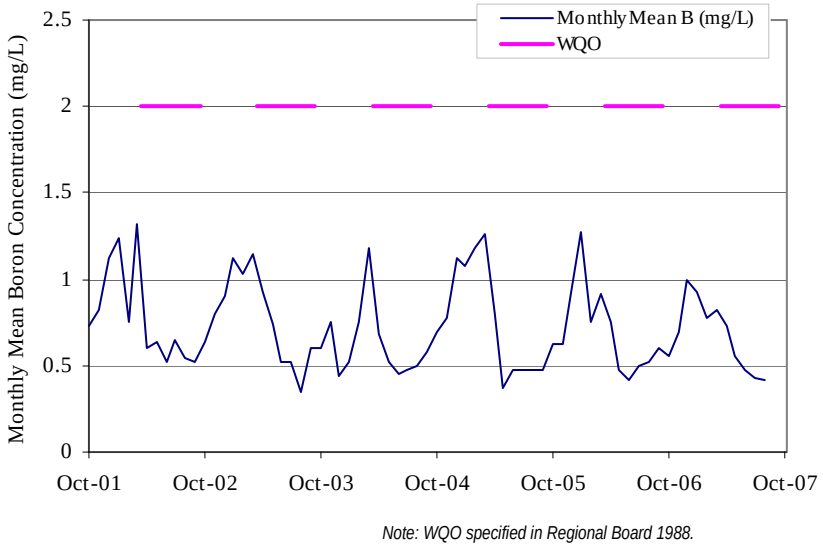
Boron concentrations ranged between 0.3 mg/L and 2.4 mg/L with an average of 0.8 mg/L during Water Years 2002–2007. ~~The mean boron concentration for Water Years 2002–2007 was 0.8 mg/L.~~ Boron concentrations were below 5.8 mg/L and monthly mean concentrations were below 2 mg/L during the irrigation season for this period (Figure 4-11b). Measured EC averaged 1,350 µmhos/cm for this same time period (approximately 920 mg/L TDS when the EC-TDS ratio of 0.68 was used to convert between EC and TDS).

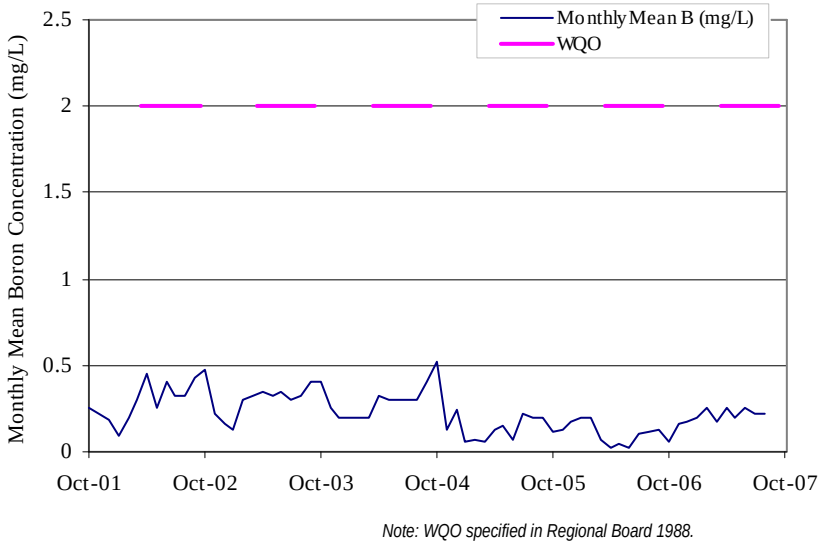


Note: WQO specified in Regional Board 1988.

Figure 4-11b Boron Concentration in Salt Slough at Lander Avenue (Station F) during Water Years 2002–2007

Page 4-32

No monitoring was performed in this river reach as a part of the Grassland Bypass Project. Water quality was characterized based on monitoring conducted in Water Years 2002–2007 by the Regional Board. During Water Years 2002–2007, measured Se concentrations were below 5 µg/L and the average Se concentration was less than 0.3 µg/L (Figure 4-12). The average concentration of boron was 0.2 mg/L for this 6-year monitoring period (Figure 4-12b). Average EC was 1,130 µmhos/cm.

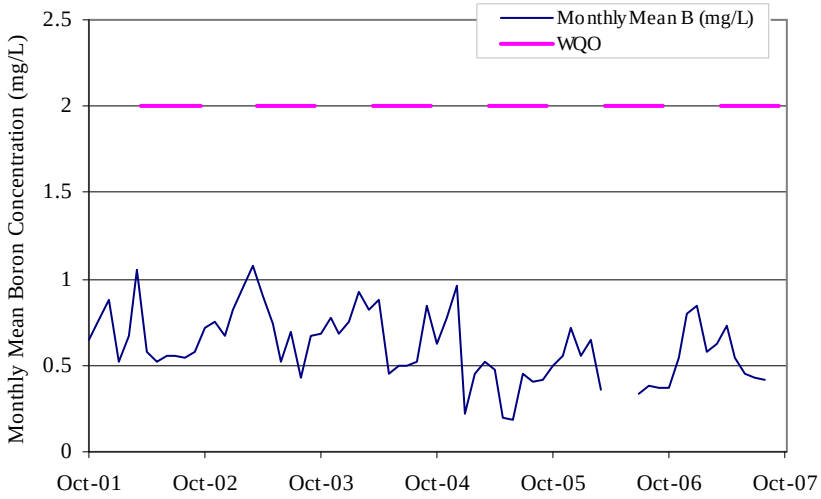


Note: WQO specified in Regional Board 1988.

Figure 4-12b Boron Concentration in the San Joaquin River at Lander Avenue during Water Years 2002–2007

Page 4-38 and 4-40

Since this site is located upstream of the GDA discharge point into the San Joaquin River, it has lower measured Se concentrations than downstream monitoring sites located on the San Joaquin River. Water quality has improved at Fremont Ford as a result of the Grassland Bypass Project. This improvement is evident in a comparison of the pre-Project and post-Project concentrations of Se, boron, and EC based on long-term monitoring data collected by the Regional Board and the Grassland Bypass Monitoring Program. During the pre-Project period (Water Years 1988–1996) the mean Se concentration was 12 µg/L (Figure 4-20). During Water Years 2002–2007 measured Se concentrations were below 5 µg/L and the mean Se concentration decreased to 0.5 µg/L (Figure 4-21). Similarly, during the pre-Project monitoring period the mean boron concentration was 1.7 mg/L. During Water Years 2002–2007 the mean boron concentration was 0.6 mg/L, and maximum and monthly mean concentrations were below the objectives (Figure 4-21b). In contrast, EC increased somewhat between the two monitoring periods from a mean of 1,030 µmhos/cm during the pre-Project period to a mean of 1,390 µmhos/cm during Water Years 2002–2007.



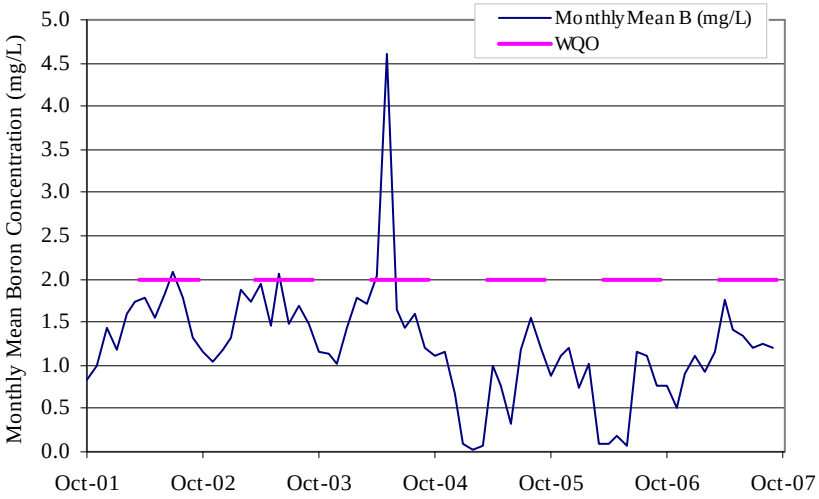
Note: WQO specified in Regional Board 1988.

Figure 4-21b Boron Concentration in San Joaquin River at Fremont Ford (Station G) for Water Years 2002–2007

Page 4-41 and 4-42

Water at this site can be elevated with respect to salt, Se, and boron. Total Se averaged 4.0 µg/L in this reach of the San Joaquin River during Water Years 2002–2007. Measured Se concentrations ranged from less than 0.4 to 13.2 µg/L, with an average of 4.0 µg/L (Regional Board and SFEI data; Figure 4-22). ~~The average boron concentration was 1.3 mg/L. Measured EC averaged 1,670 µmhos/cm for this same time period (approximately 1,140 mg/L TDS, when the TDS/EC ratio of 0.68 was used to convert between EC and TDS).~~ Direct comparison of measured Se concentration to the 5 µg/L 4-day average WQO is not possible from weekly data; however, Se concentrations during Water Years 2000–2007 are generally lower than pre-Project conditions (Figure 4-23a). Water Years 1988–1996 had an average annual Se concentration of 9.7 µg/L. Water Years 2002–2007 had an average annual Se concentration of 3.9µg/L.

For Station H, boron concentrations ranged between 0.1 mg/L and 7.1 mg/L with an average of 1.3 mg/L during Water Years 2002–2007. Less than one percent of the weekly monitoring data was above 5.8 mg/L boron during the irrigation season (March 15 to September 15). Monthly mean boron concentrations were greater than 2 mg/L during approximately 12 percent of the irrigation season (Figure 4-23b). Monthly mean concentrations were above 2 mg/L during July 2002, June 2003, the second half of March 2004, and April to May 2004.



Note: WQO specified in Regional Board 1988.

Figure 4-23b Boron Concentration in San Joaquin River at Hills Ferry (Station H) for Water Years 2002–2007

Measured EC averaged 1,670 µmhos/cm for Water Years 2002–2007 (approximately 1,140 mg/L TDS, when the TDS/EC ratio of 0.68 was used to convert between EC and TDS).

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4.2.2.4.4 Mud Slough (North) Downstream of San Luis Drain Discharge

Boron, molybdenum, and TDS concentrations are predicted to decrease slightly for most water years as a result of the Project. The monthly average boron concentrations from March through September in Mud Slough downstream of the Drain are predicted to be greater than 2 mg/L every month from 2010 to 2019. Because boron concentrations are expected to decrease over course of Proposed Action, but the frequency of excursions above the WQO are predicted to remain the same, changes to boron concentrations have a less than significant beneficial impact in comparison to existing conditions.

Molybdenum concentrations are predicted to frequently be higher than the 19 µg/L WQO from 2010 through 2014. Starting in 2015, molybdenum concentrations are only predicted to be higher than the 19 µg/L WQO for some months during Critical water years. The frequency of these excursions above the WQO is predicted to decrease as compared to existing conditions, a beneficial impact.

There are no WQOs for ~~boron or~~ TDS for Mud Slough.

Page 4-60

4.2.2.4.5 San Joaquin River (Mud Slough to Merced River)

Water quality in the San Joaquin River upstream of the confluence with the Merced River is predicted to improve over the course of the 10-year Project relative to existing

conditions (a beneficial impact) due to the decreases in the load of Se, salt, molybdenum, and boron necessary to comply with the discharge load limits. Water quality is predicted be poorer at this site as compared to the No Action Alternative due to the impact of poor quality drainwater discharges as opposed to the No Action assumption of no discharge.

No specific WQOs are designated for ~~boron or~~ TDS for this reach of the river.

The 4-day average Se WQO for San Joaquin River upstream of Merced River is subject to a schedule that requires compliance by October 1, 2010. Se concentrations may not meet this compliance schedule; however, Se concentrations are expected to decrease over the course of the Proposed Action due to decreases in the Se load allocation for the Drain. Boron concentrations are also expected to decrease over the course of the Proposed Action.

Concentrations of Se, boron, molybdenum, and TDS would increase compared to the No Action Alternative.

Page 4-73 for Proposed Action

4.2.4.2.1 Impacts in Sloughs and in the San Joaquin River Upstream of the Confluence with the Merced River

- These reaches do not have WQOs for salinity ~~or boron~~. Therefore, the beneficial impact is less than significant for salinity ~~and boron~~. Although predicted concentrations may be lower, the WQOs for boron would be exceeded with the same frequency as existing conditions, a less-than-significant impact. WQOs for molybdenum would be exceeded less frequently as compared to existing conditions, a beneficial impact. Concentrations of Se, boron, molybdenum, and salinity would increase compared to the No Action Alternative.

Page 4-71 for Alternative Action

4.2.4.3.1 Impacts in Sloughs and in the San Joaquin River Upstream of the Confluence with the Merced River

- These reaches do not have assigned WQOs for salinity ~~or boron~~. Therefore, the beneficial impact is less than significant for salinity ~~and boron~~. Although predicted concentrations of boron may be lower, the WQOs for boron would be exceeded with the same frequency as existing conditions, a less-than-significant impact. WQOs for molybdenum would be achieved more frequently under this alternative, a significantly beneficial impact. Concentrations of Se, boron, molybdenum, and salinity would increase compared to the No Action Alternative.

Page 4-77

Water Quality Parameter	No Action Alternative Compared To Existing Condition	Proposed Action Compared To No Action	Proposed Action Compared To Existing Condition	Alternative Action Compared To No Action	Alternative Action Compared To Existing Condition
Boron in Sloughs/SJR Upstream of Merced River	~~*Less- than-*~~*Significant Beneficial Impact* Boron concentrations in Mud Slough and SJR downstream of Mud Slough decrease; ~~WQOs do not apply to these reaches~~. WQOs achieved more frequently.	*Negative* Boron concentrations in Mud Slough and SJR downstream of Mud Slough increase~~; however, WQOs do not apply for these reaches~~. . WQOs exceeded more frequently.	*Less-than-Significant Beneficial Impact* Boron concentrations decreased in Mud Slough and the SJR downstream of Mud Slough as a result of reduced discharges of drainwater; ~~WQOs do not apply for these reaches.~~ WQOs are exceeded with the same frequency as existing conditions for Mud Slough.	*Negative* Boron concentrations in Mud Slough and SJR downstream of Mud Slough increase~~; however, WQOs do not apply for these reaches~~. WQO are achieved less frequently, similar to the Proposed Action	*Less-than-Significant Beneficial Impact* Boron concentrations in Mud Slough and SJR downstream of Mud Slough decrease as a result of reduced discharges of drainwater~~; WQOs do not apply for these reaches~~. WQOs are exceeded with the same frequency as existing conditions for Mud Slough.

Page 17-9

Table 17-1 Water Quality Objectives, Performance Goals, and Compliance Dates for the Lower San Joaquin River

Waterbody	Selenium	Boron	Molybdenum	Electrical Conductivity
Salt Slough and Wetland Water Supply Channels	▪ 2 ppb, monthly mean, October 1, 1996 ▪ 20 ppb, maximum	▪ 2.0 ppm, monthly mean, March 15-September 15[1,2] ▪ 5.8 ppm, maximum, March 15-September 15[1,2]	▪ 0.050 ppm, maximum ▪ 0.019 ppm, monthly mean	
Mud Slough (North) and the San Joaquin River from Sack Dam to the Merced River	▪ 5 ppb, 4-day average, October 1, 2010 ▪ 20 ppb, maximum	▪ 2.0 ppm, monthly mean, March 15-September 15[1] ▪ 5.8 ppm, maximum, March 15-September 15[1]	▪ 0.050 ppm, maximum ▪ 0.019 ppm, monthly mean	

Source: Regional Board, 1998 Basin Plan; Regional Board 1988.

[1] Regional Board 1988.

[2] Water Quality Objective applies to Salt Slough.

REFERENCES

Regional Board. 1988. Adoption of Amendments to the Water Quality Control Plan for the San Joaquin River Basin (5C). Resolution No. 88-195.

CVRWQCB-2

The comment saying "uncontrolled does not necessarily mean uncontrollable" is noted; however, either organized entities with drainage management systems or else individual discharges would be regulated. The applicable regulatory tools are adequately covered in prior bullet points, so the language in Section 2.1.1.2 will be deleted.

- ~~For discharge not under the control of any entity there would be no legal entity for the WDRs has been identified.~~

CVRWQCB-3

The comment is noted. The last sentence of the language for first bullet (Active land management program) on page 2-7 will be modified to read:

> Without such a regional organization to pool resources to investigate new methods for regional drainage management that allow for cost-effective and productive crop management on individual farms as well as at the regional facility, there would likely be less analysis of new methods and farmers forced to respond to regulations would be more likely to persist with known and individually implementable methods even when detrimental to crop production.

CVRWQCB-4

Concerning Section 2.1.3, final two sentences will be replaced with the following text:

> However, if the land continues to be irrigated and subject to discharges of surface water, including stormwater, those lands would be subject to regulation by the Regional Board, for example, under the Irrigated Lands Regulatory Program. Because the GDA is subject to WDRs at present, there is no existing watershed coalition serving the GDA, and individuals would either need to join an existing coalition, form a new coalition or be individually regulated. Irrigated land not regulated under WDRs in this region is regulated under a conditional waiver of WDRs.

CVRWQCB-5

The error on page 2-21 has been corrected.

> The ~~Regional Board and~~ State Water Resources Control Board (State Board) and Office of Administrative Law will need to approve a Basin Plan Amendment to defer the compliance deadlines for the water quality objectives in Mud Slough and the San Joaquin River between Mud Slough and the confluence with the Merced River. The basic basin planning procedure is as follows: scoping, environmental study, staff report, Regional Board hearing, and Regional Board adoption. Following approval of the Basin Plan Amendment, ~~T~~the Regional Board will prepare revised WDRs for the proposed 2010 Use Agreement. The revised WDRs do not require State Board approval, Office of Administrative Law approval, and U.S. Environmental Protection Agency (USEPA) approval. The Basin Plan Amendment must be approved by the USEPA, but the Regional Board does not have to wait for this approval to be completed in order to issue WDRs that are not NPDES permits. If the Basin Plan Amendment is not final by October 1, 2010, the prohibition of discharge becomes effective in Mud Slough (North) and the San Joaquin River from Sack Dam to the mouth of the Merced River unless water quality objectives are met. If the GAF do not comply with the prohibition/objective, the California Water Code gives the Regional Board the authority to take a variety of different enforcement actions to achieve compliance. The Regional Board would consider the circumstances at the time to determine which enforcement action is appropriate.

CVRWQCB-6
The commenter thinks the No Action alternative is mischaracterized and questions why ongoing drainage management would cease and why "dischargers" wouldn't simply employ more aggressive source control while the Project continues to develop to the point that all drainage can be managed to avoid violating water quality objectives.

First, Section 4.1.1 indicates that the No Action Alternative is based upon continuing an ongoing program for drainage management, including use of the drainage reuse area, as a partial program (see page 2-2, paragraph 2.1.1). No Action does not assume no ongoing drainage management. Second, the comment fails to grasp that without a drainage outlet, there is, by definition, no Grassland Bypass Project, because the Grassland Bypass Project's essential characteristic is use of the San Luis Drain as a drainage conveyance.

The organization, good will and momentum of the Grassland Bypass Project has created regional unification in the face of historic legal and philosophical tensions among the various participants. Some participants support the Project based on the belief that their lands are being protected by maintaining a drainage outlet until long term treatment solutions or out of valley drainage can be accomplished. Consensus support from stakeholders and regulators has boosted willingness to take on the significant challenge. Regional cooperation has enhanced the ability to attract grants that mean treatment is feasible. If there is No Action, meaning no continued GBP, the willingness of the parties to continue unified, regional efforts is not assured.

As noted in Section 2.1.1.2, without the GBP, regulatory efforts become focused at the District or individual farmer levels, parties not currently identified as "dischargers." Once individual regulatory controls create pressure for district-by-district or landowner-by-landowner "increased source control efforts," the highest priority for district and individual efforts will be focusing all necessary resources to address those pressures, likely with a loss of time and momentum during the changeover of the regulatory system. Without the GBP, State grant funding obtained for a pilot treatment project and other improvements would be used up to the extent available, but future funding coordination would be less likely. Use of the reuse areas would continue so long as viable, although under terms of existing agreements those areas could be split to serve different groups within the GBP participants, rather than operated as a single unit. The only existing regional management alternative is the Westside Regional Drainage Plan, which could possibly become the regional project. However the WRDP lacks the operating history of the GBP. Importantly, it relies on continuation of the GBP for an additional period as a key component to long-term regional drainage management. Therefore, No Action does not simply translate into a hiccup where all the regional momentum will continue until an identified project moves forward to resolve the remaining challenges. The effects of No Action are not mischaracterized.

CVRWQCB-7
See response to CVRWQCB-6.

CVRWQCB-8
How would the Grassland Area Farmers reach zero discharge in 2019 under the Alternative Action, by ramping down or continuing to discharge at 2010 levels until 2019 (per questioner)? As it takes time and resources to develop the tools necessary to achieve zero discharge, it is

likely the same ramping down as the Proposed Action would be achieved. There would not, however, be the additional incentive fees or mitigation that is required under the Proposed Action.

CVRWQCB-9

Without the Project, uncontrolled seepage and subsurface discharge into unlined ditches and drainage canals can flow into sloughs and wetlands. This discharge is proportional to water table depth, and increases as the water table rises. The groundwater-flow model simulates water table and seepage changes, and therefore provides a minimum estimate of uncontrolled discharge. Results indicated that if the drainage outlet is blocked in 2010 (the No Action Alternative), uncontrolled discharge more than doubles by 2019. In contrast, under the Proposed Project uncontrolled discharge decreases by almost 90 percent. The impact of uncontrolled discharge on wetlands is, therefore, presumably greater if the drainage outlet is blocked in 2010 rather than 2019.

CVRWQCB-10

Descriptions of alternatives 2 and 4 through 20 contained in Table 2-3 have been added to the text in Section 2.4.1 of the EIS/EIR as follows:

> ALTERNATIVE 2: FLIP FLOP SYSTEM FROM 1995
>
> This alternative was the No Action alternative in the 1995 Finding of No Significant Impact on the original project. It means the Grassland Farmers would revert to the "flip flop" system in place from 1985-1995. This alternative consists of the following major components:
>
> - Wetlands supply conveyance channels would be managed to convey alternately agricultural drainage water or clean water for wildlife refuges.
> - Discharge of drainage at some time during the year to approximately 93 miles of channels currently utilized for refuge/wetland water deliveries. Drainage water would enter either the Agatha Canal or the Camp 13 Ditch. When one channel is carrying drainage water, the other would be used to convey fresh water to the wetlands. Then, the system is switched and wetlands along the other channel can receive fresh water. When switching between drain water to fresh water, the channel would be flushed for about 24 hours.
> - Near Henry Miller Road at the Los Banos Wildlife Management Area, most of the drainage water would be diverted and conveyed through a channel known as the Porter-Blake Bypass. The permit for use of this facility has expired and permission would be required from the San Luis Canal Company and the Department of Fish and Game (DFG). At times, flow would be through the San Luis Canal and Santa Fe Canals to Mud Slough. During this time, those channels could not be used for conveyance of fresh water.
>
> ALTERNATIVE 4: 1990 PROPOSED PROJECT
>
> Drainage water is collected and discharged to the San Luis Drain at a point approximately 1.3 miles south of Hwy 152 and travels only 19 miles in the Drain. Drainage water would

enter the Drain just north of the south Grassland area, and would still flow via the flip flop system through the south Grassland channels. Agatha Canal and Camp 13 Ditch would be used as described in Alternative 2 above.

ALTERNATIVE 5: SALT SLOUGH

The San Luis Drain would discharge to Salt Slough on the east side of Kesterson National Wildlife Refuge. Drainage waters would continue to flow through the enlargement of the San Luis Canal through the Kesterson Refuge and Freitas Ranch, to Salt Slough within the Freitas Ranch, to its intersection with the San Joaquin River. Drainage water would flow through 23 miles of Salt Slough and would be eliminated from the southerly part of Salt Slough and from 6 miles of Mud Slough. This alternative would require construction of new canals. (As of September 1999, no drainage from the Grassland Drainage Area has been discharged into Salt Slough.)

ALTERNATIVE 6: USE THE SLD WITH DISCHARGES TO BOTH MUD AND SALT SLOUGHS

This alternative is a combination of Alternatives 3 and 5. Drainage water would be discharged to both sloughs, and the alternative assumes a need to dilute the drainage by partial discharge to each.

ALTERNATIVE 7: OTHER PROPOSALS FOR USE OF SAN LUIS DRAIN-OTHER ENTRY POINTS

If up to 10,000 acres are added to the Grassland Drainage Area, then use of another entry point downstream of Check 19 is possible, adjacent to the new area. The existing Grassland Bypass Channel would be the primary entry point. Other entry points would likely involve improvement of an existing channel. This alternative would not involve channel construction in the refuges.

ALTERNATIVE 8: EAST SIDE BYPASS CHANNEL

The Eastside Bypass is a local flood control facility located along the east side of the San Joaquin River. To use it to convey drainage, construction of a new channel and siphon to connect with it would be necessary. It would discharge back to the San Joaquin River along the easterly boundary of the San Luis National Wildlife Refuge, approximately 18 miles upstream of the Merced River.

ALTERNATIVE 9: CONSTRUCT NEW CHANNEL

Rather than use the San Luis Drain, the Grassland Area Farmers would construct a new channel through the wetlands with discharge into the San Joaquin River above its confluence with the Merced River.

ALTERNATIVE 10: ON-FARM WATER CONSERVATION AND SOURCE CONTROL

Alternative 10 implements on-farm measures to manage, reduce, or eliminate controlled drainage production at its source. It includes the following programs accelerated beyond the level of the No Action alternative:

- Active land management (to change cropping patterns including salt-tolerant crops)

- Pre-irrigation Economic Incentive Programs (including tiered water pricing and tradable loads)
- Irrigation Season Economic Incentive Programs (including tiered water pricing and tradable loads)
- Other source control (including soil erosion control) in the watershed (not implemented to date)
- Retirement from farming of small amount of most severely drainage-impacted land
- Sump management
- Tailwater prohibition
- Recycling of irrigation return flows
- Recycling/displacement of subsurface drainage
- Improved irrigation technology and efficiency

ALTERNATIVE 11: IN-VALLEY TREATMENT AND DISPOSAL

Alternative 11 removes dissolved constituents from problem water, thereby creating potentially reusable water and reducing the drainage stream that would need to be discharged or otherwise managed. Potential methodologies being tested include:

- Panoche membrane removal
- Broadview flow through wetlands
- Panoche algal-bacterial selenium removal facility
- Firebaugh filtration treatment process
- Drying and disposal of salts
- Integrated farm management systems (including agroforestry)
- Other advanced treatment technologies to remove selenium, salts, or other constituents (such as reverse osmosis) with the treated water being reused, managed within the region, discharged to the San Joaquin River system and the solids disposed locally.

ALTERNATIVE 12: COMPLETE SAN LUIS DRAIN WITH OUT-OF-VALLEY DISCHARGE

This alternative is the completion of the San Luis Drain to convey drainage out of the San Joaquin Valley without using the San Joaquin River. The ultimate discharge point (ocean, Bay, salt sink, or Delta) would need to be determined. This alternative was refined and evaluated as part of the San Luis Drainage Feature Re-evaluation Final EIS/EIR (URS 2006).

ALTERNATIVE 13: EXTENSION OF THE SAN LUIS DRAIN TO SAN JOAQUIN RIVER

Extend the Drain directly to the San Joaquin River to a point downstream of its confluence with the Merced River, and avoid using Mud Slough to convey drainage water. This alternative would use a canal or pipeline to extend the Drain, and was

evaluated in the 2001 Grassland Bypass Project EIS/EIR as the Mud Slough Bypass Alternative.

ALTERNATIVE 14: CONSTRUCTION OF NEW DRAIN

Do not use San Luis Drain; construct an alternative drain that would convey only agricultural drainage and discharge it directly to the San Joaquin River at a point downstream of the Merced River. This option is a variation of Alternative 9; the discharge point is slightly different.

ALTERNATIVE 15: LAND RETIREMENT

All or a major portion of agricultural land in the Grassland Drainage Area would be retired (not farmed). The assumption is that marginal lands would not be farmed or would be used to grow salt-tolerant crops or other plants/trees as is being done at the SJRIP reuse facility. The "retired water" could be applied to other agricultural lands in the Grassland Drainage Area, allocated to water users outside of the Grassland Drainage Area (on a voluntary basis or through institutional change), or used for fish and wildlife purposes.

ALTERNATIVE 16: REAL TIME OPERATIONS

Time the releases of subsurface drainage discharges to match variations in the assimilative capacity of the San Joaquin River. Operations would most likely include surface storage facilities, sump control, recirculation, and other actions. Alternative 16 would likely require construction of storage facilities.

ALTERNATIVE 17: GROUNDWATER MANAGEMENT

Pump groundwater of suitable quality to remove excess groundwater (high water table affecting root zone) and lower the water table, thereby reducing the need for drainage conveyance in the short term. Use the pumped water as a supplemental irrigation supply (either directly or blended with surface water) or as a supplemental supply for fish and wildlife. A groundwater pumping/water transfer project was recently approved (October 5, 2007) by the San Joaquin River Exchange Contractors Water Authority and the affected districts (Firebaugh Canal Water District) and Central California Irrigation District (CCID).

ALTERNATIVE 18: SAN JOAQUIN VALLEY DRAINAGE PROGRAM RECOMMENDED PLAN FOR THE GRASSLANDS SUBAREA

The 1990 Plan (known as the Rainbow Plan, SCVDP 1990) recommendations are essentially the currently implemented drainage management program including use of the SLD for conveyance of drainage water to the San Joaquin River. Specific elements in the 1990 Plan include source control (Alternative 10), drainage water reuse (Alternative 10), evaporation ponds (Alternatives 10, 11), groundwater management (Alternative 17), land retirement (Alternative 15), and discharge to wetlands and/or the San Joaquin River (Alternatives 1, 3, 4, 5, 6, 8, 9, 13, 14, 16).

The 1999 Plan also includes the following elements: (1) protection, restoration, and provision of substitute water supplies for fish and wildlife habitat; and (2) institutional change. Institutional change includes tiered water pricing, scheduling of water deliveries, water transfers and marketing, and regional drainage management entities.

ALTERNATIVE 19: REDUCE DRAINAGE BY DEPRIVING SELENIUM-IMPACTED LANDS OF IMPORTED SURFACE WATER

The objective here is to substantially reduce selenium loads by depriving selenium-impacted areas of imported surface-water for irrigation. This alternative reduces deep percolation of imported surface water, which reduces drainage volumes. Where groundwater of suitable quality is available for irrigation, production of a limited variety of crops can continue. Any land owners with pre-1914 appropriative or riparian water rights would probably continue to irrigate with surface water, in which case the reduction in drainage from these lands may be minor.

ALTERNATIVE 20: INTEGRATED ON-FARM DRAINAGE MANAGEMENT

Integrated On-Farm Drainage Management (IFDM) system was developed to manage salt, selenium, boron and other naturally occurring elements in surface and groundwater supplies in some agricultural areas of the state. A state-of-the-art, yet practical management system, the IFDM manages irrigation water on salt-sensitive high value crops and reuses drainage water to irrigate salt-tolerant crops, trees and halophyte plants. Salt and selenium are removed from the farming system and can be marketed. Simply stated, the grower sequentially reuses drainage water to produce crops with varying degrees of salt tolerance. A solar evaporator receives the final volume of drainage water; this water evaporates and salt crystallizes. Plants absorb selenium, which may be volatilized; or accumulate in the plant tissue. Of the remaining selenium some will remain in the soil and some will be contained in the final effluent to become a component of harvested salt. There is no discharge of salts and selenium into rivers or evaporation ponds. Drainage water, salts and selenium are managed on the farm. This alternative has been implemented at Red Rock Ranch. (DWR 2009)

CVRWQCB-11

The comment is to more fully implement conservation and source control. Conservation and source control are already maximized under the proposed alternative. This alternative would not stand alone without the other project components such as reuse and treatment. For example the districts in the drainage area continue to develop funding for canal lining and subsurface drip irrigation. The time to fully implement these project components exceeds the 2009 deadline in the 2001 Use Agreement; therefore, additional time is needed.

CVRWQCB-12

The comment is to more fully analyze IFDM (Alternative 20 above). The Grassland Bypass Project includes the elements of IFDM with two exceptions. First, the GBP is a regional scale IFDM project rather than an individual, farm level IFDM project. The regional scale helps to pool financial resources and ensure monitoring is accomplished. The GBP may include solar evaporation, which is being used at Red Rock Ranch, in the final treatment stage. A final

environmental review will be done at that time. The regional system has been significantly implemented and been successful in meeting discharge requirements. To now abandon the regional infrastructure and go back to IFDM would be a significant waste of the monies expended. The regional system also has the cost benefits of pooled management and operation that the IFDM does not enjoy. Although certain farmers are more than capable of operating an IFDM system on-farm, it is a stretch to think that every farmer would have this capability.

CVRWQCB-13

The simulated soil and groundwater salinity changes reported in Section 5 and Appendix D do not include all possible fates for salt. A fraction of the salt is stored in the unsaturated zone (considered by the salinity modeling), another fraction is discharged in drainage, and the remaining salt can move past the drainage systems and into the deeper groundwater system.

In the No Action Alternative, the simulated salinity in groundwater recharge increases with time yet simulated groundwater salinity decreases. As reported in Appendix D, the salinity decline may indicate specified initial groundwater salinity is high relative to modeled soil and irrigation water salinity (initial groundwater salinity was specified from drainflow quality data). The Proposed Action Alternative had similar results, however the salinity decrease is greater than simulated under the No Action Alternative. Therefore, Grassland Bypass Project was considered to have a positive effect on groundwater salinity.

Increases in soil and groundwater salinity are an unavoidable consequence of all irrigated agricultural operations, and are not specific to the western San Joaquin Valley. While salt management within the Grassland Drainage Area benefits the regional salt balance, the primary purpose for the Project is to manage salt within the Grassland Drainage Area.

CVRWQCB-14

While the SJRIP has demonstrated that high value, salt tolerant crops can be grown with blended drainage water, shifting the entire 98,500 acres to just these limited crops would not be practical for maintaining the viability of all of the affected farms. Also, the most widely planted reuse area crops to date, such as Jose Tall Wheatgrass and pasture, are not those with sufficient value to support the cost of irrigation water for portions of the GDA served by CVP water service contracts and supplemental water. As discussed in Section 8.1.3, as drainwater is recirculated on-farm, soil and water salinity build up and crop yields are impacted. None of the crops can sustain indefinite increases in soil salinity. Salt-sensitive, high value crops such as tomatoes and melons traditionally were replaced with lower value, salt-tolerant cotton and sugarbeets. Changes in world market conditions, farm programs and other economic factors, as well as the high cost and limited availability of irrigation water in parts of the GDA, have vastly reduced the farmers' ability to switch to cotton or sugar beets for the foreseeable future.

CVRWQCB-15

Comment noted and considered. Construction of treatment facilities will be a separate project subject to environmental review. All energy intensive actions produce greenhouse gas emissions. Until the modality is identified, it is impossible to quantify and project differences in GHG emissions from treatment vs. non-treatment alternatives.

CVRWQCB-16

Short term impacts are those occurring within a 5 year period 2010-2014, while long-term would be those beyond 2014.

HydroFocus utilized Deverel and Millard's (1988) published regression equations to estimate boron concentration changes due to projected groundwater salinity changes. The end of the salinity projection corresponds with the end of the Proposed Action (2019), and modeled scenarios were not continued past 2019. Therefore, conclusions regarding simulated salinity and boron changes past 2019 are speculative and necessarily based on a visual projection of the simulated trends in Figure 8 of Appendix D.

Figure 8 shows the simulated annual rate of salinity rise for both the No Action and Grassland Bypass Project alternatives. The annual increase in soil salinity decreases with time, and by 2019 becomes somewhat imperceptible (i.e., the salinity concentrations level off and approach equilibrium conditions). Hence, simulated soil salinity is not expected to increase substantially beyond 2019 without a change in the quality of the irrigation water supply, water application rates, and so forth. Accordingly, simulated boron concentrations are also not expected to increase substantially beyond 2019.

Salt and boron impacts are determined by plant toxicity and described in terms of threshold values and threshold intervals. A threshold is a concentration limit, whereby the plant can withstand concentrations less than the threshold without experiencing adverse effects in yield. It is difficult to generalize relative future impacts from salt and boron concentration increases because (1) threshold values are plant specific; and, (2) the relationship between salt and boron thresholds is not necessarily one-to-one (i.e., a salt tolerant plant is not always a boron tolerant plant). Rising salinity levels can therefore impact salt sensitive crops before reaching the boron threshold for the same plant (for example, tomato has a salinity threshold of only 2.5 dS/m but a boron threshold of 5.7 mg/L). In contrast, wheat is relatively salt tolerant and its boron threshold (0.75-1.0 mg/L) would be exceeded well before reaching its salinity threshold of 6.0 dS/m. The above thresholds are values published by the America Society of Civil Engineers (Agricultural Salinity Assessment and Management, Kenneth K. Tanji (editor), 1990).

CVRWQCB-17

Concerning Site H and future sampling at a more appropriate location, the comment is noted and options to be suggested will be considered.

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